IPCC WGI SR15 Second Order Draft Review Comments And Responses - Chapter 3

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1334					The chapter is on impacts of 1.5°C vs current and, ideally 2°C impacts. That's what the focus should be on. Unfortunately, the reader is left with the perception that this is something like an IPCC AR light that tries to be comprehensive. This is not only missing the purpose of the report - which is to provide decision makers with a good understanding of what is at stake - it is leading to the important questions not being presented in a more accessible way. The authors should realize that the report is not meant to reflect the entire complexity. Specialist journals are better placed for that. Instead, the report should provide a short overview of what is at stake, summarize the important findings of what has happened so far and then provide clear information as to how impacts will differ at 1.5°C and 2°C (or anything close by to cast a wider net for relevant information). It will be the difficult task of the chapter and sub-chapter lead authors to determine what needs to be there and what needs to go and enforce this. Overshooting by more than 10% to 15% is not acceptable! A possibility to keep the important references that cannot be reflected in the text is to provide tables in the Annex that contain that sort of information so that interested readers can follow up on questions (eg for specific regions, etc). [Karen Olsen, Denmark]	Accepted. The chapter was sharpened in the suggested way.
1336					All sections of the chapter (and potentially other chapters as well) should be structured in a similar way. This will enable reading and understanding the text. Sections should briefly describe the system and what is at stake. [Karen Olsen, Denmark]	Accepted. It has been taken into account as much as possible.
1384					All subsection summaries should be deleted [Karen Olsen, Denmark]	Rejected. The subsection summaries are needed for clarity and transferability to the executive summary and the SPM
4486					Throughout this chapter, it is not clear the difference of impacts between 1.5 world and 2 degree world. There are many verbal explanation about the difference between two worlds but it lacks numerical comparison. I know it would be rather hard to compare the two worlds' impact in monetary terms, yet there should be some numerical comparison in other aspects such as number of persons at risk etc. For policymakers they need to compare the two world with cost and impact (risk, or benefit). Without any such numerical figures of impact in the two world, decision making would be very hard for policymakers. [Mitsutsune Yamaguchi, Japan]	We agree that better quantification of the difference is desirable, however we are guided by the available literature. We think that as more literature becomes available the chapter will be able to provide additional numerical comparisons.
6152					All sections of the chapter (and potentially other chapters as well) should be structured in a similar way. This will enable reading and understanding the text. Sections should briefly describe the system and what is at stake. [Anne Olhoff, Denmark]	Accepted. It has been taken into account as much as possible.
6200					All subsection summaries should be deleted [Anne Olhoff, Denmark]	Rejected. The subsection summaries are needed for clarity and transferability to the executive summary and the SPM
6980					General Comment: West Asia is one of the areas that are heavily affected by Global warming. Even global warming may have experienced a 1.5 degree increase in some places. So it's the best to focus on these areas as high-risk areas. Therefore, it is suggested that high risk areas such as the Mediterranean, West Asia, and North Africa be explored in a separate session. [maryam karimian, Iran]	High risk areas are embedded in specific sections and some areas additionally in boxes to show interlinkages between climate impacts and regional relevant topics.
7000					1.50C global warming shall impact negatively on food systems particularly in the sub-Saharan Africa region where about 70% rely on local rain-fed subsistence agriculture for food production. So, this is particularly important with issues relating to hunger, poverty, nutrition and health, migration, security, conflict and low adaptive capacity. Most importantly meeting the SDGs target may be a challenge. [Chizoba Chinweze, Nigeria]	We thank the reviewer for the comment. We have partly rewritten the chapter, improving the section of food security in which we treated all these aspects. However, food security has been mainly merged into Cross chapter box focused on Mekong basin. Currently, due to formatting, is not possible to expand more this section.
7078					pre-industrial period is written in different ways; should be unified [Dmitry L. Musolin, Russian Federation]	Editorial - copyedit to be completed prior to publication
7326					Sections 3.4.2.2 refers only to the studies that take into account anthropogenic impacts, but these studies combine hydrological impacts with anthropogenic impacts and this section should therefore taken into account the hydrological impacts in Section 3.3.5. Similarl for Section 3.4.9.4 [Chantal Donnelly, Australia]	Taken into account. Text revised taking into account the combination among section 3.3.5 and 3.4.9.4.
9164					General Comment: West Asia is one of the areas that are heavily affected by Global warming. Even global warming may have experienced a 1.5 degree increase in some places. So it's the best to focus on these areas as high-risk areas. Therefore, it is suggested that high risk areas such as the Mediterranean, West Asia, and North Africa be explored in a separate session. [Rahele Modirian, Iran]	High risk areas are embedded in specific sections and some areas additionally in boxes to show interlinkages between climate impacts and regional relevant topics.
14120					The whole chapter illustrates the impacts of 1.5 ? temperature rise with case studies of vulnerable communities and developing countries. The influence of the report would be more maximized if the author group can add some case studies happening in developed countries. This is to make developed countries know the impacts are globalized and it is neccessary to take more climate actions together with developing countries. [Zhen-Yi Wang, China]	Accepted. Examples of developing countries are presented in the report, specially in the chapter's boxes.
18536					General comment: structure All sections of the chapter (and potentially other chapters as well) should be structured in a similar way. This will enable reading and understanding the text. Sections should briefly describe the system and what is at stake. [Andrea TILCHE, Belgium]	Accepted. It has been taken into account as much as possible.
18538					All subsection summaries should be deleted [Andrea TILCHE, Belgium]	Rejected. The subsection summaries are needed for clarity and transferability to the executive summary and the SPM

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6150					• The chapter is on impacts of 1.5°C vs current and, ideally 2°C impacts. That's what the focus should be on. Unfortunately, the reader is left with the perception that this is something like an IPCC AR light report that tries to be comprehensive. This is not only missing the purpose of the report - which is to provide decision makers with a good understanding of what is at stake - it is leading to the important questions not being presented in a more accessible way. The authors should realize that the report is not meant to reflect the entire complexity. Specialist journals are better placed for that. Instead, the report should provide a short overview of what is at stake, summarize the important findings of what has happened so far and then provide clear information as to how impacts will differ at 1.5°C and 2°C (or anything close by to cast a wider net for relevant information). • It will be the difficult task of the chapter and sub-chapter lead authors to determine what needs to be there and what needs to go and enforce this. Overshooting by more than 10% to 15% is not acceptable! A possibility to keep the important references that cannot be reflected in the text is to provide tables in the Annex that contain that sort of information so that interested readers can follow up on questions (eg for specific regions, etc). • The main focus of the chapter is to identify and explain differences in impacts between 1.5°C and 2°C. The impacts should be quantified to the degree possible and presented clearly. Figures should be modified so that differences are intuitively understandable. Where there are no significant differences this should be stated, because from a policy perspective the big question is: what would it cost more to achieve the 1.5°C goal and what would the impact costs be if humanity did not reach the target? The authors need to make this question much clearer in the text. • The biggest challenges will probably lie in areas that are vital for food security, such as marine ecosystems that will be heavily affected at 2°C, and where 0.5°C additional warming across the globe might mean the difference between life and death for thousands of people. Similarly, costs to infrastructure due to flooding or sea level rise need to be quantified and presented clearly. The overall message is: show the differences, explain what they mean for ecosystems and humans, and quantify the costs. • The different scenarios being used in the chapter are not well described. In my view this is the only component needed for the methodology section in chapter 3. Given the limited number of articles dealing explicitly with the differences between 1.5°C and 2°C, it seems okay to me to use scenarios that have other (probable) warming outcomes, eg RCP2.6 or RCP8.5, which are referred to frequently, or where the different global temperatures are reached at an earlier time than 2100. But the differences need to be described clearly in one place. • Overall, the information is not presented in an easily understandable way. Particularly in the section on the climate system there is too much jargon. There are a few exceptions, which I have highlighted in the specific comments in the spreadsheet, where the presentation is well done and which can serve as examples to follow throughout the rest of the chapter. • Overall, the information presented is often redundant and does not bring out the key messages clearly. Much space can be won without losing relevant content by ensuring key information is presented once only (and not in multiple places). [Anne Olhoff, Denmark]	Accepted. The Chapter was sharpened and your comment was taken into account as best as possible.
14122					Generally, the impacts are mostly "qualitatively" described. The arguments would be more convincing if they can be more "quanlitatively" or "monetarily" shown. For example, most people pay attention on how much money they would loss under climate disasters. It would be clear if the report can estimate a value of monetary loss regarding different impacts. [Zhen-Yi Wang, China]	Many thanks for the comment - accepted. It should be noted that peer-reviewed quantitative estimates of economic impacts of climate change under 1.5 vs 2 degrees C of global warming were limited at the time of the SOD, with only a few additional studies becoming available towards finalisation of Chapter 3. Nevertheless, Section 3.5.3 (regional economic benefits) and Section 3.5.2.4.1 (global aggregated economic impacts) have been significantly further developed since the SOD, and now states the projected economic impacts under 1.5 vs 3 degrees C of warming quantitatively, in terms of GDP, GWP and percentage changes in economic growth.
31486					In Chapter 3, please focus on the impact (WG2) issues, based on the solid foundation of the physical science issues (WG1). [Japan]	Accepted.
31488					Please specify the basis of the literature regarding Fig. 3.19, Fig. 3.23, Fig. SPM.2, Fig. SPM 3. It needs to be clearly indicated which articles are referred, and what is the level of agreement as well as evidence. In case of low agreement and limited numbers of supporting articles and/or evidence, please specify so with appropriate scale of confidence since IPCC rule reads the IPCC works by assessing published literature. [Japan]	Accepted: The two figures from Chapter three are now supported with appropriate and extensive literature.
31490					Please add more detailed and quantitative information on costs, benefits, impacts as it is useful for policy makers. [Japan]	Many thanks for the comment - accepted. It should be noted that peer-reviewed quantitative estimates of economic impacts of climate change under 1.5 vs 2 degrees C of global warming were limited at the time of the SOD, with only a few additional studies becoming available towards finalisation of Chapter 3. Nevertheless, Section 3.5.3 (regional economic benefits) and Section 3.5.2.4.1 (global aggregated economic impacts) have been significantly further developed since the SOD, and now states the projected economic impacts under 1.5 vs 2 degrees C of warming quantitatively, in terms of GDP, GWP and percentage changes in economic growth.
31684					Sec 3.3.7 final paragraph. This paragraph is poorly supported by references and is identical to the FOD draft version. I raised a number of comments with the aim being to improve it in the previous review and these have not been addressed. I repeat these comments below, together with several new more general comments, please address them since at present this paragraph does not meet the standard expected for IPCC. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been removed, and section 3.3.7 in the final version of the chapter focuses entirely on tropical cyclone attributes under 1.5 vs 2 degrees C of warming.
33576					The whole chapter is extremely large and sometimes did not address the issue of the differences between 1.5 vs 2.0. Sometimes reflects issues that were addressed in AR5 report. I recommend to reduce the chapter. [Abel Centella, Cuba]	Accepted. Chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
40136					Much of the information on page 3-8 of the Executive Summary restates findings in Chapter 1 ES with no reference links to that info. For example, terrestrial regions warm more than oceanic regions. There is no need to provide a stand alone, end to end summary in Chapter 3 - rather, rely on the other parts of the report to do their part and reduce this chapter considerably. [Ko Barrett, United States of America]	Accepted. The executive summary was rewritten.

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18534					General comments • The chapter is on impacts of 1.5°C vs current and, ideally 2°C impacts. That's what the focus should be on. The chapter should distinguish clearly between impacts attributable to climate change and those attributable to other drivers: prioritising the former and paying only limited attention to the latter. • Overall, the information presented is often redundant and does not bring out the key messages clearly. Much space can be won without losing relevant content by ensuring key information is presented once only (and not in multiple places). • The impacts should be quantified to the degree possible and presented clearly. Figures should be modified so that differences are intuitively understandable. Where there are no significant differences this should be stated, because from a policy perspective the big question is: what would it cost more to achieve the 1.5°C goal and what would the impact costs be if humanity did not reach the target? The authors need to make this question much clearer in the text. * The authors should realize that the report is not meant to reflect the entire complexity. Specialist journals are better placed for that. Instead, the report should provide a short overview of what is at stake, summarize the important findings of what has happened so far and then provide clear information as to how impacts will differ at 1.5°C and 2°C (or anything close by to cast a wider net for relevant information). • It will be the difficult task of the chapter and sub-chapter lead authors to determine how to reduce the chapter to within the agreed dimensions. A possibility to keep the important references that cannot be reflected in the text is to provide tables in the Annex that contain that sort of information so that interested readers can follow up on questions (eg for specific regions, etc). • The different scenarios being used in the chapter are not well described. In my view this is the only component needed for the methodology section in chapter 3. Given the limited number of articles dealing explicitly with the differences between 1.5°C and 2°C, it seems okay to me to use scenarios that have other (probable) warming outcomes, eg RCP2.6 or RCP8.5, which are referred to frequently, or where the different global temperatures are reached at an earlier time than 2100. But the differences need to be described clearly in one place. • Overall, the information is not presented in an easily understandable way. Particularly in the section on the climate system there is too much jargon. There are a few exceptions, which highlighted in the specific comments in the spreadsheet, where the presentation is well done and which can serve as examples to follow throughout the rest of the chapter. [Andrea TILCHE, Belgium]	Thank you for your comments. 1) The chapter was revised and focused on impacts on 1.5°C/2°C warming 2) The chapter is shortened and sharpened. 3) It has been taken into account and included in the chapter 4) The chapter was shortened without leaving out important information 5) The chapter was shortened and content moved to the annex. 6) The chapter builds on AR5, where the scenarios are explained. Specific pathways can be found in chapter 2 and in chapter 1, Cross Chapter Box 1. 7) The chapter has been written in a clearer language.
40132					This chapter is an entire assessment in itself. It contains much useful information but is far too long and overly comprehensive for a report that was to narrowly address the impacts at 1.5C. The authors have undertaken herculean work here to review the literature on so many topics, but almost universally the description of observed and attributed changes IN GENERAL dwarfs the information specifically projected impacts at 1.5C. Sometimes there are pages of description of literature on an impact for which there is nothing specific to note at 1.5C. It seems that the authors believe they had to include a discussion on every impact even if there is nothing much we can say about 1.5. This is a major problem for this report and the strict page lengths envisioned. But it is also a major dilemna for the main AR6 assessment report. The larger body of information is best saved for the AR6 main report and in that respect is useful work that can be passed on and used to inform that assessment. Here, please provide a targeted assessment of the literature with relevant findings at 1.5C rather than a recounting of all findings. This will shorten the chapter considerably. [Ko Barrett, United States of America]	Accepted. Chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
40134					The chapter needs to refresh itself with the IPCC guidance on the treatment of uncertainty. Because it is undertaken in some sections as a literature review, there is little attempt to summarize and assess confidence or likelihood to higher level findings. This is a fundamental problem with the chapter that must be fixed. Only one of the bolded statements in the Executive Summary have an associated assessment of confidence or likelihood, despite many offering significant predictions. Example: Large storms are expected to change with relatively small amounts of further warming. However, the underlying chapter section does not support this statement with any confidence and offers limited evidence. [Ko Barrett, United States of America]	Accepted. Confidence language is used throughout the chapter and likelihood statements (e.g. likely, very likely) are provided when there is high confidence in the assessment.
41470					Human Health : Refer : A Spatial Hierarchical Analysis of the Temporal Influences of the El Niño-Southern Oscillation and Weather on Dengue in Kalutara District, Sri Lanka, m Prasad Liyanage et al, 2016, International Journal of Environmental Research and Public Health , Dengue outbreaks is correlate with the ENSO condition, Dengue is more common in tropical region at present. If the El Nino frequency is high with the global warming, it will be impacted for health sector in future [Sri Lanka]	The associations between El Nino and health will be assessed in the AR6
45760					This chapter tends to read like a text book rather than trying to focus on specific issues that policy-makers may want information on. It is also way too long - a radical cull is needed. This will be difficult with the current fine-grained structure and hence some lumping of subsections may be needed. [Mark Howden, Australia]	Accepted. Chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
46482					Chapter length estimate is 87.0 IPCC pages (27.0 over the 60 page limit agreed by the IPCC panel). This estimate does not include figures, tables, references, FAQs, and cross-chapter boxes but does include chapter-boxes and main text and the executive summary. Please find areas of the chapter than can be edited down to reduce the length of the final chapter draft. [Sarah Connors, France]	Accepted. Chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
46616					Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Prescriptive language was replaced.
50962					Several references are missing the rank within the year (i.e 2016a or b or? ....) [Fatima Driouech, Morocco]	Editorial - copyedit to be completed prior to publication
50972					Some authors (reference papers) are cited more than 60 times in the chapter, (this seems paradoxical even if it concerns several papers). Is this because there is no other equivalent references to cite? [Fatima Driouech, Morocco]	Accepted. Citations and balance were revised.
51092					RFC 2- Extreme weather events : Fire is not an extrem weather event but can be a consequence of extreme weather/climate. Fire aspect is important BUT Please put it in a most appropriate place/section. [Fatima Driouech, Morocco]	Rejected. Wild/forest Fire is a hazard related to extreme weather conditions and should be discussed as a component of RFC2.
51094					3.4.3.5.1 Putting Alpin region with the Arctic seems littele bit strange (Big difference in size and impcats; global vs regional/local). If realy requiered, there is need to justify/explain very well this junction [Fatima Driouech, Morocco]	Agree - these have been split now into two sections
51096					Some subsections contains a summary and others no (example in section 3.3). For homogeneity it is better to put the same thing (summary every where our no summary every where), a summary per section is also faisible. [Fatima Driouech, Morocco]	Text was revised. We try to limit the summaries to the subsections were they were needed for traceability reasons.

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54190					Probably due to the text conversion to a pdf file, overall the document there are missing spaces between words. For example: P65-L3 "aredoublingin" for "are doubling in", P86-L15 "includesome" for "include some" or P89-L7 "mangroves(Burt et al., 2016;" for "mangroves (Burt et al., 2016;", P89-L29 "people(Bakun et al., 2015" for "people (Bakun et al., 2015" or P89-L37 "upwelling systems,but" for "upwelling systems, but" ... and so on. These are only some few examples among houndreds of the occurrence of such a general problem. The conversion to pdf must be carefully supervised to avoid this problem [Jordi Salat, Spain]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
54360					Many dates of publications are missing [Robert Vautard, France]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
54628					The reduction of habitats for adults or juveniles (e.g. nurseries) could be added here. Migratory species are affected by hypoxia extension. Benthic habitats such as (cold or tropical) coral reefs are nursery grounds vunerable to climate stressors. [Nadine Le Bris, France]	Accepted: text change to include these types of ideas.
54678					Sanchez-Vidal A, Canals M, Calafat AM, Lastras G, Pedrosa-Pàmies R, Menéndez M, Medina R, Company JB, Hereu B, Romero J, et al. 2012. Impacts on the Deep-Sea Ecosystem by a Severe Coastal Storm. Chin W-C, editor. PLoS ONE 7(1): e30395. doi: 10.1371/journal.pone.0030395 [Nadine Le Bris, France]	Thank you for the literature. Unfortunately, given space, not possible to include all suggested articles.
54710					throughout the text figures are not good quality and not easily redable [Qudsia Zafar, Pakistan]	Accepted. Figures have been improved.
56772					General comment on references - references are problematic throughout chapter. The references run into words throughout the whole chapter. [Cheryl Anderson, New Zealand]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
57080					thober et al. adapt all references when published [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
57096					adjust spaces along all documents before and after references paratheses [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
57098					adjust submitted document references by adding "submitted" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
57692					Text needs careful editing for typos and sentence structure. Likelihood and confidence terms need to be written in italics [Hans Poertner, Germany]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
60242					This chapter is way too long: 190 pages (excluding references), three to four times longer than the page allocation in the approved outline. There are far too many grammatical mistakes and typographical errors to have this be considered a credible first draft. Also references are not cited in a consistent way. In some cases abbreviations are not described before they are used. It is blatantly obvious that the chapter has not undergone a single edit by either chapter leadership or the TSU. One wonders if anyone has read it from start to finish, or if it was just pasted together to be sent out for review. [United States of America]	Accepted. Chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
60244					The flow and the organization of the whole chapter should be reconsidered. For instance, to understand the impacts of 1.5 vs 2°C changes, very few new simulations are done. [There are exceptions of course like the HAPPI ones.] Much of the work in this chapter relies on work already done for the AR5. If so, one should briefly summarize the AR5, then talk about the new highlights and insights described in papers published afterwards. [United States of America]	Accepted. AR5 summaries were deleted.
60246					Some bullets can be combined to reduce length. For instance 10-13 and 34-39 can focus on the Mediterranean region. Having too bullets/highlights takes away from the crux of the material. [United States of America]	Chapter was considerable shortened and text has been merged.
60248					The manner in which previous work is referenced is very uneven. Some paragraphs cite work within the sentence, and some dump 20 or 30 citations at the end of a paragraph. [United States of America]	Accepted. The text has been homogenized as good as possible.
60250					Section 3.4.4.2.3 lists carbon uptake as a key ecosystem service. But heat uptake is never mentioned in the entire section – or in any section on ocean processes. Heat uptake might be the most important "service" provided by the ocean during the 21st century. The robustness of oceanic heat uptake rate in the decades to centuries ahead should be discussed. [United States of America]	Agreed but it is implicit in the overall set of questions posed with respect to climate change. The mention of carbon uptake specifically involves systems that are likely to change due to the impact of climate change upon them.
60252					There are many instances of confidence levels, especially in the Executive Summary, that are not italized while others are. [United States of America]	Accepted. This has been improved.
60254					Per the agreed outline, this chapter was supposed to be no more than 60 pages. It is currently 248 pages. Please reduce the overall length, in particular by focusing on impacts specific to 1.5°C scenarios (or different than 2°C scenarios), rather than general discussions. [United States of America]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given. To be considered: Normal page size= 500 words, IPCC pages=950 words
60256					Very surprised that the chapter does not have a major section on Energy. It covers water very well and also food and health and tourism etc. However, in considering the basic needs of developed and developing countries, energy is very likely to be impacted in many ways, and those impacts interact with other sectors in very important ways. Was energy omitted from the entire report or just this chapter? Note that higher temperatures certainly will have implications on energy demand, and changes in water (rainfall) could have dramatic impacts on energy production, and all of these interact to affect food systems. It seems to be a major omission. [United States of America]	There is a section on energy in Key Economic Sectors. The section assessed the literature on the risks at 1.5 and 2C.
60258					The chapter has a lot of typos, specifically words that appear together, while they should be two different words (e.g., toits = to its). [United States of America]	Editorial - copyedit to be completed prior to publication
60260					Need a bit more discussion of potential evolutionary processes. There are very few references to these processes in the chapter, even though a number of studies have started to investigate it more or less explicitly (e.g., Macel et al., 2017). Also, mentioning the effect of climate change on interactions between organisms would be really good (e.g., IPBES Deliverable 3(a)). [United States of America]	Agree, interactions and evolutionary processes are now mentioned in section 3.4.3.2, and also in the context of coral reefs (section 3.4.4.10). Macel et al. 2017 has been cited.

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60262					The issue of food security on the African continent is expertly addressed in "Climate Change and Sub-Saharan Africa: Agriculture and Food Security Nexus", by Chizoba Chinweze of Nigeria. This chapter may benefit from including her findings, which also provide an overview of the status of food security for the 800 million inhabitants of Sub-Saharan Africa (SSA), 70% of whom rely on local agriculture for their sustenance. Climate change and, in particular, variability in rainfall amounts could have catastrophic results for SSA's 2,455 million hectares (mha), 173 mha of which are currently under cultivation, as (1) approximately 97% of all crop land is rainfed and (2) 43% of SSA's land mass is already composed of arid and semi-arid agro-ecological zones. Moreover, agriculture is SSA's most important economic sector, representing 70% of the labor force and 35% of the gross domestic product (GDP). Factors exacerbating climate change in SSA include endemic poverty, hunger, high prevalence of disease, chronic conflicts, low levels of development, and low adaptive capacity. The confluence of these conditions can lead to dramatic swings in food prices as well as personal incomes. Finally, the author concludes that more concerted investments must be made and climate risk management strategies implemented, if related United Nations Sustainable Development Goals (SDGs) are to be met. [United States of America]	We thank the reviewer for the comment. We partly have rewritten the chapter, improving the section of food security in which we threatened all these aspects. However, food security has been mainly merged into Cross chapter box focused on Mekong basin. Currently, due to formatting, is not possible to expand more this section.
60264					The chapter would benefit from a careful copyedit. For example, the first sentence of the last key finding (lines 21-22 of page 13) is confusing, and can be interpreted to mean several different things. "In mitigating costs associated with climate change impacts on many nations, food production is a key factor for consideration." [United States of America]	Accepted - Text was revised with the suggested edit
60266					This chapter is excessively long and could be greatly improved by removing redundancies and focusing only on areas where differences between 1.5 and 2°C are significant. If there is not peer-reviewed literature describing the difference in impact for a given topic or sector, then general information on climate impacts to that topic or sector should be described in AR6, not this report. Several topics and key findings are redundant to, and more appropriate for, other chapters. For example, the key finding on page 3-8, lines 28-32, and those on page 3-9, lines 1-12, are more appropriately covered in Chapters 1 and 2, where already addressed. [United States of America]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
60270					Authors should be congratulated for the very significant work that has gone into this chapter. It is, for the most part, methodical, clear, and quantitative with regard to 1.5°C, and the differences between 1.5 and 2°C. With that said, the chapter is excessively long. The length could be addressed by trimming background material before the discusssion turns to points that are specific to 1.5°C (much of this material might be better reserved for AR6) and by reducing numerous redundant sections; the ending sections of the chapter, section 3.5 in particular, is very redundant with material that precedes it. [United States of America]	Thanks. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
62710					Overall, this chapter is *far* too long -- 190 pages of text plus another 60 pages of references! It is often written more as a literature review rather than an assessment. There is a crucial difference. The authors simply must revist the approach here, focusing on topics that really contribute to key messages that must be conveyed to policy makers, and critically assessing the state of knowlede on these topics, not trying to comprehensively summarize all the literature that has been written. References should be chosen to *represent* the body of literature. This chapter needs a lot of work to meet the expectations of an IPCC Assessment product. [Greg FLATO, Canada]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
60268					Strongly recommend that this chapter incorporate impacts of climate change on cultural heritage. Cultural heritage as used here includes archaeological sites, historic buildings and structures, cultural landscapes, museum collections and archives, along with traditional and indigenous knowledge and practices. These stand to be materially damaged in many ways as climate changes. Starting key references for this topic include: 1. Anderson DG, Bissett TG, Yerka SJ, Wells JJ, Kansa EC, Kansa SW, et al. (2017) Sea-level rise and archaeological site destruction: An example from the southeastern United States using DINAA (Digital Index of North American Archaeology). PLoS ONE 12(11): e0188142. https://doi.org/10.1371/journal.pone.0188142 regarding sea level rise and archaeological sites; 2. Matthiesen, H., Jensen, J. B., Gregory, D., Hollesen, J. and Elberling, B. (2014), Degradation of Archaeological Wood Under Freezing and Thawing Conditions – Effects of Permafrost and Climate Change. Archaeometry, 56: 479-495. doi:10.1111/arcm.12023 regarding effects of melting permafrost; 3. National Park Service Cultural Resources Climate Change Strategy (https://www.nps.gov/subjects/climatechange/culturalresourcesstrategy.htm) which includes a compilation of researched and observed impacts on cultural heritage across the 415 parks of the US national park system; and 4. Holz, D., Markham, A., Cell, K., and Ekwurzel, B. (2014). National Landmarks at Risk: How Rising Seas, Floods, and Wildfires Are Threatening the United States' Most Cherished Historic Sites. Union of Concerned Scientists, Cambridge, Massachusetts, which includes in-depth discussion of climate impacts on a selection of key cultural heritage sites across the US. This chapter briefly references the tourism impact of damage to cultural heritage, which is true and relevant, but cultural heritage provides more than tourism income. It is also important for maintaining cultural knowledge (both indigenous and non-indigenous communities), sense of identity and community cohesion, and aids in recovery following disasters. These topics are touched on as relevant in Chapt. 4 of this report. Cultural heritage is now recognized as a category of non-economic loss and damage in the UN Framework Convention on Climate Change Warsaw Mechanism for Non-Economic Loss and Damage. An important global-level document that includes the importance of cultural heritage and how to manage for it is the 2006 World Heritage Report No. 22, "Climate Change and World Heritage: Report on predicting and managing the impacts of climate change on World Heritage and Strategy to assist States Parties to implement appropriate management responses". [United States of America]	This topic will be covered in the AR6. The SR1.5 assesses literature on risks projected at 1.5 and 2C.
31074		26	117	26	The ability of fishing industries to adapt to these challenges is considerable although the economic costs of adapting can be high in terms of gear, fuel and infrastructure: reference needed here [James FORD, Canada]	We thank the reviewer for the comment. The chapter has been partly rewritten and many sentences were changed.
50974		32	27	33	What are the conclusions of AR5 and other papers regarding the trends in Africa? In all cases significat trends are detected in different african regions regarding the extremes (i.e. North Africa) [Fatima Driouech, Morocco]	With increasing global warming and compared 2071-2100 to 1961-1990, AR5 highlighted uncertainties and disagreement of models in Central Sahel, decrease f precipitation in the western Sahel (low confidence), increase of precipitation in Central Africa and East Africa with risk of floods (medium confidence) and decrease of precipitation in Southern Africa with high risk of droughts (high confidence). New literature brings more details on changes in the Sahel band and on changes in the precipitation extremes at 1.5°C compared to 2°C. North Africa is not included in this Sub Saharan box because this region is handled in the Mediterranean Box.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
3680					Chapter 3: I think this chapter is very long compared to IPCC AR5 chapters (which are typically 80-100 pages long). Too many details are present and the text could be considerably reduced if there is a stronger focus on changes at 1.5°C rather than a scan of all the existing literature since AR5 (which is more the focus of AR6). [David Docquier, Belgium]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
3724					From here, many spaces are missing. A problem when converting the format, I guess [Castor Muñoz Sobrino, Spain]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
165					There are many mentions throughout of the potential rate of future ice loss and ultimate fate of WAIS. These are often inconsistent. Some assert a potential timescale for loss of a large fraction of ice as millennial or multimillennial while other passages use century or multicentury scale. Part of the confusion is that WAIS is sometime specifically referred to, sometimes Antarctica as a whole, sometimes WAIS + Greenland together, etc. Each of these ice sheets could be characterized by entirely different time scales, with WAIS probably a faster rate than the others. Another source of confusion is an erroneous statement on the long term fate of WAIS on p. 63, lines 2-6 (see my comment on that section). A multimeter loss from WAIS on a timescale of a few centuries is within the bounds of current literature. I strongly urge that the various statements be made consistent and clear with respect to which time scales could apply to which particular ice sheet. Some of these statements are found at: p.9,lines+l26 29-30 and 48; p.63, lines 1-6, p.68, lines 21-25; p.172, lines 7-21, p.190, lines 14-15. [Michael Oppenheimer, United States of America]	Noted - revision for the FGD focussed on simplifying the discussion and removing inconsistencies
247					Fantastic amount of info in Chap.3. Could spend weeks reviewing it in detail but have run out of time and concentration to do so. Have only scanned chapter from p.59 onward with more time spent on review up to that point. Many readers - like myself - might get tired of working though all this material, much of which is often repeated several times. Writers and editors of this chapter (and other chapters) may be constrained by format established in previous reports and can't or don't want to try to condense this report. As stated, the info within is tremendous and very current but I hope that redundancy does not cause those readers who need to fully comprehend the critical information within to get lazy and not digest it completely. Hopefully, this will not result in continued apathy to the looming global disaster that will beset all of us if we don't take real action soon. [Paul Doyle, Canada]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
5512					This chapter could be improved by grater clarity and focus. For example, many of the figures are not understandable (eg the climate metrics being presented are not fully defined at a level that is understandable for the typical reader of this chapter), much of the chapter is not specific to 1.5, confidence of statement is often unclear or missing, and it is unclear if parts of the chapter are concluding something differnt (other than perhaps drawing on more recent literature) than the AR5. Greater focus on 1.5, and removal of parts not focused on 1.5 would allow for more space that could be used to clearly convey the basis for points. [Haroon KHESHGI, United States of America]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
6016					The authors are to be commended for compiling a vast amount of information and organising it in a manner that is readable. There are many nuances to cover with this issue, so this is a major challenge. My comments relate mainly to how the information is structured and how the main messages are portrayed. [Timothy Carter, Finland]	Thanks.
9372					In several places throughout the report, reference is made to placeholders for figures. In several places the authors indicate that recent literature will be reviewed and discussions, figures etc. (and conclusions in the chapter presumably) will be updated etc. It would seem that a great deal of new information and analysis will appear in the final draft which has not been subject to expert review. It would seem that further expert review would be required. [Sharon Smith, Canada]	The chapter has been updated with new literature and figures, which supports the former statements. Additionally an internal IPCC cross-chapter review was done.
9374					There have been other recent regional assessments that may be relevant to this chapter. For example, there have been a number of reports relevant to the Arctic published over the last year by the Arctic Monitoring and Assessment Program (AMAP). These include the update of the previous SWIPA report - Snow Water Ice and Permafrost in the Arctic 2017 as well as associated regional assessments for the Adaptations Actions in a Changing Arctic project (3 pilot regions included under this). These reports would provide information on observed changes, future changes and implications in terms of natural and human systems. [Sharon Smith, Canada]	Noted however scope for inclusion of these assessments is limited by the tight focus of this SR on 1.5/2.0 and space constraints.

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6018					The whole Executive Summary describes impacts as if they are driven by climate alone. This is in part a function of the scope of the chapter, which covers climate science and impacts and adaptation. I really think this is misleading for potential readers. Impacts are not commonly associated with climate system effects of anthropogenic forcing on climate and associated variables (except by climate modellers, perhaps). These are usually interpreted as drivers of impacts. Some potted version of Box 3.1 is crucially important at the start of the Exec. Summary. I started reading the ES forgetting the vast scope of this chapter (and I was in the Scoping Meeting!). I sympathise with the authors who have had a gargantuan task here. However, I fear that this wide scope is to the detriment of the messages. There is so much climate science to get through, that the importance of the impacts (which is arguably the core information necessitating human response and at the core of the UNFCCC, Article 2, and the Paris Agreement) is easily overlooked. I would be tempted to flip this chapter, relegating the underlying climate science to technical annexes and later in the chapter. The derivation of regional delta T is arguably of less importance for policy than the derivation of damage costs of that delta T. Both are needed scientifically, but policy makers may be more interested in the latter than the former. Moreover, one might argue that it would be quite reasonable to devote another two pages to describe socioeconomic developments of relevance under different 1.5 degC pathways. These have equivalent importance in analytical terms, are understood less, and hence have enormous uncertainties attached. The first section on "Interpreting 1.5 degC" really should be described differently, emphasising how socioeconomic development will proceed in parallel with (and as a key driver of) climate change. The assessment of risk in this chapter presumably draws on some estimates of changing socioeconomic conditions from SSP-based or SRES-based scenarios or using other assumptions of socioeconomic context. Even in their absence, common sense and expert judgement alone would suggest that they are important. The impacts of these changes on human systems are likely to be much greater than and more readily attributable than those of climate, given the low-end (by definition) magnitudes of climate changes projected. Then the time horizons and rates of change also become critical. Granted, other changes are mentioned after some headings (e.g. P9, L23-24), but the main sub-headings and the bold titles do not reflect this. Finally, I expect the authors rejoinder to all of this will be that the messages can be more effectively synthesised in the SPM. Yes, I agree, but this chapter really ought to stand alone too, and currently it is unbalanced simply because of the uneven weight of its content. This is not the fault of the authors; rather it is a problem of organising the cross-WG collaboration needed on the chapter. Without removing content, I wonder how much scope there is for moving the material around? That way, messages would emerge and details can be accessed, as required. Note that this comment began as a comment on the ES, but I now think it is more appropriate as a full chapter comment. [Timothy Carter, Finland]	Thank you for your detailed comment. The climate part of the chapter was shortened to reach a better balance between the sections.
9426					The designated page limit (about 60 pages) is dramatically exceeded. The chapter is currently 240 pages! [Russian Federation]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given. To be considered: Normal page size= 500 words, IPCC pages=950 words
9990					1-The chapter should focus on incremental impacts specific to the 1.5oC global warming against the 2.0oC, and supported by relevant literature generated specifically for the 1.5oC. 2-Feasibility and benefits of the 1.5oC global warming is not substantiated by specific scientific references developed for the 1.5oC global warming, while most of the references used in the Chapter 3 were not developed for the 1.5oC global warming. 3-The report focus mostly on CO2, diminishing the benefit of including all other GHGs 4-All outcomes of this chapter are based on simulation models subject to high degree of uncertainties. Wording should reflect this uncertainty: projected should be replaced by predicted or model predicted. 5-The report lacks specificity on the 1.5oC. Most of the conclusions are intuitive and assuming climate impact will be less severe when global warming is less, and don't provide scientific evidences on the why 1.5oC and what are the associated challenges and opportunities. [Saudi Arabia]	Thanks for your comments. Below the answers to the specific issues: (1) The focus of the chapter is 1.5ºC, presenting information comparing with 2ºC, when literature is available. (2) This issue is covered in CH4. (3) RCPs include the full basket of GHG. (4) Key findings are presented, including uncertainty. (5) Information presented is based on available scientific literature projecting the risks to human and natural system of warming of 1.5ºC and 2ºC above pre-industrial level.
10420					many opening sentences of individual sections cite one or several AR5 chapters which is important to show the continuity. However, I think it should be clearly stated that these are IPCC report chapters, hence assessment/review texts in itself to avoid giving the impression these were original studies that cover such the topic in such a breadth. in some sections this is done, in some not. so could be harmonised. [Christopher Reyer, Germany]	Accepted. This has been clarified throughout the chapter.
10526					The quality of many figures is quite poor, e.g. Figure 3.3, Figure 3.14, Figure 3.17, and Figure 3.21. More efforts are needed to improve the quality of these figures. [Hong Yang, Switzerland]	Accepted. Figures have been improved.
10528					Tables 3.1-3.6: No information is provided in these tables. It is not clear what messages these tables want to deliver. [Hong Yang, Switzerland]	Accepted. Tables were revised and information is included now in section 3.4.12 & in Annex of CH3 (S.4.4)
10538					Generally, the hierarchical structure of this chapter is too complex. There are five levels of subheading. The arrangement of section 3.4.7.3 is a good way to go. [Hong Yang, Switzerland]	Accepted. The hierarchical structure was rearranged to 4 level of subheading.
9992					The AR5 and the Coupled Model Inter-comparison Project (CMIP5) have not considered the impacts of 1.5°C vs 2°C global warming above pre-industrial levels. The Special Report 1.5 rely on a peer review scientific papers or experiments developed after IPCC/AR5 to quantify the impacts of 1.5°C vs 2°C. This approach should not be considered as systematic as the methodology used during the IPCC/AR5 report, since the derived conclusions from all the papers or experiments are based on different assumptions or inherited uncertainties of the methodologies used (i.e. spatial resolution, linear climate response etc.). Thus, the confidence level pertaining to the impacts of 1.5°C vs 2°C global warming is extremely challenging to be clearly quantified. [Saudi Arabia]	Rejected. The purpose of the SR15 report is to cover new material related to changes in climate at 1.5°C global warming, i.e. provide an update to AR5. By definition, it is not supposed to cover material from AR5. The post-AR5 literature available on changes in climate at 1.5°C and 2°C, and associated impacts, is now extensive and thus allows a robust assessment. The applied methodologies are well rooted in the literature. An extensive body of literature shows that the CMIP5 data base is suitable for most assessments of changes in climate extremes at 1.5°C and 2°C global warming. In addition, dedicated 1.5°C global warming climate model experiments (e.g. HAPPI experiments, single-model simulations) are available to provide comparisons with CMIP5-based analyses and constitute a substantial part of the chapter's assessment.
10556					In general, there are large numbers of minor and editorial mistakes in this chapter. A careful proofreading is necessary. [Hong Yang, Switzerland]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
21728					I presume it is too late to consider this comment but the truth is that I have found this chapter a bit lengthy and repetitive. My recommendation to the authors is to rearrange its structure or, at least, to shorter the text as much as possible. [LUIS VALDES, Spain]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.

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21730					I think is a principle that the IPCC reports should be based and supported by published (peer reviewed) literature (as stated in line 3 page 14); however, I noted that there are many (in fact too many) references without publication's year. I understand that these are papers submitted or in press. I think these should be removed unless the papers are already printed at the time of publication. [LUIS VALDES, Spain]	Accepted. For the final version of the chapter, only accepted papers have been considered. Additionally to peer reviewed paper, grey literature is used as well.
21732					I understand that it is difficult to avoid repetitions in expressing the differences in impacts between 1.5ºC and 2ºC, but expressions such as "will carry significant benefits" (line 26, page 10) could result in the false perception that a warming of 1.5º is a good thing. I think it is better (and closer to the proper message) to say that "1.5ºC will be much less damaging than that at 2ºC or more" (e.g., line 46, page 10) and this should be the rule/style to avoid misunderstandings/misperceptions to the reader. [LUIS VALDES, Spain]	Agreed. This will be adopted where appropriate. It will not be possible to avoid the word "benefit" completely.
21734					Although we are analyzing an average global warming of 1.5ºC, I think it is necessary to reiterate that such warming is far to be homogeneous and that, whereas some regions will remain below 1.5ºC, others will experience increases of several degrees and therefore impacts will be really different depending on the region. This aspect is treated in Cross-chapter box 3.2; but this box is in page 179, almost at the end, whereas this issue is missed in many of the subsections through the entire chapter. [LUIS VALDES, Spain]	Accepted. It has been taken into account in section 3.2.
29712					The relatively poor knowledge of deep-sea ecosystem functioning is however limiting the assessment of vulnerability (tipping points, cascades...). Retroaction on climate (i.e. by the emission of GHG, N20, CH4) and change on the carbon storage/nutrient processing capacity are to be considered. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted although change requested not quite understood.
29724					Factuals errors, approximation, and lack of data may feed the climate skeptical argumentary, they must be corrected if we do not want to see them twisted and use in the wrong way. (Comment by Guigone Camus) [Antoine PEBAYLE, France]	The authors agree with this general comments.
30424					Among extreme events are the wildfires. If available, add a paragraph in chapter 3 on the wildfires (precising the region where it will be dramatically increased, how much it will be increased at 2°C global warming compared to 1,5°C global warming...). [France]	Agree, section 3.4.3.5 now contains a more extended section on wildfire risks
30426					Typo: rewrite every "2.0C and "2.0°C" into "2°C" to be consistent throughout the Chapter [France]	Editorial - copyedit to be completed prior to publication
30428					There are many references to papers from Seneviratne who is one LA of the Chapter. CLA should insure that it does not lead to a bias in the assessment of related domains. [France]	Thank you. That was taken into account and citations and balance were revised.
37166					The relatively poor knowledge of deep-sea ecosystem functioning is however limiting the assessment of vulnerability (tipping points, cascades...). [Françoise Gaill, France]	The authors agree with this general comments.
37178					Factuals errors, approximation, and lack of data may feed the climate skeptical argumentary, they must be corrected if we do not want to see them twisted and use in the wrong way. [Françoise Gaill, France]	The authors agree with this general comments.
38646					It would be useful with some more focus on and justification for the time perspectives used; especially 2100. Some info is given on page 17, line 24-34, but i think more is needed, and earlier in the chapter. Also in the ES [Jan Fuglestvedt, Norway]	Rejected. The focus was on temperature change and when certain temperatures would be reached. For the framework and context of the report, see as well chapter 1.
40962					Congratulations on a job well-done. The discussion on avoiding tipping points by achieving global temperature goals and beyond the end of century implications despite the fact that the scientific literature specific to global warming of 1.5°C is only just emerging and also the limiytations associated with impact studies specific to this temperature goal, is very informative for policy makers. [Lourdes Tibig, Philippines]	Thank you for the comment. Since the SOD was formulated, it was also possible to somewhat refine the discussion on tipping points given the emergence of new peer-reviewed literature on the impacts of global warming under 1.5 vs 2 degrees C of global warming.
40964					Chapter 3 is the gist of the Special Report. The information on findings, especially in terms of observed and projected impacts and projected risks in natural and human systems at 1.5 vs. 2ºC leading towards avoided impacts and reduced risksat 1.5ºC compared with 2ºC, benefits of achieving these 2 limits, implications different pathways the former are what is vitally needed by policy makers.. Value of these information is immense. It is therefore imperative that conciseness, without sacrificing the technical content of the findings be the keystone of this chapter. [Lourdes Tibig, Philippines]	Thank you. The chapter was focused and refined.
40966					There is confusion in the presentation of definitions, approaches and findings. Often, it jumps from one to the other.It is also suggested that if the intention is to present current knowledge on observed impacts of changes in climate and weather, the AR5, and recent findings ater AR5 be the point of departure. [Lourdes Tibig, Philippines]	Accepted. The chapter was focused and already known knowledge was deleted.
44298					stabilisation or "stabilization"? [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
44300					Preindustrial or "pre-industrial" or "Pre-Industrial"? [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
44532					GHG or "greenhouse gas"? [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
44534					heat wave or "heatwave"? [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
44600					Spacing issue in many, many places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
44608					Year is missing in numerous references [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
45592					Chapter 3 needs strong editorial review as there are several words that are stuck together (i.e. 'changeinmost' instead of 'change in most' in page 77: line 22, and many others), repeated words (i.e. 'data are are less numerous' also in page 77: line 23, and many others), or difficult to understand sentences (i.e. page 104: lines 34-37, and others), which makes it hard to read the chapter. [Adela M Sánchez-Moreiras, Spain]	Accepted - Text was revised with the suggested edit
50790					IPCC SREX, WG1, WG2, AR5 should be explained once in the chapter [Amjad Masood, Pakistan]	Editorial - copyedit to be completed prior to publication
50946					In whole chapter, one very common mistake is spacing between two words. [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
50948					Another common mistake is closing missing of closing paranthesis at many places (mentioned at some places in the above comments) in the whole chapter. [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication

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49066					The chapter has not improved on some of the key issues that were already a problem in the FOD: # Structure: It's basically 2 chapters in one. One from WG1 and one from WG2. No integration whatshowever is achieved, even 'hot spots' and RFCs are presented side by side. This leads to a lot of repetition even apparent in the subsection headings (i.e. 3.5.5.1and 3.5.6.1 (and to some extend 3.5.2.1.2 that covers the same topic) and 3.5.5.6 and 3.5.6.5.). This renders the whole chapter close to unreadable and is very prone to errors. #The coverage of several key issues is insufficient. In particular the SLR sections are in very poor shape and do not accurately reflect the state of the current literature. Comments on the FOD on this issue have went unnoticed. This requires attention of the CLAs for section: 3.3.10, 3.4.4.1.7, 3.5.2.5.1, 3.6.4.2 # Usage of confidence statements appears to be erratic and to the authors discretion. The confidence of much more statements than currently can be assessed. Current use of language i.e. 'may' without confidence statement is not informative. [Bill Hare, Germany]	Accepted. Structure has been partly revised. Repetition has been avoided. Integration of WG1 and WG2 has been revised in tables. Issues were addressed in FGD. Language has been sharpened and confidence language has been introduced where possible. Comments on SLR noted however much of material suggested by the reviewer was not specific to 1.5C and felt more appropriate to SROCC.
49068					A central challenge for this chapter is how to discriminate between impacts for which GMT is a good or sufficient proxy, and impacts for which it is not. There is sufficient information available to clarify this for a range of impacts and indicators i.e. Extreme weather pretty good (Senerivatne et al. 2016 and forthcoming), time lagged systems like oceans and cryosphere not at all, biosphere not really, due to CO2 fertilisation effect. Clarifying this upfront will greatly improve the readibility of the following sections where this is a re-occuring issue and repeated over and over. Having this as a guiding narrative will greatly help to improve section 3.2. At the same time it can be a useful result for policy makers to know in order to assess risks by different pathways. I suggest either an extra box for this or an additional section. [Bill Hare, Germany]	The use of calibrated language for the level of confidence should capture this. If temperature cannot be demonstrated as a driver of change (because it is not related or the data are noisy or for other reasons of low reliability) then it will be reflected as lower confidence than those that are not.
50950					many references are unpublished or year of publication is missing [Amjad Masood, Pakistan]	Accepted. For the final version of the chapter, only accepted papers have been considered.
50952					there is no mention of glaciers those are stable or advancining/surging in the Karakoram Region according to some recent studies (Forsigth N. et al 2017, Bashir F. et al 2017, Kääb et al., 2015, Paul, 2015, Brahmbhatt et al., 2015. et al. etc.) alongwith the old studies like the Keneth Hewitt studies 2005, 2007 and 2011 etc. [Amjad Masood, Pakistan]	Noted - scope for including observations is very limited because of the tight space constrains and need to focus on 1.5/2.0C
53914					Chapter has progressed hugely well done. It remains hugely ambitious covering so much and chunks including important tables are still incomplete. I am concerned that some sections and figures in the final draft maybe below par, detracting from the excelence in the rest of the Chapter. I would suggestr you rationilize and simply delete some sections and planned figures/ tables. - you can leave things to AR6 [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]	Thank you. The chapter was sharpened and focused.
57570					please revise text, there are frequently spaces missing between words [Hans Poertner, Germany]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
57572					please check and revise citations in the text, often only name/s is/are given without status or publication year. Please also consider the cut-off dates for literature included in the report (submitted by 1 November 2017, accepted by 15 May 2018) [Hans Poertner, Germany]	Accepted - Text was revised with the suggested edit
57574					please ensure consisten use of acronyms; provide full term + acronym at first mention and use acronym only thereafter (e.g. GMSL) [Hans Poertner, Germany]	Accepted - Text was revised with the suggested edit
57582					be consistent in the use of acronyms, e.g. WG2 vs WGII vs Working Group II, AR5 vs 5th Assessment Report, … [Hans Poertner, Germany]	Accepted - Text was revised with the suggested edit
57700					It would help the report greatly if the rich information on observed and projected impacts could be used to identify key risks and to convert such information into illustrative figures and regional (key) risk tables to replace the placeholder figures and compilations on impacts in the Summary for Policymakers. AR5 key risk tables as in WGII SPM and figures in SYR might serve as a examples to extract useful elements for an assessment of relevant information for 1.5°C warming. [Hans Poertner, Germany]	Accepted. The burning embers diagram, included in the FGR, cover this.
57702					Regional information especially if comparative and of the same kind or for the same region could be placed into tables reporting regional impacts and risks and thereby help to reduce text (e.g. expanding on Table 3.7, adding graphic elements?). [Hans Poertner, Germany]	Accepted. The text and tables were revised.
57704					This is a great compilation with rich material covering diverse and relevant aspects including impacts of mitigation efforts. For a final draft restructuring for key observations and risks, combined with climate hazards, would be useful to streamline the chapter. [Hans Poertner, Germany]	Thank you. The chapter has been sharpened.
58560					The representation of the two-degree warming in the text should be standardised. In some places (page 73 line 46) it is given as 2 degrees C, but elsewhere it is given as 2.0 degrees C (e.g. page 73 line 47) [Paul Leahy, Ireland]	Accepted. Standardization will be done previous to publication.
62798					A discussion of the most recent literature on social cost of carbon (SCC) of climate impacts seems to be largely missing from the Chapter. Even though SCC estimates are not tied to a specific temperature target, they are relevant for the report, as those estimates can be compared to the marginal abatement costs of achieving 1.5°C assessed in Chapter 2. See Box 2.1 for details and references on relevant SCC literature. It would be great if a subsection on SCC could be added, and the assessment of the literature brought forward to Box 2.1. [Elmar KRIEGLER, Germany]	An assessment of the economic literature was added to the chapter.
9720					First of all, I would like to thank the CLAs, LAs, and CAs for their hard work and efforts to comprehensively cover the climate impacts related to a 1.5degC warmer world. In the following, I will focus mainly on the coverage of sea-level rise (SLR) related topics. [Alexander Nauels, Australia]	Thanks.
9722					There needs to be conistency in the spelling of SLR, i.e. using 'sea level rise' would be consistent with AR5 WGI CH13. [Alexander Nauels, Australia]	Accepted - Text was revised with the suggested edit
10290					General comment: It would be useful to quantify the effects of climate change: how serious injury is caused by the various impacts, how many people are affected negatively and what rate and scope of migration can be triggered. [Hungary]	Where the literature was available, these quantifications have been added.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
15796					There is some structural confusion in reading the chapter because of the way that particularly sections 3.3 (global and regional changes) and 3.4 (observed impacts...) split what is common information on these aspects. The chapter has a fragmented feel. It is a little unclear where some information on a given topic, e.g. sea-ice, should be placed, or what the real scope of a subsection in either 3.3 or 3.4 should be. The result is a tendency to some overlap, but more seriously to what appear to be gaps - as though topics (like Antarctic sea-ice change, which this reviewer found lacking) which are missing in one section were to be treated in the other. This separation may now be committed in the draft structure but editors/authors could now focus on a birds-eye view to ensure coherence, consistency, completeness and preferably some cross-referencing (which may allow for clearer treatment). The situation becomes even more fragmented, for example when a topic is touched upon from another perspective e.g. looking at framework organisms, like krill, in the sea-ice zone. It becomes hard to assemble a fully synthesised picture from the report. [Australia]	Thanks. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
15798					Suggest that observed and modelled changes and “impacts” should be presented in a clear structure. [Australia]	Thanks. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
15800					Suggest the chapter needs to more clearly reflect that not all impacts of a 1.5oC, or even 2oC warming will be negative. There are likely to be near-term benefits for some regions: increased plant water use efficiency in some semi-arid regions, longer growing seasons, more open water supporting more fishing in some Arctic waters, greater rainfall in a few areas. Having the chapter imply it's all bad for everyone everywhere risks the credibility of the report. [Australia]	Where the literature was available, these qualifications have been noted.
15802					Suggest this chapter should have a different title: "Impacts associated with 1.5C global warming …" to reflect that some of the impacts do not arise from the warming in and ot itself, but from the biogeochemical actions of greenhouses such as ocean acidification, plant fertilisation effect. [Australia]	Whereas the title of the chapter is unchanged the chapter text has been changed in places to make clear the differences noted.
15804					There is a severe lack of Southern Hemisphere perspectives, especially Southern Ocean and Antarctic. [Australia]	Information has been added in various places, where the literature was available.
17186					The entire Chapter needs a careful round of copy editing for simple editorial correctness and consistency. For example, there are many instances where an em dash is used instead of a hyphen, hyphenation of compound modifiers is haphazard and inconsistent, words like "hotspot" are also written "hot spot" or "hot-spot", there are many instances where spaces are missing between words (especially around citations), and the entire Chapter needs careful punctuation to avoid ambiguity. I will point out some of the grammatical issues, but will leave missing spaces, and proper punctuation to the CLAs and REs. [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
17188					The formatting of references is poor. In many places, brackets are incorrectly positioned; in others, publication dates are missing. [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
17244					The first mention of confidnce, agreement etc., is on Page 9, line 24. This language is used in a haphazard way to support statements/conclusions throughout the Chapter; it should be used wherever conclusions are drawn. [David Schoeman, Australia]	Calibrated language is now utilised throughout the chapter and in the ES
17306					This Chapter uses MANY different conventions in numbering points. For example, on Page 21, line 26, "a)" appears, but there are instances of "(a)", "i)", "(i)", etc., sometimes in the same paragraph. The notation needs to be standardised. [David Schoeman, Australia]	Accepted - copyedit to be completed prior to publication
17374					Not only are the extensive issues with grammar and punctuation in many sections (at times bad enough to make assessment of content difficult), but the style is variable throughout, also. [David Schoeman, Australia]	Accepted - Text was revised
28128					IPCC SREX found low or medium confidence for many projected changes in extreme events (e.g. SREX SPM section D), apart from temperature. To our knowledge, current literature does not give high confidence in projections of extreme events by GCMs, especially in terms of precipitation and related parameters such as river flooding, and especially for some regions - e.g. Africa. While the problem is acknowledged in the SR1.5 in principle, there is a wealth of details of projections given in chapter 3, e.g. 3.4.2.2, 3.3.3. We suggest to strongly shorten these sections, concentrating on results with medium to high confidence and to add progress since SREX/AR5 that would allow for meaningful assessment here. [Germany]	Noted. The SREX also highlights high confidence (likely) changes in heavy precipitation. For droughts, we have related the assessment to the AR5 and SREX assessments. For floods: THIS NEEDS TO BE ANSWERED BY INES
28130					Many sections in chapter 3 contain descriptions of observed impacts - sometimes for several pages (e.g. subsection 3.4.4.1). Please make sure to indicate whether these are different/additional to AR5. And check whether is it necessary to detail these again? [Germany]	The chapter has been considerable reworded, and we indicate clearly whether statements about observed impacts originate from the relevant AR5 chapter or from more recent literature
28132					We are very concerned about the current format, length and breadth of Chapter 3, and the resulting difficulty in identification and review of key findings. The chapter seems to repeat the structure of the AR5WGII report Part A, going through all systems and subsystems (but not regions), adding material from WG1 on climate system changes at 1.5C compared to 2C. The breadth and wealth of the information currently in the chapter is difficult to digest and synthesize into key findings relevant in the context of this report. Also, the quality and level of evidence varies strongly between sections. The authors may consider to focus more on differential impacts (where there is information available from the literature) and leave areas with little or inconclusive evidence aside. It would also be helpful to add references to the upcoming SR on Land and on Cryosphere and Ocean in the respective subsections. In order not to lose all the material that is not sufficient to underpin clear statements on differential impacts between 1.5 and 2 C, or impacts of 1.5C but is nevertheless considered relevant by the authors it may be useful to populate tables for different impact categories, and state the impacts considered on a more generic level, and add the references without the specific details (as done e.g. in WGIIAR4 Chapter 1; Rosenzweig et al., 2006). [Germany]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
28134					We are very concerned about the approach to update and amend key results of the AR5 as synthesis for Chapter 3, especially in the light of the current status of the analysis presented in the chapter. The placeholder figure for Figure SPM 3 suggests that a regional and sectoral risk assessment is planned as a key outcome of chapter 3. The AR5WGII regional risk figure has been produced during the AR5 process through a coordinated effort across regional and sectoral chapters, with a common framework and thorough review strengthening the expert judgment applied. It is currently unclear how this framework should be served by the outcome of Chapter 3, where regional key risks and risk reduction through adaptation are not discussed in a structured manner that would allow for such a far-reaching assessment to be adopted. Also, given the late stage of the process and the absence of a draft assessment in the SOD, this figure and the underlying assessment would not undergo expert review. In the light of the scientific integrity we would therefore strongly recommend to chose a different format for the synthetic representation of risks, and save updating this figure for the AR6. We have similar concerns regarding the update of the "reasons for concern" - graphic which are detailed in our comments to the SPM and to Figure 3.23. [Germany]	Accepted. Figure is not anymore included.

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28140					Throughout the Executive Summary, calibrated confidence language is missing. There are also comparatively few confidence statements attached to the chapter text, in particular within sections 3.6 and 3.7. It is therefore difficult for the expert and government reviewers to assess the significance of statements, and to judge whether they are deemed appropriate. This is a great concern also with regard to the synthesis products of the chapter that will not undergo another round of expert review. [Germany]	Calibrated language is now utilised throughout the chapter and in the ES
28144					General Comment: please check wording and grammar. Some sentences are very long and interlaced. Grammatical errors confuse the meaning of the statements. [Germany]	Accepted - Text was revised
28146					It might have been better to apply some sort of “Difference-in-Difference” analysis to illustrate the differences between a warming of 1.5°C and 2 °C. That is, comparing the difference between a 2°C-Senario and a Business-As-Usual-Scenario to the difference of a 1.5°C-Scenario and a BAU-Scenario. The results could then be interpreted much more easily and one would not run into the danger of the reader wrongly perceiving the 2°C-Szenario as reference-scenario that is about to be realized, which, however, is most likely not the case. [Germany]	The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given. Additional text and illustrative diagrams have been added to help make the identified differences between 1.5C and 2 C clear.
28136					We strongly support the approach of the authors to synthesize available information on differential climate changes and impacts and relevant thresholds between 1.5C and 2C warming along the principles of "Reducing hot spots of change for 1.5°C and 2°C global warming" (3.5.5) and "Avoiding regional tipping points by achieving more ambitious global temperature goals" (3.5.6). We would like to encourage the authors to consider a graphical representation of the main findings of these two sections, supported by other evidence as relevant, also with a view to a synthesis product for the Summary for Policymakers. We believe a balanced graphic representation of this format could also provide a valuable format in conjunction with the SDG analysis provided in chapter 5, which currently does not account for the benefit of avoided climate change, its associated risks and impacts. [Germany]	Thank you for the comment. We have considered this suggestion, but given the diversity of hot spots and tipping points in terms of their geographic distribution and the wide range of sectors being impacted, we have not attempted representing these aspects graphically. However, we have expanded on the use of "burning embers" diagrams, to elaborate on a range of "reasons of concern" through which the severity of a variety of risks are described as a function of the increase in the global mean temperature.
28138					We strongly feel that the important issue of long term (committed) sea level rise and possible thresholds within the Earth system related to that (e.g. West Antarctic Ice Sheet, Greenland Ice Sheet, irreversible melting of Glaciers…) that may be crossed with a greater likelihood between 1.5 and 2C are not discussed consistently and to the extent merited by this reports mandate. We urge the authors to include most recent evidence e.g. on stability thresholds in Antarctica, overshoot implications for committed sea level rise, and provide consistent information on the consequences of stabilization levels of 1.5C against 2C not only in 2100, but beyond. Please also add a reference to the forthcoming IPCC SR OCC. [Germany]	Accepted - we have substantially revised the long-term part of section 3.6 and moved relevant material from elsewhere (eg 3.3) in the chapter to this section
28142					General comment: We acknowledge the great work done by Settele et al. 2014 in AR5. However, please consolidate your discussions by adding more newer results and references in the subsections 3.4.3.1, 3.4.3.2, 3.4.3.3, 3.4.3.4, 3.4.3.5.1 ,3.4.3.5.2, 3.4.3.5.3. These should be included as these sections should rely on a broader assessment of available information. Also, in section 3.4.3.5.3 page 83 line 20, you are referring to Settele et al., 2014, although Settele et al., 2014 are actually citing Breshears, 2016. It may therefore also be useful to refer to the original author/publication and to re-check the content of the citation with the original text. [Germany]	The chapter has been considerable reworded, and we indicate clearly whether statements about observed impacts originate from the relevant AR5 chapter or from more recent literature. More new literature has now been included as you suggested.
30860					My generall impresion is that all urban issues are covered in a very superficial and general way in this Chapter, and that coordination with Chapters 4 and 5, in which urban issues are also underdeveloped, is required. The literature review is inconsistent, i.e. little references are writen as global statements are written based on little and very specific references. In other occasions snapshots of information are presented with an unclear logic. [Érika Mata, Sweden]	Taken into account-text revised to enhance coherency and consistency.
33076					The inequitable distribution of climate impacts needs to be addressed - especially in terms of the people that are most affected and why. [Tara Shine, Ireland]	This topic will be covered in the AR6. The SR1.5 assesses literature on risks projected at 1.5 and 2C.
35858					More clarity is required on what would be the impact of anthropogenic chemical and physical intervention methods used for GHG mitigation [for e.g. solar radiation management (SRM) / stratospheric aerosol injection (SAI)] on regional and global climate. This is a potential area of research and demands further understanding of atmospheric processes and therefore should be included in section 3.7 [India]	Rejected. This question is addressed in the cross-chapter box on SRM in chapter 4 of the SR15 report.
33072					While this chapter looks at the impacts of climate change on food, water, livelihoods etc. - it does not look at the impacts on human rights (including for example the right to food, to water, to health, to a livelihood). A section is needed which examines the impacts of 1.5oC on human rights. Useful references include the UNEP publication on Human rights and climate change (2015) and Robinson, M. & Shine, T. (submitted) Achieving a climate justice pathway to 1.5oC. Nature Climate Change. Mary Robinson Foundation – Climate Justice (2015a) Right for Action: Putting People at the Centre of Action on Climate Change. Available online at https://www.mrfcj.org/wp-content/uploads/2015/11/MRFCJ-Rights-for-Action-edition-2.pdf Mary Robinson Foundation – Climate Justice (2015b). Zero Carbon Zero Poverty the Climate Justice Way: Achieving an equitable phase-out of carbon emissions by 2050 while protecting human rights. Available online at https://www.mrfcj.org/pdf/2015-02-05-Zero-Carbon-Zero-Poverty-the-Climate-Justice-Way.pdf Hint - pick up on the literature used in chapter 1 [Tara Shine, Ireland]	This comment is passed to Chapter 5. Chapter 3 only reviews impacts at the natural and human system at the global and regional level specific on 1.5/2 degree C. The implications for SD (including human rights) is discussed in chapter 5

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33074					The chapter makes NO references to the gender differentiated impacts of climate change. This is a serious omission. There is a literture to draw on. E.g. e.g. Social dimensions of climate change: equity and vulnerability in a warming world. Mearns, R & Norton, A. (2010). World Bank (Chapter 5 on gender); The Full View: second edition (2016) Mary Robinson Foundation and UN Women. https://www.mrfcj.org/wp-content/uploads/2016/11/MRFCJ-Full-View-Second-Edition.pdf; Turning Promises into Action – Gender Equality in the 2030 Agenda for Sustainable Development. UNW / UNDP (SDG 13 on page 119) http://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2018/sdg-report-gender-equality-in-the-2030-agenda-for-sustainable-development-2018-en.pdf?la=en&vs=948; Routledge handbook of gender and environment. MacGregor, Sherilyn, 1969- editor. Book. English. Published Abingdon, Oxon; New York, NY: Routledge, 2017. https://capitadiscovery.co.uk/dcu/items/930587?query=gender+and+climate+change&resultsUri=items%3Fquery%3Dgender%2Band%2Bclimate%2Bchange Gender and climate change. Rebecca Pearse. Wires Climate Change. First published 28 December 2016 Gender and Climate Change in Latin America: An Analysis of Vulnerability, Adaptation and Resilience Based on Household Surveys. Authors Lykke E. Andersen, Dorte Verner, Manfred Wiebelt. First published: 17 October 2016. Journal of International Development Climate change vulnerability, impacts, and adaptation: Why does gender matter? Fatma Denton. Pages 10-20 | Published online: 01 Jul 2010 Journal – Gender and Development THE OUTBURST: Climate Change, Gender Relations, and Situational Analysis Nielsen, Jonas ØstergaardAuthor InformationView Profile. Social Analysis; Oxford Vol. 54, Iss. 3, (Winter 2010): 76-89 [Tara Shine, Ireland]	This comment is passed to Chapter 5. Chapter 3 only reviews impacts at the natural and human system at the global and regional level specific on 1.5/2 degree C. The implications for SD (including on gender) is discussed in chapter 5
46346					Migration is mentioned 136 times in the chapter (including biblio) and "Displacement" 35 times it might be good to define both terms and to include them in the glossary. Nb. The SPM does not mention "Migration" but only "Displacement". The same definition should be used in chapter 5. [Etienne Piguet, Switzerland]	Definitions of migration and displacement are both listed in the glossary.
49070					General comment on the chapter: the language must be carefully chosen when it comes to distinguishing the impacts of climate change and socio-economic drivers. This is also very important in order to understand the nuances in the trade-offs and benefits arising from different scenarios that lead to a same given temperature target. [Bill Hare, Germany]	Accepted. The language has been revised.
52820					This chapter could benefit from more graphs, particularly on impacts on natural and human systems. Some graphs on examples of avoided impacts are included in Chapter 5 and such graphs could be used in Chapter 3, section 3.5 [Iulain Florin VLADU, Germany]	Chapter graphics have been modified and additional figures (Reasons for Concern) added.
57638					This chapter is very difficult to read, there are numerous small sections presenting the latest literature on topics but little integration of the findings, resulting in repetition among sections. The authors should consider how to summarise and present information in easily understandable forms eg through figures, and tables. The detail in Sections 3.3 and 34 could be reduced and synthesised. I also refer the authors to the scoped bullets points where the emphasis is on impacts, risks and adaptation [Hans Poertner, Germany]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
62066					This chapter is well structured and it's scientifically based to assess changes in the climate under 1.5°C.The structure of the chapter is well explained in (Figure 3.1) to reflects the emphasis on 1.5°C and outlines the scope of the chapter with respect to emphasize that climate is an integrated part of the lived experience in the natural world and for humans. I congratulates authors of this chapter presenting a challenge with respect to cross disciplines and to promote clarity of terminology (Risk, Impact). Finally, I have two suggestions: First one, to develop a sub-section about observed and projected impact on agriculture sector under the section of key economic sectors (p128). Second one, is to add a sub section about observed and project impacts on soils as ecosystems under food security section (P 112). [Rachid MOUSSADEK, Morocco]	The chapter was reorganized so the assessment related to agriculture and food security is in one place. We were unable to identify literature on projected impacts of warming of 1.5 and 2C on soils.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62576					Unfortunately this chapter seems still to suffer from the attempt to write a mini AR6 WGII assessment. The chapter should have started with AR5 SYR SPM.10 figure and the supporting SPM 2.3 section (IPCC, 2014a). Particular attention should then have been given to the missing information re 1.5°C with respect to the 5 RFCs and the 102 assessed key risks (e.g. AR5 SYR AR5 FIgure SPM.8, IPCC, 2014a). The focus should have been on the underlying material from AR5 WGII report, notably Assessment Box SPM.1 (IPCC, 2014b) where any discussion of 1.5°C is missing and no comparison between the 2°C and 1.5°C limit is well supported. The latter comparison should merely attempt to assess where, which impacts could be avoided to which degree if policy makers would strengthen the limit from 2°C to 1.5°C. Tables such as SPM.2 Table 1 (in Assessment Box SPM.2, IPCC, 2014b) as well as Table TS.4 (Field et al., 2014) all have assessed only the Present, Near term (2030-2040), and Long term (208-2100) for 2°C and 4°C, but not for 1.5°C. That is the gap this chapter should fill, only this gap. This chapter should should refrain from reassessing the impacts at 2°C, i.e. attempting to update AR5 with latest literature (but you wirte so, e.g. on page 14, line 6). This chapter should focus on providing only the missing elements for 1.5°C in an attempt to complement the risk assessment done by AR5 WGII (IPCC, 2014c,d). The subsequent material of the chapter should then merely support and back up the complementing assessment and discuss where current scientific understanding makes this possible and where not. Notably the difference between 1.5°C and the present (~1°C) as well as (2°C) is to be discussed and uncertainty estimates should allow the reader to learn wbether current scinece is able to tell a siginificant difference or not by sector and regions (but emphasis should be on the difference between 1.5° and 2°C). This should all be done within as little space as possible. A starting point would have been a linear interpolation between present and 2°C (long term) as done by AR5 WGII or some pattern matching etc. (depending on what is actually available in the literature), again the starting point would be best the 5 RFC, notably Figure 19-4, and Table 19-4 (all from Oppenheimer et al., 2014) in the attempt to complement chapter 19 inasmuch as it has not been able to inform the Assessment Box SPM.1 for 1.5°C impacts. The current chapter 3 of SR1.5 is way too long and seems to attempt to cover too much material while failing to explicitly latch on AR5 (IPCC, 2014c,d) and merely fill in the gaps of AR5 re 1.5°C impacts. This is what policy makers expect according to my experience as co-facilitator of the Structured Expert Dialogue (Fischlin et al., 2015; Fischlin, 2017). They are willing to wait for AR6 for a full-fledged impact assessment. However, they need a report useful in aforementioned sense for the facilitative dialogue, that will take place right after publication of SR1.5. In short: Focus on providing answers to the queston: What can be gained in terms of avoided impact by strengthening the warming limit from 2°C to 1.5°C? Remove any text that does not help to answer this question (save it for AR6). Cited References: ---------- IPCC, 2014a. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. In: Core Writing Team, Pachauri, R. K. & Meyer, L. A. (eds.)Cambridge University Press: Cambridge, UK. 151. (http://www.ipcc.ch/report/ar5/syr/) Ip096 IPCC, 201b4. Summary for policymakers. In: Field, C. B., Barros, V. R., Dokken, D. J., Mach, K. J., Mastrandrea, M. D., Bilir, T. E., Chatterjee, M., Ebi, K. L., Estrada, Y. O., Genova, R. C., Girma, B., Kissel, E. S., Levy, A. N., MacCracken, S., Mastrandrea, P. R., & White, L. L. (eds.). Climate change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press: Cambridge, UK and New York, NY, USA. 1-32. (http://www.ipcc.ch/report/ar5/wg2/) Ip076 Field, C. B., Barros, V. R., Dokken, D. J., MacH, K. J., Mastrandrea, M. D., Bilir, T. E., Chatterjee, M., Ebi, K. L., Estrada, Y. O., Genova, R. C., Girma, B., Kissel, E. S., Levy, A. N., MacCracken, S., Mastrandrea, P. R., White, L. L., Field, C. B., Barros, V. R., MacH, K. J., Mastrandrea, M. D., Aalst, M. v., Adger, W. N., Arent, D. J., Barnett, J., Betts, R., Bilir, T. E., Birkmann, J., Carmin, J., Chadee, D. D., Challinor, A. J., Chatterjee, M., Cramer, W., Davidson, D. J., Estrada, Y. O., Gattuso, J. P., Hijioka, Y., Hoegh Guldberg, O., Huang, H. O., Insarov, G. E., Jones, R. N., Kovats, R. S., Lankao, P.	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
606	1		248		The second version has improved greatly in quality and many sections have benefited from having more comprehensive descriptions on the topics. However, it looks to me that it has been written quickly fast and the authors did not have enough time to proofread it: missing spaces, spelling mistakes, missing references or incomplete (many of them are just a name...). In addition, as I have highlighted in my previous review, this report is unbalanced, with an excessive focus on marine ecosystems but very little is said about terrestrial ecosystems beyond agricultural impacts of productivity and food security. This is also obvious in the references list, the number of references to coral reefs compared to soils is a poorly. As as soil scientist I can only feel fustrated about the fact that once again these policy reports pay very little attention to one of the biggest C sinks, that very little thought is given to one of the ecosytems that have been holding C for millenia (peatlands) and that the implications of warming on these vulnerable ecosystems should be a priority if we aim for more realistic predictions of Climate Change. [Maria Jesus Iglesias Briones, Spain]	Thanks.
668	1		248		I think the whole chapter is very good and offers and thorough study, including relevant studies and many recent literature. Again, because of my field of expertise, I miss more references to soils and soil biodiversity. I would also like to draw you attention on the Global Soil Biodiversity Atlas (https://esdac.jrc.ec.europa.eu/content/global-soil-biodiversity-atlas). In chapter V potential threats to soil biodiversity, including climate change are discussed. [Maria Jesus Iglesias Briones, Spain]	Soil is mentioned in the context of carbon storage. We did not find any information about soil biodiversity that related well to our chapter, which is about estimating risks at 2C warming versus 1.5C. For this reason, and owing to space constraints, a discussion of soil biodiversity has been left for AR6.
2388	1		3		Points in Executive Summary too numerous and repetitive [Debra Roberts, South Africa]	Executive Summary has been revised.
2392	1		187		While progress has been made in providing the reader with a roadmap for the chapter, the length and level of detail provided overwhelm the reader and obscure the storyline. This will make it very difficult for any policy maker to identify the key messages. [Debra Roberts, South Africa]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
2394	1		187		Although there is a strong urban thread throughout the chapter there is no significant consideration given to the high levels of informality that characterise urbanisation in the global South and how this might influence the impacts experienced under 1.5 and 2 degrees. [Debra Roberts, South Africa]	Based on limited data taken into account-text refers to vulnerability of informal settlements
9582	1		248		It is great to see extensive coverage of natural impacts in a 1.5 world, but there was lass information on human impacts than anticipated based on the title of this chapter. Discussion of the environmental impacts should be accompanied by detail on what this means for the human populations. This is especially important for the Arctic as a climate change hot spot. [Joanna Petrasek MacDonald, Canada]	This topic will be covered in the AR6. The SR1.5 assesses literature on risks projected at 1.5 and 2C.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
11956	1				General comment on Chapter - Too often, the text on impacts is non-specific ("impacts will be reduced") – we need to know what the impacts are (people affected, economic cost, crops lost) and for that to be quantified (how many more/fewer people affected? How much lost? Which crops and what reduction in yield? etc etc). Moreover a lot of the work doesn't necessarily appear to be specific to 1.5C. If this information isn't available, then the uncertainties and research gaps need to be better outlined. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. The chapter has been shortened and now focuses on 1.5ºC and 2ºC. Where the literature was available, quantifications have been added. Knowledge gaps have been added in 3.7.
9180	1				In order to provide updated information for the proposed IPCC special report, recent research efforts have significantly boosted our knowledge on the risks at 1.5 and 2°C warming, Here some references you may consider in the revised version of the report: Kraaijenbrink, P. D. A., Bierkens, M. F. P., Lutz, A. F. & Immerzeel, W. W. Impact of a global temperature rise of 1.5 degrees Celsius on Asia's glaciers. Nat. Publ. Gr. 549, 257–260 (2017). Grillakis, M. G., Koutroulis, A. G. & Tsanis, I. K. The 2 ° C global warming effect on summer European tourism through different indices. Int. J. Biometeorol. 1205–1215 (2016). doi:10.1007/s00484-015-1115-6. 1. Grillakis, M. G., Koutroulis, A. G., Seiradakis, K. D. & Tsanis, I. K. Implications of 2 ° C global warming in European summer tourism. Clim. Serv. 1, 30–38 (2016). Watson, L. et al. Particulate matter air pollution in Europe in a +2°C warming world, Atmosphric Envirnment 154 (2017). King, A. D., & Karoly, D. J. (2017). Climate extremes in Europe at 1.5 and 2 degrees of global warming. Environmental Research Letters, 12(11), 114031. Mishra, V., Mukherjee, S., Kumar, R., & Stone, D. A. (2017). Heat wave exposure in India in current, 1.5° C, and 2.0° C worlds. Environmental Research Letters, 12(12), 124012. Park, C. E., Jeong, S. J., Joshi, M., Osborn, T. J., Ho, C. H., Piao, S., ... & Kim, B. M. (2018). Keeping global warming within 1.5° C constrains emergence of aridification. Nature Climate Change, 1. Bittermann, K., Rahmstorf, S., Kopp, R. E., & Kemp, A. C. (2017). Global mean sea-level rise in a world agreed upon in Paris. Environmental Research Letters, 12(12), 124010. Dosio, A., & Fischer, E. M. (2017). Will half a degree make a difference? Robust projections of indices of mean and extreme climate in Europe under 1.5 C, 2 C, and 3 C global warming. Geophysical Research Letters. Baiquan, Z., Zhai, P., Chen, Y., & Yu, R. (2018). Projected changes of thermal growing season over Northern Eurasia in a 1.5? and 2? warming world. Environmental Research Letters. Faye, B., Webber, H., Naab, J., MacCarthy, D. S., Adam, M., Ewert, F., ... & Hoogenboom, G. (2018). Impacts of 1.5 versus 2.0° C on cereal yields in the West African Sudan Savanna. Environmental Research Letters. [Marco Turco, Spain]	Thanks for the recommendations. Papers directly related to 1.5ºC-2ºC were included (Grillakis et al, 2016; Bittermann et al, 2017; Zhou, 2018 (incorrectly listed as Baiquan); Faye et al, 2018.
9560	1		248		Very surprised and disappointed to see that the word 'Indigenous' is only mentioned three times throughout this entire chapter on impacts! With an intimate connection to and reliance on the land, Indigenous peoples have experienced incredible impact from climate warming and should be central to this discussion. The lack of mention of Indigenous peoples throughout the sections of this chapter is a significant gap that needs to be addressed. There should be direct mention of impacts on Indigenous peoples and communities in the Executive Summary to highlight the inequality of impacts felt by certain populations (i.e. those populations with a deep connection to the environment and also who have contributed the least to emissions in the first place.) Furthermore, two out of the three mentions of Indigenous peoples is under the brief discussion on Livelihoods and Poverty (p. 134-135). While the connection between worsening livelihoods and poverty due to climate change is an important point to make, the impacts of climate change on Indigenous peoples extends beyond livelihood and poverty. Furthermore, it often isn't useful to lump all Indigenous peoples into one category as is done here. For example, Arctic Indigenous peoples live in a very different context compared to Indigenous peoples in low- and middle-income countries. Lastly, the third and final mention of Indigenous peoples is on p. 187 under box 3.2 where it is noted that under scenario 3, life has become "untenable" for this population, however,this fails to recognize that even under scenario 1 and 2 there are significant implications for Indigenous peoples. Overall, this chapter lacks significant and important information around impacts on Indigenous peoples - missing information and a missed opportunity in light of the newly established Local Communities and Indigenous Peoples platform under the UNFCCC. [Joanna Petrasek MacDonald, Canada]	This topic will be covered in the AR6. The SR1.5 assesses literature on risks projected at 1.5 and 2C.
24258	1		190		the whole text should be justified [Nazan AN, Turkey]	Noted
24260	1		190		The whole text, missing gaps between headlines and paragraphs [Nazan AN, Turkey]	Editorial - copyedit to be completed prior to publication
32848	1		248		The header indicates this is an internal draft instead of second order draft [Kenya]	Noted.
35570	1				General comments to the Chapter Chapter 3 as a whole is a well thought out and rich in content document, professionally combining the previous works of IPCC and recent year's publications on the topic. Undoubtedly, the final work on the text and elimination of existing grammatical and stylistic errors and misprints (for example, subsection 3.4.2.1) will serve to further improve this Chapter of the Special Report. It seems also the authors have even gone beyond the scope of the assigned task and in some ways anticipated the work of IPCC on preparing its sixth report. Perhaps this is due to the involvement of a large number of lead and contributing authors in the Chapter writing. As for individual comments, I would like to single out the only moment. Section 3.4.9.4 'Water' looks extremely incomplete (15 lines only), with a little information addition to Section 3.4 'Fresh water resources'. In particular, the widely discussed role of hydropower under climate change deserves more attention, considering all the pros and cons of this problem. The importance of such a discussion is important, first of all, from two points of view: hydropower as a renewable source of energy vs. the ecological consequences of the dams and reservoirs construction as well as of the HPPs operation on the environment, including CO2 and methane emission from reservoirs. The individual references to this problem, scattered throughout the text, do not give a complete picture of this problem. [Roman Corobov, Republic of Moldova]	Taken into account. Text revised. Section 3.4.9.4 is merged into section 3.4.2.
55296	1		248		Excessive long chapter. An effort to summarize the content should be made. [ELISA BERDALET, Spain]	Accepted. Final draft is shorter than SOD.
7806	1	1	248	50	point # 11 last space issue. Check the whole document. [Anthony Lupo, United States of America]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
7826	1	1	248	50	References throughout have no year in places, please check! This needs to be corrected to make it easier for the reader to find it. [Anthony Lupo, United States of America]	Accepted - Text was revised with the suggested edit
7834	1	1	248	50	Overall the chapter is solid and has a lot of good reference to recent studies. There are minor editorial issues cited above (spaces, mis-spellings, missing years on references). This is the one chapter I have expertise in the material. Good luck. [Anthony Lupo, United States of America]	Thank you
9606	1	1	248	29	My review focus for Chapter 3 was on climate impacts to water resources and related topics like drought, freshwater ecosystems, flooding, and so forth. In these respects, the second-order draft is coming together very nicely and is much improved over the FOD but would benefit from some additional work on precision of language, breadth of literature citations, and scope of discussions. More detailed comments are provided below. [Sean Fleming, United States of America]	Thanks. Review process has helped to improved final draft.
9626	1	1	248	29	Hydrological issues (river runoff, groundwater, water scarcity, drought, flooding, freshwater ecology, etc) come up at multiple locations in this chapter, and the text should be clear on the point that the net impacts of climate change on terrestrial hydrologic systems are to a significant degree modified (either mitigated or exacerbated) by human engineered infrastructure. A great example worth mentioning in this chapter comes from the river systems of western North America. Reservoir capacity of existing dams on the international (US-Mexico) Colorado River is a multiple of total annual runoff, facilitating inter-seasonal and inter-annual storage to compensate in principle for some climate variability and change impacts, yet those climate change effects are expected to be sufficiently significant, including declines in total available flow, that even this tremendous reservoir capacity might not be up to the task of mitgating them. On the other hand, climate change impacts on flows of the international (Canada-US) Columbia River are expected to be relatively modest and consist primarily of seasonal timing shifts, but the reservoir capacity behind existing dams is only a fraction of annual runoff, in principle limiting how effectively that infrastructure can be used to bring climate-modified runoff patterns back in line with natural conditions. That is, engineered infrastructure adds another, important, layer of complexity. In fact, there can be tremendously complex and counter-intuitve feedbacks - see (and cite) the recent work of Jaeger et al. (2017, Finding water scarcity amid abundance using human-natural system models, Proceedings of the National Academy of Sciences, 114, 11884-11889). [Sean Fleming, United States of America]	Rejected. Impacts at 1.5ºC and 2ºC could not be found.
31990	1	1	1	1	I recommended to add this point and the figure from the CESR, Germany. The global warming has a positive correlation with the growing faecal coliform bacteria in rivers and lakes.Reading Fonseca, A., Botelho, C., Boaventura, R. A. R., & Vilar, V. J. P. (2015). Global warming effects on faecal coliform bacterium watershed impairments in Portugal. River Research and Applications, 31(10), 1344-1353. The global map, you can find the UN WWDR 2017 http://unesdoc.unesco.org/images/0024/002471/247153e.pdf page 12: Figure 4 Estimated in-stream concentrations of faecal coliform bacteria (FC) for Africa, Asia and Latin America (February 2008–2010)* [Sisira S. Withanachchi, Germany]	Rejected. Impacts at 1.5ºC and 2ºC could not be found.
31088	1	1	248	1	Comment on whole chapter: it represents an impressive piece of work but it is way too long and detailed. It has a strong natural science bias throughout, reflected in the amount of attention given to modeling, projections, IAMs, and quanitifable estimates of impacts. Very little research on vulnerability and resilience from the social sciences is captured in here, and only in the section on Pacific Island is Indigenous/local knowledge referred to (albeit briefly) despite the considerable published literature on this. Where human dimensions work is captured, broad statements are given that overlook nuances in the litererature, and statement of high confidence are made based on limited references in a number of cases. [James FORD, Canada]	Accepted. The chapter has been shortened and focused on 1.5ºC and 2ºC. A greater attempt has been made to balance the chapter across the natural and social sciences (e.g. moving text to the annexes, cross-chapter referencing, etc.). Significantly more literature covering the social sciences which was not available at the time of writing this draft has also been incorporated into the text.
39194	1	1	134		As you go through the likelihood of increased storms, drought, food security and biodiversity loss, please include human suffering/loss of life likely with these additions, either in 1.5C or 2C. Use of current loss of life due to a hurricane or drought, thus multiplied, would help make clear what is at stake. [Lindsey Cook, Germany]	The assessment is mandated to focus on the risks of 1.5 and 2C, based on the literature. The authors assessed the available literature.
46046	1	1	190	10	The report is an impressive summary of the topic and reading was very inspiring. However, to me it would be crucial to know much more about the reliability of the discussed model results. In discussions with colleagues and by listening to talks I got the impression that drought, precipitation, and e.g. the monsoon are extremely difficult to predict. On the other hand changes in the water availability is a crucial factor influencing the development of human societies. Therefore I would suggest to include much more estimates on the confidence levels of statements as it was done in the report. Since I am sure that the report will be prove read I refrained from giving any editorial comments. [Tim Rixen, Germany]	Thanks. The FAQ have been revised, but they follow a different format than the report and do not use confidence language for readability reasons. In the report, confidence statements have been revised and added.
52450	1	1	190	48	Suggest reading and referencing recent paper by Goodwin et al. (2018) regarding C thresholds to meet 1.5oC scenario. Goodwin et al (2018) advise that cumulative carbon emissions needed to remain below 195-205 PgC (starting in 2017) in order to have a chance to meet the 1.5oC target. See Goodwin et al., Nature Geoscience volume 11, pages102–107 (2018) doi:10.1038/s41561-017-0054-8 [Charlotte Roehm, United States of America]	Rejected. This topic is not relevant to chapter 3 but chapter 2.
52654	1	1	190	48	Given that overshoot is likely to occurr, and in many regions has already occurred, this chapter could target more specifically those areas that have been already outlined as higher risk and already beyond a local mean 1.5oC increase. However, it must be understood that the teleconnections between regions globally can have an impact on other regions that may not yet be at high risk. This may perpetuate the risk factor and potential rate of impact at a faster rate than forecasted. [Charlotte Roehm, United States of America]	A number of regions have been singled out for additional focus. They are highlighted using Boxes and in section 3.5.4.
52658	1	1	190	48	The quality of the figures in this chapter are not very good. Would suggest revisiting the quality during the final editing period. [Charlotte Roehm, United States of America]	Editorial - copyedit to be completed prior to publication
52660	1	1	190	48	The Chapter contains a large number of editorial mistakes throughout. Suggest a thorough editing occurs prior to the next revision/release. [Charlotte Roehm, United States of America]	Accepted - Text was revised with the suggested edit, Editorial - copyedit to be completed prior to publication
52662	1	1	190	48	Believe there is opportunity to decrease the length by summarizing several sections of information into tables. [Charlotte Roehm, United States of America]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
61802	1	1	248	60	Please harmonise the words used to refer to evidence from past climates. At the moment, a diversity of vague terms are used throughout the executive summary and the report (e.g. paleorecords, paleontological evidence.…). Please just refer to "evidence from past climates" which is more rigorous than the diverse jargon terms currently used. For instance, paleoontological should refer to insights from fossils only, and this is obviously not the only line of evidence from the content of the associated box. [Valérie Masson-Delmotte, France]	The terms related to paleodata have been harmonised. All these terms have been replaced by "paleoclimate time series" or "past climate data » as well in chapter 3 than in the executive summary.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
52652	1	1	190	48	One suggestion to help the reader with the rather heavy text content of the chapter is to create small information box inserts that are visuals of the status, accompanied by a mitigation strategy. This quick glance visualization can help to outline some of the more critical points of the chapter. They should not include much writing, and they should focus on providing an impactful visual (i.e. thermometer of current status, a data fact, a visual of a trend and nearing tipping points etc.). While the chapter already provides 'Boxes' for mostly cross-chapter discussion points, these suggested alternative boxes should be small and limited to mostly visual content. [Charlotte Roehm, United States of America]	Thanks for the suggestion. Some of the suggested elements have been adopted in the 'Reasons for Concern' summary diagrams that are now a part of the chapter.
52656	1	1	190	48	Throughout this chapter the role of teleconnections has not been discussed within the context of climate variability and global impacts. Given the growing importance of this issue, and the relevance to synergistic global mitigation approaches, it is increasingly important to address these notions. While it is not the scope of this chapter to add more information beyond the Panel-approved outline, it may benefit the chapter is a small informaiton box were added that briefly outlines what a teleconnection is and how these changes in climatic (circulation) patterns may impact diverse regional systems at large temporal and spatial scales. For example the increased transport of Saharan dust to artci regions an the Rocky Mountains has resulted in decreasing the albedo and thermal properties of snow and ice, thus speeding up the melting process (seasonally and intra-annually). [Charlotte Roehm, United States of America]	The suggestion is appreciated, however the chapter was limited in both scope and length by the approved outline.
61798	1	1	248	60	Congratulations for the quality and amount of work underlying the second order draft of the chapter. My first concern arises from the use of the IPCC calibrated language, which is not consistent across sections, and is not captured in the Executive Summary. My second main concern lies with the length and fluidity of the whole chapter. There are multiple repetitions, from section to section, from sections to summaries of sections (including citing again the same references), and in between boxes and sections. I urge the chapter team to focus on the key findings of the chapter, improve the fluidity of the outline to avoid repetitions, strongly reduce the length (currently 45% over the agreed target length of text), and improve the use of the supplementary online material to archive the details of the assessment. Please use the "regional" boxes to build across the various sections and provide an integrated assessement of impacts and risks for the related specific regions. To avoid repetitions, I would suggest to have a box on ocean ecosystems and fisheries, a box on cities, and a box on Arctic changes (moving text from other sections to these boxes). Does the assessment of implications of 0.5°C further warming identify opportunities? This is not reflected in the Executive Summary. Finally, the implications of sea level rise for vulnerable delta regions should be highlighted, based on the literature, so as to provide a comprehensive assessment with respect to the associated risks. [Valérie Masson-Delmotte, France]	Accepted. The chapter has been shortened and focused on 1.5ºC and 2ºC. Calibrated language is now utilised throughout the chapter and in the ES. Boxes have been used as suggested where the available literature allows.
61804	1	1	248	60	The whole chapter must be screened for style. For instance, while this is the SOD, the upper right corner refers to "internal draft". IPCC calibrated language is episodically italicized. There are a number of typos including spaces in between words. [Valérie Masson-Delmotte, France]	Accepted - Text was revised
61806	1	1	248	60	Do not refer to 1.5°C as a target of the Paris Agreement. The target of the Paris Agreement is to limit global warming well below 2°C. The reference to 1.5°C is aspirational. [Valérie Masson-Delmotte, France]	Accepted. References to 1.5 have been noted as aspirational under the Parsi Agreement.
61812	1	1	248	60	The cross references to other chapters is not adequate, and should be made at a detailed level (sections, not chapters). For instance, page 18, line 5, the call to chapter 2 may be to specific sections. I suggest to coordinate the discussion of weaknesses of models with the current section 2.6 of chapter 2. [Valérie Masson-Delmotte, France]	Accepted. Cross-chapter linkages have been added throughout the entire chapter.
61816	1	1	248	60	I suggest to drop all references to solar radiation management and radiation modification measures from this chapter. It is mentioned several times without content (page 19, one subsection etc). Please just refer in the introduction to the cross chapter box. [Valérie Masson-Delmotte, France]	Accepted. SRM is now only mentioned once in the cross-chapter box on 1.5°C warmer worlds.
61848	1	1	248	60	Please check all references. Several of them are called with no year (e.g. (Mitchell et al.) or (Sieck)). I am not sure that all cited references are listed. [Valérie Masson-Delmotte, France]	Accepted - Text was revised with the suggested edit
61908	1	1	248	60	The chapter needs to think of the best strategy to assess implications of scenarios and 1.5°C-2°C warming for air quality. At the moment information is dispersed, heterogeneous. Links to AR5 (WGI) and chapter 2 (non CO2 mitigation) is important for ensuring coherency. Examples includes health (cities) and crops (ozone). [Valérie Masson-Delmotte, France]	Accepted. The information on air quality has been brought together in two main sections. Cross-chapter linkages have been strengthened.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
63102	1	4	248	60	In chapter 3 page no 8 (3-8), sentences 36-38 describe seasonal abnormality with spatiotemporal context that cause concerns over local culture, history, ecosystem, and community. It is important to find out the root causes of this abnormality and address them in the SOD. At least, the adaptation policy can create space for reducing the gap between locals and externals in the goals of 1.5°C for terrestrial, wetland, coastal, and ocean ecosystems including coral reefs, freshwater systems, and food production systems (i.e., fisheries and aquaculture). The better part of the SOD document is that it recognizes some of the problems. For example, in 3-13, 20-22 describe the mitigating approach that is going to affect food production as it closely linked with globalization and technology. In 3-51, sentences 44-48 describe the uncertainty of results of global warming in the Upper Amazon, Darling, Ganges, Upper Niger and Upper Mississippiis. In 3-70, sentences 19-32 describe water availability reduction caused by past activities and I believe we can learn from this past to review the better direction. Furthermore, in 3-71, 17-34 describe extreme hydrological events (floods and droughts) and these events need to identify what are the root causes behind these events and how we can fix them. This review process encompasses groundwater, water quality, soil erosion, and sediment load. However, it has some limitations in addressing the components like groundwater properly. In 3-52, sentences 34-38 describe the differential outcomes of flood in Europe, NW Russia and North of Sweden. In 3-69, 6-8 describe the differential patterns of changes in systems, sectors, and regions with economic and human driven activities. This difference is visible on the Ganges-Brahmaputra Basin and is connected with local culture, history, and society but the SOD fails to incorporate them properly. These failures raise the question of the effectiveness of the SOD. To reduce the risk of this question, ecocentric adaptation policy can be the major foundation for policy direction. In 3-76, 1-8 describes about terrestrial and wetland ecosystem and this can be protected with local knowledge in place of the models and quantification developed in establishing the adaptation policy direction. Because of this dominant paradigm, nature encounters species extinction and changes in ecosystem function, biomass and carbon stocks. This ecosystem has the differential aspects of forest and woodland ecosystems, dryland ecosystems: Savannas, shrublands, grasslands, deserts, wetlands and freshwater ecosystems, oceans systems storms and coastal run-off. In 3-121, 1-18 describes about human health and this needs to be connected with ecosystem and food sovereignty. In 3-118, 5-13 describe about food security that is described with food production and diversification, distribution, and the access, all of which are part of dominant paradigm of development and fail to recognize the food sovereignty dimension. In 3-128, 37-47 describe economistic aspect of sectors and services and they can be described as “business as usual” as it fails to focus on econcentric aspect of the issue. In 3-134, 44-50 describes livelihoods and poverty, and the changing structure of communities and their effects reflected in migration, displacement, and conflict. Currently, environmental refugees are increasing in the poor countries like Bangladesh because of maldevelopment promoted by the dominant paradigm and this needs to be described in the SOD. [Mohammad Anwar Hossen, Bangladesh]	This is an important issue that is out of scope for the SR1.5. The issue will likely be taken up in the AR6.
9178	1	6			Please change "Lead Authors:Marco Bindi (Italy)" to "Lead Authors: Marco Bindi (Italy)" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
55298	1	6	1	6	Add space: "Authors: Marco". Check this overall, there are many missing spaces between two words. [ELISA BERDALET, Spain]	Accepted - Text was revised with the suggested edit
22734	1	70	150	70	There are many word corecctions such as mistype, misinng space between words, and citations. [Makoot Tamura, Japan]	Accepted - Text was revised
3356	2		7		There are too many title levels in the table of contents: in the AR5 report, 3 levels are usually used (chapter, section, sub-section), while up to 5 levels are used in this chapter. This makes the readability of the table of contents very hard. I suggest to reduce the number of title levels in the table of contents to 3 as in the AR5 report. A fourth level can still be used in the text without appearing in the table of contents. [David Docquier, Belgium]	Accepted. Title levels have been reduced.
3358	2		7		The table of contents is too long (more than 5 pages), mainly due to the too high number of title levels. In the AR5 report, tables of contents are typically one page long. [David Docquier, Belgium]	Accepted. Title levels have been reduced.
29730	2		7		It is difficult to find the guiding thread of Chapter 3, mostly because of the organisation of the different parts. Many parts are repeated. The hierarchy of information may need to be reviewed. Why not bring together all parts dealing with the ocean in one single part. Why not present Chapter 3 as such: 3.3 "Observed & projected impacts & risks", 3.4 "Adaptation options", 3.5 "Avoided impacts & updated risks at 1.5°C vs 2°C". It would also be useful to have an explanation of the different steps followed during the chapter in the introduction. [Capucine Pagniez, France]	Accepted. The chapter has been shortened and focused. Sections dealing with oceans have been bought together under the relevant sub-sections. The Introduction has been rewritten to provide better guidance to the reader and a chapter structure and quick read diagram added.
56574	2	1	7	4	the boxes and subchapters are highlighted and indented identically this makes the very hard to see t a glance where a subchapter begins and ends, I'd strongly suggest to highlight the boxes in a different way and have the whole subchapter appear coherently [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Boxes are highlighted and are located at the end of subsections.
9556	2	8		9	Confusing heading - can this be changed to make it easier to understand what is being discussed? [Joanna Petrasek MacDonald, Canada]	Accepted. Heading of Section 3.2 was revised.
54664	2	8	2	9	Text too long and english doesn't seem to be adequate [Qudsia Zafar, Pakistan]	Accepted. The chapter has been shortened and now more focus on 1.5ºC and 2ºC is given.
53394	2	10	2	10	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication
53512	2	10	2	10	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication
41488	2	12	2	12	vs. [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication - see CID #53394
53396	2	12	2	12	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53514	2	12	2	12	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
41490	2	19	2	19	vs. [Sergio Aquino, Canada]	Editorial - copyedit to be completed prior to publication - see CID #53394
53398	2	19	2	19	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53516	2	19	2	19	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
9558	2	29		34	Glad to see boxes with specific examples/foci on regions (eg. Box 3.2 and 3.3). The Arctic should also have a box here as one of the regions most significantly impacted by warming. While there is attention on the Arctic region under other sections, it would be very useful to include its own box as this region is particularly notable and important when discussing climate impacts. [Joanna Petrasek MacDonald, Canada]	Noted - this was discussed however there is an Arctic box elsewhere in the SR
50960	3	6	3	6	In 3.3.12.1 Please put Atmospheric changes instead of Atmospheric change [Fatima Driouech, Morocco]	Not applicable - This section was rewritten
9724	3	12	5	6	At this stage, the number of subsections in 3.4 makes it almost impossible to follow the overall section rational. [Alexander Nauels, Australia]	Thanks. Section has been revised and some subsections restructured.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9726	3	12	5	6	Generally, the structure of section 3.4 is highly confusing, with inconsistent coverage of observed impacts and projected risks for the individual topics. Why do you have an additional observed impacts and an (incomplete) projected risks subsection for 3.4.4 and none for 3.4.2, 3.4.3, but then explicitely cover observed impacts and projected risks for the later subsections 3.4.7 to 3.4.9? I would suggest to cover both observed impacts and risks for every natural and human systems topic without using extra subsections. Like this, at least one additional level of subsections which would help the reader immensely with uncovering the actual content. [Alexander Nauels, Australia]	Thanks. Section has been revised and some subsections restructured.
35860	3	16	44	17	The "section 3.3.4: Drought and dryness" focuses mostly on Global North, Mediterranean and Sub-Saharan Africa. The regions such as South America, Asia, South East Asia, seems to be overlooked while evaluating the global impact in terms of drought and dryness. Even the reference indicators/studies indicated are very much region specific such as PDSI (suitable for Northern America/USA mostly), specifically designed to treat the drought problem in semiarid and sub humid climates. Also, as suggested by Palmer himself that extrapolation beyond these conditions may lead to unrealistic results. The most frequent problems with PDSI is that the parameters used are empirically determined and mainly tested in the United States, which restricts its use in other regions (see Akinremi et al. 1996) and limits the geographical comparisons based on the PDSI (Heim 2002; Guttman et al. 1992). Again, McKee et al. 1993, suggested that PDSI is designed mainly for agriculture and does not accurately represent the hydrological impacts resulting from longer time period prevailing droughts. Hence, the impact analyses on drought and dryness under 1.5 degree C & 2 degree C scenarios cannot be extrapolated globally with high confidence on the basis of PDSI reference based studies. Though due to its solid theoretical development, robustness and versalities in drought analyses, SPI based studies could form the basis of global impact analyses on drought and dryness, SPEI (mainly based on a monthly climatic water balance i.e., precipitation minus PET) could lead to better picture as it also captures evapotranspiration, temperature stress and drought severity in present scenario of global warming, unlike SPI. In SPI, significant drought influencing parameters are completely ignored assuming that droughts are controlled by the temporal variability of precipitation. Therefore, warming induced drought stress is unable to be captured which has shown much significance in studies analysing tree growth and mortality (e.g., Barber et al. 2000). Hence it becomes quite important to include temperature data in drought index formulation such as SPEI. So, it is recommended to include SPEI related studies also while evaluating the drought and dryness analyses. References: 1. Akinremi, O. O., S. M. Mcginn, and A. G. Barr, 1996: Evaluation of the Palmer drought index on the Canadian prairies. J. Climate, 9, 897–905. 2. Guttman, N. B., J. R.Wallis, and J. R. M. Hosking, 1992: Spatial comparability of the Palmer drought severity index. Water Resour. Bull., 28, 1111–1119. 3. Heim, R. R., 2002: A review of twentieth-century drought indices used in the United States. Bull. Amer. Meteor. Soc., 83, 1149–1165. 4. McKee, T. B. N., J. Doesken, and J. Kleist, 1993: The relationship of drought frequency and duration to time scales. Proc. Eight Conf. on Applied Climatology. Anaheim, CA, Amer. Meteor. Soc. 179–184. 5.Barber, V. A., Juday, G. P. & Finney, B. P. Reduced growth of Alaskan white spruce in the twentieth century from temperature-induced drought stress. Nature 405, 668–673 (2000). [India]	Noted. The regions in which the most robust changes were found were highlighted. We have not discussed results based on PDSI for the reasons mentioned by the reviewer. The suggested articles are too old to be cited (pre-AR5)
9728	3	30	4	14	While I fully acknowledge the challenges of covering ocean systems, coastal systems, and the 'bridge' topic SLR in sections 3.3 and 3.4 in a logical way, the current coverage appears to be way too scattered. Given the mix of natural and human systems in section 3.4, could SLR be taken out of subsection 3.4.4 and covered exclusively in subsection 3.4.5? You could note in subsection 3.4.4 that the impacts and risks of SLR are covered in 3.4.5. Then, covering the global SLR implications, followed by resolving regional impacts/risks for the different categories would dramatically improve clarity. [Alexander Nauels, Australia]	Accepted - work on the FGD focussed on making the links between 3.3 and 3.4 more effective with less overlap and inconsistency
10674	3	32	3	32	Change to 'The differences in the characteristics tropical cyclones under…' [Franklin Paredes, Brazil]	Refers to page 9 line 32: Not applicable - This section was rewritten
46340	3	37	3	37	Fiji [Etienne Piguet, Switzerland]	unclear what this comment refers to
40830	4	6	4	7	consider adopting relevent correction suggested in Chapter 1 (correction 1) [NARESH KUMAR SOORA, India]	It was not possible to identify the comment referred.
24134	4	28	4	28	versus ---> vs. [Mustafa Tufan Turp, Turkey]	Editorial - copyedit to be completed prior to publication - see CID #53394
53400	4	28	4	28	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53518	4	28	4	28	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53402	4	32	4	32	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53520	4	32	4	32	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53404	4	35	4	35	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53522	4	35	4	35	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53406	4	38	4	38	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53524	4	38	4	38	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53408	5	1	5	1	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53526	5	1	5	1	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53410	5	12	5	12	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53528	5	12	5	12	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53412	5	32	5	32	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53530	5	32	5	32	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
41492	6	22	6	22	20C and [Sergio Aquino, Canada]	Accepted - Text was revised
53414	6	24	6	24	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
53532	6	24	6	24	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication - see CID #53394
52996	6	37	6	37	How's about adding a sub-section on snowpacks? [Thian Gan, Canada]	Rejected - there is a subsection on snow in the SOD however this was removed because of a lack of original research in this area since the AR5.
56240	6	39	6	39	Change to "knowledge". [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit
56724	6	39	6	39	Knowledge instead of "Knowldedge" [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit

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1338	8				I suggest to revise the executive summary based on the most important findings from the revised chapter [Karen Olsen, Denmark]	The ES has been substantially revised and refocused on 1.5 C and 2 C.
3360	8		9		Replace 'cross-chapter Box 3.12' by 'cross-chapter Box 3.2' across these 2 pages. [David Docquier, Belgium]	Not applicable - This section was rewritten
3398	8		13		I find this executive summary rather long. I would suggest to concentrate on key findings that are specific to 1.5°C warming. To me, the most important paragraphs are: P8 L5-9, P8 L11-17, P8 L36-41, P8, L43-48, P9 L6-12, P9 L23-28, P9 L39-46, P10 L3-6, P10 L8-13, all paragraphs from P10 L17 to P12 L4 (but it is possible to summarize the large amount of information, for example by merging paragraphs about oceans), P12 L7-13, P12 L27-30, P12 L32-36, P12 L38-42, P13 L5-11, P13 L13-19. [David Docquier, Belgium]	Accepted: We have shortened the executive summary and have focused on these key paragraphs to a large extent.
6154	8				I suggest to revise the executive summary based on the most important findings from the revised chapter [Anne Olhoff, Denmark]	The ES has been substantially revised and refocused on 1.5 C and 2 C.
7194	8		13		Text for the ES is always difficult, but it would be helpful to see more confidence statements with the paragraphs (rather than likelihood statements) and more tangible findings - most of it reads like 'everything will be worse under 2C', no surprises and few details. [Petra Tschakert, Australia]	Accepted: The authors of chapter 3 agree and have included confidence and likelihood statements where possible.
29732	8		13		The Executive Summary is not very clear and perhaps needs to be changed a little bit. The structure of the Executive summary should follow the structure of the chapter. [Capucine Pagniez, France]	Accepted: Ch3 authors have worked hard to create a more logical flow through the executive summary.
53906	8		13		ES is comprehesive and much improved over FOD. Each bullet is phrased slightly differently which makes it very hard to compare across impacts. What about trying for consistent phrasing, e.g. You could phrase iach impact bullet in the order of: 1) AR5 knowledge; 2) This is impact now, 3) impact at 1.5, 4) impact at 2 and above etc. This would be much easier for people to get a handle on - or put a summary table in the ES might be even better [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: CH3 authors have worked hard to create a more logical flow through the executive summary.
13138	8		190		Delete general arguments on global economic impacts arising from a single regional analysis. [Eleni Kaditi, Austria]	The relevant section on aggregate global economic impact has been rewritten in a more succinct manner focussed on 1.5 C and 2.0 C, with more papers referenced. Confidence language has also been added.
4996	8	1	8	26	Having the Executive Summary be composed on 38 pretty loosely connected points really is not very helpful. Typically one wants an Executive Summary to be several major points with a number of supporting points so that they can be easily summarized and conveyed to various levels of officials and interested parties in various levels of detail, and this is just not really possible here. As key major points, I'd suggest something like: (1) Many aspects of our environment, the ecological services that the environment provides, and that societal systems provide for the world's peoples are already significantly stressed by the 1 C increase in the global average temperature and associated impacts that have already become evident, and there is high confidence that further warming will lead to even more disruptive consequences; (2) The consequences for the environment and society of the increase in the global average temperature to 1.5 C will be significantly greater than the consequences now being experienced, especially if this level is sustained and becomes the long-term increase in global average temperature that is considered acceptable; (3) There will be substantial benefits to the environment and society if the peak increase in global average temperature can be kept at 1.5 C rather than allowing it to rise to 2 C and be sustained at that level; (4) Many of the consequences for the environment and society will be primarily determined by the peak increase in global average temperature that occurs, and so overshooting of any target temperature, as will be inevitable if the Paris commitments are not very significantly increased, will be very adverse for the environment and society; and (5) While the peak temperature increase is very important to keep to a minimum, having the target long-term global temperature increase be as low as possible, preferably no more than 0.5 C above preindustrial, is a target that would help to reduce the long-term challenges for achieving the sustainable development goals that have been set for society and future generations. Then, for each of these five points there could be a number of supporting points for each of these points; right now, the chapter summary is just a list of points that is too long and just not put together in a way that can encourage useful policy consideration. [Michael MacCracken, United States of America]	The ES has been substantially revised and refocused to highlight the main results about 1.5 C and 2 C emerging from the Chapter.
6020	8	1	13	26	The Executive Summary offers little or no mention of potentially positive impacts in some regions/sectors of a 1.5 degC increase versus greater increases in temperature or versus recent and lower increases. This is likely to be picked up by governments in regions where modest warming is very likely to produce benefits for some, even if longer-term trajectories might be negative. I would think there could be a dedicated effort to collect positive impacts together so that the issue can be treated visibly, while at the same time offering appropriate balance in relation to adverse impacts. [Timothy Carter, Finland]	The authors of chapter 3 have carefully reviewed the literature and have reported negative, neutral and positive effects in line with the conclusions of these publications. We have indicated ' positive' influences of 1.5 (e.g. some high latitude fisheries) where appropriate but have found few of these at hand.
10518	8	1	13	37	In the Executive Summary, conclusion of each subsection largely emphasized the difference of 1.5 vs 2 warming world, and stressed the impacts of 1.5? warming to be less significant than that of 2? warming. However, this conclusion is too intuitive as higher warming world will of course cause severer impacts. That is the reason we are targeting to a lower warming world. Hence, the Executive Summary and also summary of each subsection should be more focused on the situation of 1.5? warming world. [Hong Yang, Switzerland]	Accepted: Text has been revised and focuses far more on the impacts of 1.5°C and 2°C warming above the preindustrial.
10520	8	1	13	27	In the Executive Summary, there is a lack of information on the implication of different mitigation pathways towards 1.5?. Findings associated with this topic should be highlighted in the Executive Summary. [Hong Yang, Switzerland]	The text in this regard has now been further developed, with greater insights into different mitigation pathways.
17814	8	1	8	26	The authors may want to explain why the science community does think the 1.5C warmer world is physically meaningful. This could be done by adding a box which explains why the 1.5C or 2.0C was determined to be a criteria of warmer world. [Republic of Korea]	Framing questions are covered in chapter 1.
21672	8	1	13	27	The Executive Summary should also be completed with confidence statements and references into relevant sections of the chapter. [Sweden]	Accepted: We have systematically added appropriate confidence and likelihood statements where appropriate.
21674	8	1	13	27	The Executive Summary is unnecessarily long. Presently, it includes duplications, some self-evident statements and presents also findings with low confidence and/or limited evidence. There are furthermore statements of comparison without a reference to what the comparison is to. FInally, it would be useful to harmonize how findings related to 1.5 compared to those related to 2 deg are presented. (presently, e.g. "1.5 less than 2", "1.5 less", "2 more than 1.5", "1.5, 2, more"... this complicates readers' task. [Sweden]	we have shortened the executive summary and have removed duplications, a range of self-evident statements and statements where the confidence is low (low agreement, low evidence et cetera).
21708	8	1	13	27	The Executive Summary should be completed with confidence statements and references into relevant sections of the chapter. [Sweden]	Accepted: We have systematically added appropriate confidence and likelihood statements where appropriate.
21736	8	1			Maybe I am wrong, but I did not find any message in the Executive summary to the expansion of deserts and the appearance of new arid/semi arid areas. I think this is an important issue deserving a few lines/comment in the executive summary. [LUIS VALDES, Spain]	The following sentence appears in the ES 'Above 1.5°C, an expansion of desert and arid vegetation would occur in the Mediterranean biome (medium confidence), causing changes unparalleled in the last 10,000 years (medium confidence)'

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21726	8	1	13	26	The Executive Summary is unnecessarily long. Presently, it includes duplications, some self-evident statements and presents also findings with low confidence and/or limited evidence. There are furthermore statements of comparison without a reference to what the comparison is to. FInally, it would be useful to harmonize how findings related to 1.5 compared to those related to 2 deg are presented. (presently, e.g. "1.5 less than 2", "1.5 less", "2 more than 1.5", "1.5, 2, more"... this complicates readers' task. [Sweden]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review. The executive summary is shorter, and has had duplications, self-evident statements removed. It is also presented a clearer set of mechanisms for comparing between today, 1.5°C and 2°C.
28148	8	1	13	27	Some key information from the respective sections on 'Snow and permafrost' (3.3.6), 'Ocean circulation' (3.3.8) and 'Food security' (3.4.6) is missing in the Executive Summary. Please revise. [Germany]	Noted - SE statements have been revised substantially. Unclear what key information is being referred to here.
30978	8	1	13	13	Instances of IPCC uncertainty language are quite sparse and, in some cases, do not follow the guidance (e.g. 'limited evidence' or even 'no evidence' in one case). Assessing the impact of climate change at 1.5 degC warming represents a challenge due to low signal-to-noise. Assessing the difference between the impacts at 1.5 and 2 degC is even more of a challenge (as stahed in lines 31-32). Assessement of liklihood and confidence is rather critical here, I think. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review.
31434	8	1	13	26	Confidence and/or evidence should be stated. [Japan]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review. We have systematically gone through the chapter and have identified and added much more numerous confidence statements - which is based on the assessment of the level of agreement and robustness of the available evidence to support particular statements with respect to confidence.
35572	8	1	13	26	General comments to Executive Summary · The volume of Executive Summary can be significantly reduced by combining some statements that are close in their content and conclusions · Some conclusions are inherent in any climate change and do not reflect new impacts and risks that will arise when reaching 1.5°C or 2°C warming · The comparison of the impacts of 2°C global warming with those of 1.5°C warming (1.5°C vs. 2°C) is sometimes mainly qualitative and often comes down to an obvious truth, e.g., "warming of 2°C poses greater impacts and risks than warming of 1.5°C". Is there a need in such speculative conclusions? · Sometimes, there is absent uniformity in the used terminology, for example, 2°C and 2.0°C; 1.5°C global warming and 1.5°C of global warming, a 1.5°C warmer world and 1.5°C warmer worlds, etc. In general, the Summary is substantially weaker than the main text both in its informativeness and formulation of principal conclusions. As a result, in its present form, the summary does not reflect fully the depth and scope of the study carried out by the authors of this Chapter. [Roman Corobov, Republic of Moldova]	Mostly accepted: We have worked hard to reduce the length of the executive summary and have removed statements that do not relate to the impacts of 1.5°C and 2°C warming. There is a range of different techniques used for detecting the difference between today, 1.5°C and 2°C. some of these involve drawing on trends associated with past behaviour - which has been deemed robust in several recent papers. all of this effort in the next draft has significantly strengthened executive summary together with its traceability into the main text of chapter 3.
38648	8	1	13	26	The ES is quite long, but it helps very much that you have seprated into sections. This should be kept. It would also be good if you keep the text short below the statements in bold. [Jan Fuglestvedt, Norway]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review. We have significantly shortened the executive summary, and have made support paragraphs shorter in length.
48224	8	1	13	27	Many headline statements are not entailed to certainty qualifiers, without reference to the section findings are derived from. This make difficult tracing back these findings in the report [Sarah Connors, France]	Accepted: we have worked on creating greater traceability between the executive summary and the main text of the chapter.
46066	8	1	188	1	The report is an impressive summary of the topic and reading was very inspiring. However, to me it would be crucial to know much more about the reliability of the discussed model results. In discussions with colleagues and by listening to talks I got the impression that drought, precipitation, and e.g. the monsoon are extremely difficult to predict. On the other hand changes in the water availability is a crucial factor influencing the development of human societies. Therefore I would suggest to include much more estimates on the confidence levels of statements as it was done in the report. Since I am sure that the report will be prove read I refrained from giving any editorial comments. [Tim Rixen, Germany]	Accepted: we have included competence language in most if not all summary statements in the current draft.
50686	8	1	13	26	Water is the only impact aspect in the Executive Summary for which it is mentioned that socioeconomic uncertainty is larger than the uncertainty from climate change impacts. This is well known to be the case for many other impact categories as well, and deserves to be mentioned (Page 124 for instance mentions that socioeconomic conditions are the primary driver of malnutrition vulnerability, not climate) [Bastiaan van Ruijven, Austria]	Accepted. We have worked hard to expand mention of other aspects where impacts are difficult to see relative to the impacts of non-climate change stressors. Note that we have also been cautious in many of the assessment areas in terms of the climate signal versus natural variability, and other human influences.
52600	8	1	13	27	One suggestion that could benefit the executive summary is to present this information in a succinct table. This would enable any reader to process this information more readily without having to read through pages of summary. The table could be formatted to include the area of concern (i.e. precipitation changes, marine systems, disease...), current status (or cumulative status), forecast under 1.5oC (and another column for 2.0oC if deemed necessary), and a final column with prioritized high risk areas and associated suggested mitigation strategies. [Charlotte Roehm, United States of America]	We have created summary tables within the main text but have not included them as part of the executive summary given the need for similarity of structure with other chapters within the special report.
58506	8	1	13	26	Either the statements should explicitly be ordered in terms of how they appear in the underlying chapter (with this being made clear), or some care should be taken to order the main findings in terms of importance - e.g. having human health come after effects on tourism could leave the wrong impression. [Rachel Licker, United States of America]	After careful consideration, the author team for chapter 3 was concluded that the executive summary needed to be more integrative across physical, biological, and human aspects of chapter 3. Constructing chapter 3 in the same sequence misses the opportunity to provide far more integrative statements in the executive summary.
61800	8	1	13	30	The Executive Summary is too long and lacks a consistent use of the IPCC calibrated language (example of sentence to be rewritten : "there is a very real possibility"). Some sentences just state what is obvious (e.g. we are 2/3 of 1.5°C) and should be removed. Many statements just say that 1.5°C is better than 2°C for one element of risk but the reader is provided no content about the corresponding risks (sometimes even for the sign of changes) : there are too many implicit references to the finding of the AR5. Example : "there are clear advantages of restraining ocean warming and acidification to levels consistent with a 1.5°C warmer world compared to 2°C" or "substancial benefits exist for marine fisheries exist if the 1.5°C target... "(where the assessment reports a number of growing risks). A more homogeneous approach related to change in risks from now to 1.5°C and avoided risks from 1.5°C to 2°C is needed. [Valérie Masson-Delmotte, France]	Accepted: we have shortened the executive summary and have worked hard to make it more efficient and logical in its statements. We have also brought forward appropriate confidence assessments for each statement in the executive summary. We have also reduced unnecessary reference and statements associated with the findings of AR5 in the executive summary.

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61954	8	1	13	19	A core principle of IPCC assessments is traceable accounts. One should be able to link the key findings in the Exec. Summaries to the underlying elements of text (curly bracket calls to sections, subsections, tables, figues, boxes etc), and from there to the assessed publications. At this stage this cannot be achieved in the current format of the ES of chapter 3, and due to the lack of key conclusions within the chapter itself, with clear (italicized) and consistent use of the calibrated IPCC language to express confidence in findings. [Valérie Masson-Delmotte, France]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review.
62654	8	1	13	27	Please integrate EBA wherever this can be meanginfully done [Andreas Fischlin, Switzerland]	EBA is mentioned (without the acronym) in the context of CDR/land use/reforestation issues, and also in the context of coastal systems.
62660	8	1	13	27	The ES is way too long. Probably one reason why it contains inconsistencies (e.g. my comment re page 12, lines 7..9). I suggest to merge many ideas into single, very carefully drafted bullets, organized in a very logical and clear structure and throughout consistent style. The current ES is very heterogenous and would profit from following fewer kinds of argumentation. [Andreas Fischlin, Switzerland]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review. we have shortened the executive summary and have worked hard to create a more efficient and logical structure, making traceability from the executive summary to the main text of the chapter more effective.
62674	8	1	13	27	No systematic use of IPCC uncertainty language throughout the ES. Every bullet needs to come with a confidence statement. [Andreas Fischlin, Switzerland]	Accepted: we have worked hard to include confidence language on every summary statement made.
62666	8	1	13	27	While the ES emphasiszes in the beginning that there are multiple pathways to go 1.5°C, no impact bullet makes those differences clear. So why emphasizing those differences among pathways if they do not matter? You need to overhaul your findings considerably to sort this out very clearly, since I agree, the pathways matter (to be specific, I mean the transient temperature evolution, overshoot (how long), without overshoot, coming down to which level after some overshoot etc.. All these can matter significantly when it comes to impacts, notably delayed impacts (forests, soils, other long-living organisms) may relaitively easily survive an overshoot, while more vulnerable systems and organisms may be impactes so strongly, that their recovery may be most difficult for a long time to come. All these differences in time scales and magnitudes of warming and its effects matter a lot in the context of this chapter 3. [Andreas Fischlin, Switzerland]	Accepted: The traceable accounts as well as the confidence language and linkages to the chapters has been a major focus in response to the SOD review. we have now brought these elements into the executive summary.
62672	8	1	13	27	The ES contains many, way too many, vague and inprecise wordings that require very careful reconsideration of what should actually be stated. A major overhaul is necsssary. Frankly, this worries me, because a SOD text should be at a much more mature state and given the SR1.5 will get so much attention. This ES is the main input for the SPM (traceability) and one half of the invitation by the UNFCCC for the SR1.5 is the wish by policy makers to learn about what can be gained from strengthening the 2°C limit to the 1.5°C limit. I doubt the policy makers find the substance they are hoping for in this ES (and therefore in this chapter, traceability), The current SOD ES does unfortunately mostly only give qualitative statements on the fact that something could be gained (close to being trivial, and not much progress over what is already in the Paris Agreement article 2), while mostly failing to be specific in terms of IPCC uncertaintly language (i.e. not the wanted assessment).Please overhaul the entire ES and rephrase as a thorough impact assessment in IPCC uncertainty language. [Andreas Fischlin, Switzerland]	Accepted: we have worked on creating greater traceability between the executive summary and the main text of the chapter. We have also brought forward competence language from the text to support overall summary statements in the executive summary.
11958	8	3	8	32	It is probably worth noting that, given the emphasis placed in earlier chapters on uncertainties surrounding the definition of the preindustrial period, the impacts studies do not always use the same definition as the 1.5°C report. E.g. Sanderson et al., 2017 use 1850-1920 [United Kingdom (of Great Britain and Northern Ireland)]	Not relevant for chapter 3. This is chapter 1 material
22764	8	4	13	26	Many of the paragraphs in Executive Summary do not have reference number of evidence in the chapter or confidence llevel. [Shuzo Nishioka, Japan]	Accepted: traceability has been increased through adding linkages and confidence language where appropriate.
22766	8	4			Executive Summary of Chapter 2 has, in it top, key questions the Chapter would like to respond and answer. This helps reader clear the issues to understand and check the summary correctly responds them. It is recommendable that other chapters also have this key questions part on the top of the Executive Summary. [Shuzo Nishioka, Japan]	Accepted. A short introductory paragraph now provides the context for the chapter and the ES.
22768	8	4			Write here simply some key questions this chaper to tackle. Thiey are, for instance; what impacts are already serious in 1.5 degree world? What are the impacts that can be discriminated by the difference of 1.5 and 2.0?,,,what are the difficulties to judge avoided advantge of 1.5 degree,?.What are the lessons from 1.5 world to realize the 2.0 world? What are the risk of 'overshoot ' scenario? ,,,. [Shuzo Nishioka, Japan]	Accepted. A short introductory paragraph now provides the context for the chapter and the ES.
24088	8	4	13	26	Many of the paragraphs in Executive Summary do not have reference number of evidence in the chapter or confifence llevel. [Shuzo Nishioka, Japan]	Accepted: traceability has been increased through adding linkages and confidence language where appropriate.
24090	8	4			Write here simply some key questions this chaper to tackle. Thiey are, for instance; what impacts are already serious in 1.5 degree world? What are the impacts that can be discriminated by the difference of 1.5 and 2.0?,,,what are the difficulties to judge avoided advantge of 1.5 degree,?.What are the lessons from 1.5 world to realize the 2.0 world?What are the risk of 'overshoot ' scenario? ,,,. [Shuzo Nishioka, Japan]	Accepted. A short introductory paragraph now provides the context for the chapter and the ES.
1214	8	5	8	5	is of great importance to physical should be "is of great importance to the physical" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
4902	8	5	8	9	I would urge making clear in this opening paragraph that considering 1.5 C as the long-term stabilization level has been a politically and not scientifically established value. I think it is very important to make clear that scientists do not endorse this value (or at this point any value), but that what science shows is that for any value above zero there will be impacts for society and that even returning to zero may well leave the world with ongoing sea level rise for a prolongered period. Specifically, how the first sentence is stated is very strange--it reads as if somehow the physical and other systems have the capability of understanding--the group that needs to understand are the decision makers. I would urge revising to say "Understanding how the Earth's physical, chemical, biological and human systems will be affected in a 1.5 C warmer world is important for decisionmakers in the development and implementation of policies relating to food, energy, health, public safety, biodiversity, ecological services and sustainable development." So, I think it needs to be made very clear that this "understanding" is intended for policymakers to be considering in their governing and decision-making. The second sentence can remain as written with the revision. I would then urge rewriting the third sentence to read: "Overall, impacts depend on the system affected, on the peak warming reached, and on the long-term stabilization level, with broad differences and levels of confidence across the systems--both the time history and peak and long-term level of warming are important considerations." [Michael MacCracken, United States of America]	The ES has been substantially revised and refocused to highlight the main results about 1.5 C and 2 C emerging from the Chapter.
6022	8	5	8	6	Understanding of how it unfolds isn't of importance to the systems. It is understanding about how the unfolding world affects those systems that is of importance, so that humanity can work out how to respond [Timothy Carter, Finland]	The ES has been substantially revised and refocused to highlight the main results about 1.5 C and 2 C emerging from the Chapter.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
13376	8	5	13	27	Mention of likely increase of heavy precipitation with increased global warming is made in this chapter (pg 54 line 9-14). However this very important statement was not captured in the Executive Summary [Grenada]	Accepted. Reference to extreme precipitation has been added.
15806	8	5	8	9	Important to clarify that the global target of 1.5oC warming but there will be regional differences where some regions will significantly exceed this value (give an approximate number). [Australia]	Accepted. This is now mentioned in the FGD: "Temperature means and extremes are higher at 2°C as compared to 1.5°C global warming in near all inhabited land regions, and display in some regions 2-3 times greater warming when compared to the GMST (high confidence)."
21680	8	5	8	6	This is a statement, not assessment. Should be removed. [Sweden]	The statement is not in the revised ES.
32166	8	5	13	27	Mention of likely increase of heavy precipitation with increased global warming is made in this chapter (pg 54 line 9-14). However this very important statement was not captured in the Executive Summary [Jamaica]	Accepted. Reference to extreme precipitation has been added.
36454	8	5	13	27	Mention of likely increase of heavy precipitation with increased global warming is made in this chapter (pg 54 line 9-14). However this very important statement was not captured in the Executive Summary [Snaliah Mahal, Saint Lucia]	Accepted. Reference to extreme precipitation has been added.
44310	8	5	8	6	The first sentence is too general and mild. Perhaps rephrase so it is more provocative. [Rita Man Sze Yu, China]	The statement is not in the revised ES.
46008	8	5	8	6	human systems upon which humanity depends is redundant [Tim Rixen, Germany]	Not applicable - This section was rewritten
56576	8	5	8	9	it is unlcear what "impacts and associated responses" means. Do you mean the response to an impact, of the human or the natural system? Rephrase. Replace "physical, chemical and biological" with 'natural" which is the term used in other places in this chapter. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Phrase has been replaced as part of broader text changes.
58494	8	5	8	9	It would be more effective if the authors "showed" readers why understanding the impacts of 1.5C warming is important, instead of telling them that it is (in the first sentence). In addition, the last sentence of the first high-level finding does not make sense - it seems that a word is missing. [Rachel Licker, United States of America]	The text has been changed so that messages are clearer up-front.
60272	8	5	8	6	This is a quick and light example of sensationalism. Some of the statements in the summary and in the text do not end with making scientific statements alone. For instance in this line, "on which humanity depends" sensationalizes the text more. There are many more such examples in the document. [United States of America]	The ES has been substantially revised and refocused to highlight the main results about 1.5 C and 2 C emerging from the Chapter.
62578	8	5	8	9	Whether this is of great importance or not implies a lot of value judgement. Stay away from this, since it tends to be policy prescriptive. Suggest to delete entire bullet. [Andreas Fischlin, Switzerland]	The section is not in the revised ES.
41494	8	6	8	6	delete - upon which humanity depends [Sergio Aquino, Canada]	Not applicable - This section was rewritten
10366	8	7	8	7	it is inclear what the difference between "responses and adaptation options" is [Christopher Reyer, Germany]	The section is not in the revised ES.
15808	8	7			What is the defintion of "surface"? Land/sea/other? [Australia]	Both land and sea. It refers to the global surface temperature.
520	8	8	8	8	Preindustrial Period shouldn't be capitalized [Robert Koppu, United States of America]	Not applicable - This section was rewritten
39564	8	8	8	8	I suggest to replace "preindustrial" by "pre-industrial", in order to keep consistency of language along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
52452	8	8	8	8	This is not consistent formatting across Chapters. Please keep 'pre-industrial period' consistent. [Charlotte Roehm, United States of America]	Accepted, the wording for 'pre-industrial period' is kept consistent.
1216	8	9	8	9	between across should be "between and across" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
3400	8	9			Delete 'between'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6434	8	9	8	9	confidence between across systems' should be 'confidence between systems' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
8970	8	9	8	9	… with broad differences and confidence between across systems I'm not sure what you want to say: differences between systems? Or confidence across systems? Or something other? I'd advise reformulating the sentence [Heike Huebener, Germany]	Accepted - Text was revised to ensure consistency throughout the report
15810	8	9			Fix: "between across" [Australia]	The phrase has been removed.
28150	8	9	8	9	Please revise: between across does not make sense. [Germany]	Not applicable - This section was rewritten
30430	8	9	8	9	Wording: delete either "between" or "across", but don't use both [France]	Not applicable - This section was rewritten
35574	8	9			between systems' instead of 'between among systems' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
49072	8	9	8	9	and confidence between across doesn't make sense [Bill Hare, Germany]	Not applicable - This section was rewritten
52454	8	9	8	9	Suggest removing 'between'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56242	8	9	8	9	Rephrase. [Annika Herbert, Australia]	Not applicable - This section was rewritten
60274	8	9	8	9	between across systems is unclear. Consider rewriting. [United States of America]	Not applicable - This section was rewritten
5564	8	11	8	17	I think it could be relevant to also mention the different degree of predictability of climatic events and mention the positive and negative autocorrelation [Sandra CASSOTTA, Denmark]	Not applicable. Text no longer included.
6024	8	11	8	12	Patterns of warming needn't be especialy different, and could one really tell w.r.t. natural variability in many cases? Furthermore, this statement ignores completely the non-climate changes associated with these pathways that could be much more important for impacts than the warming itself (mentioned on L12) [Timothy Carter, Finland]	Not applicable. Text no longer included.
57018	8	11	8	17	An important point regarding "multiple 1.5C worlds" that is not mentioned here is the role of the climate response: Baker et al (2018) show that the difference between impacts on extreme heat and (less clearly) precipitation at 1.5C under a low versus high climate response (and hence different atmospheric compositions) can be greater than the difference between impacts at 1.5C and 2C under a median response. This has profound policy implications, because it means that if the climate response turns out lower than expected, it would be necessary to reduce GMST below 1.5C to avoid the impacts on these variables currently expected at 1.5C. Hence the impact of uncertainty in the GMST response to emissions on these impacts is lower than implied by assuming simple proportionality. Since so many of the figures and analyses in this chapter rely on scaling impacts to GMST, this point should be stressed in the (very helpful) discussion of "different 1.5C worlds". [Myles ALLEN, United Kingdom (of Great Britain and Northern Ireland)]	Noted. The uncertainty in climate response is addressed in part in the cross-chapter box on 1.5 warmer worlds (different outcomes of global temperature for "1.5°C-consistent emissions scenarios").
57288	8	11	8	12	please include 'Each involves different patterns of warming and related impacts ' in the bold statement as this is the important part of the statement, and add a couple of sentances re impacts (human systems and ecosystems) [Hans Poertner, Germany]	Not applicable. Text no longer included.
58496	8	11	8	17	It seems that the point that "The influence of these different '1.5C climate' pathways is small for some variables… but can be very large for others." is somewhat distinct from the preceding content in this paragraph, and merits being included in the initial bolded sentence. [Rachel Licker, United States of America]	Not applicable. Text no longer included.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
58498	8	11	8	17	It would be useful for the authors to briefly say in one sentence why there are multiple pathways to 1.5C - do pathyways simply refer to the effect that different humans actions will have, or is there any part of this that depends on certainty in climate simulations? [Rachel Licker, United States of America]	Not applicable. Text no longer included.
62580	8	11	8	17	Yes, but this chapter is on impacts not pathways. The headline should therefore not be about pathways, but on impacts. Do multiple pathways make a difference in terms of impacts needs to be addressed here. At most the last sentence makes some sense in this context. [Andreas Fischlin, Switzerland]	Not applicable. Text no longer included.
13862	8	12	8	12	Typo: Cross chapter box 3.12 should be box 3.2 [Michael Wehner, United States of America]	Not applicable - This section was rewritten
21738	8	12		48	It should be cross-chapter Box 3.2 instead of 3.12 (five times in lines 12, 16, 31, 41 and 48) [LUIS VALDES, Spain]	Accepted - References were revised
33506	8	12	8	12	two references to "cross-chapter Box 3.12" - should be "cross-chapter Box 3.2"? [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
60276	8	12	8	12	Typo: Cross chapter box 3.12 should be box 3.2 [United States of America]	Not applicable - This section was rewritten
4526	8	14	8	16	I think that at least the importance for precipitation of future regional climate forcers should be aknowledged and transmitted to the non-scientific community in the executive summary of chapter 3 because this is tightly linked to air quality policies. I think the statement "The influence of these different 1.5°C climate" pathways is small for some climate variables. (e.g., regional temperature and precipitation extremes) ...." is not fully justified in the context of precipitation response to future aerosol emissions. I would add something like "A future world that is 1.5° C warmer can have different precipitation patterns depending on future anthropogenic aerosol emissions driven by different air quality policies. Furtehrmore, the urgent need to provide cleaner air to the population make future low aerosol emission scenarios possible and desirable." See for example two papers on the subject with robust and different precipitation responses to different forcers: 1. Samset, B. H., et al. "Climate impacts from a removal of anthropogenic aerosol emissions." Geophysical Research Letters. 2. Samset, B. H., et al. "Fast and slow precipitation responses to individual climate forcers: A PDRMIP multimodel study." Geophysical Research Letters 43.6 (2016): 2782-2791. [Juan Camilo Acosta Navarro, Spain]	This issue is discussed in section 3.6.2.3. There is not room for this level of detail in the ES
6978	8	14	8	14	It is recommended to use a country instead of contries beacuse it uses the word "overshoot", it seems that the last century, until 2100 AD, is intended. [maryam karimian, Iran]	Comment is not clear. "Countries" is not used in this sentence
9162	8	14	8	14	It is recommended to use a country instead of contries beacuse it uses the word "overshoot", it seems that the last century, until 2100 AD, is intended. [Rahele Modirian, Iran]	Comment is not clear. "Countries" is not used in this sentence
53632	8	15	8	15	Not correct as changes of extremes are not always small [AKM SAIFUL ISLAM, Bangladesh]	Not applicable. Text no longer included.
56578	8	15	8	16	are the 'extremes' in temperature and precipitation really the best example for where there are hardly any differences between the different scenarios? Given the next point is that there are not really any simulations to use for the equilibrium scenario. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. Text no longer included.
4904	8	16	8	16	In addition to indicating "sea level rise" as being highly dependent on the pathway, I would also urge including biodiversity and land cover. I would also somewhere here add a phrase indicating that the difference can also depend on the region (so the Arctic being especially affected) and on the duration of overshoot temperatures, etc. [Michael MacCracken, United States of America]	All of these issues are discussed in the revised ES.
3362	8	19	8	26	The whole paragraph is not clear. Is it really necessary? [David Docquier, Belgium]	Not applicable. Text no longer included.
4908	8	19	8	20	I'm confused. Are there many climate simulations that end up at 1.5 C? Don't most simulations cover heading to higher levels and just go right through 1.5 C? Should this not say "for different pathways than ending up at 1.5 C? [Michael MacCracken, United States of America]	Not applicable. Text no longer included.
10368	8	19	8	19	This statement could be misunderstood as if there were no impact models, but most impact studies use a kind of impact model to translate climate simulations into impacts. I think what you mean here is that the impact model simulations are based on different climate simulations for different pathways. [Christopher Reyer, Germany]	Not applicable. Text no longer included.
24314	8	19	8	26	Maybe highlight forthcoming CMIP6 runs that would allow to address the question more directly for AR6 (as part of ScenarioMIP)? [Joeri ROGELJ, Austria]	Not applicable. Text no longer included.
58500	8	19	8	26	This para is a bit hard to follow and there are some grammatical errors/some of the wording is awkward (e.g. "A more limited number…" and "There is very limited data basis…" - care should be taken to make it more pithy, otherwise the main point gets lost. [Rachel Licker, United States of America]	Not applicable. Text no longer included.
62582	8	19	8	26	Too technical with too much focus on climate simulationsl and therefore with unclear relationship to impcats.Rewrite while focusing on what these caveats mean for impacts. [Andreas Fischlin, Switzerland]	Not applicable. Text no longer included.
4906	8	20	8	20	More than what? More for transient than equilibrium/stabilization? Are there really studies at all for long-term equilbrium with 1.5 C, not only for impacts but for sea level (recalling that the paleoclimate based sea level sensitivity is roughly 15-20 meters per degree and there is enough ice on land for this to be the case up to a couple of degrees C. This sentence just does not seem sufficiently informative. [Michael MacCracken, United States of America]	Not applicable. Text no longer included.
4910	8	21	8	21	What does "other pathways" mean here--other equilibrium levels? Are other pathways than to 1.5 C being considered in this report--I think a bit of clarification is needed. So, to assess pathways that reach equilibrium at some other levels? Actually, are there really many cases at all that go to equilibium. The challenge in this chapter, I would think, is that most modeling studies take the temperature up to a good bit above 1.5 and many do not run long enough to get to equilibrium, if they even have all the processes set up to do that given the whole world would be trending toward equilibrium at different rates in different regions/latitudes, and yet all would be interacting in various ways with what is going on at different latitudes. [Michael MacCracken, United States of America]	Not applicable. Text no longer included.
6436	8	21	8	21	There is very limited data basis' should be 'There is a very limited data basis' [Robert Shapiro, United States of America]	Accepted - Text was revised to ensure consistency throughout the report
31436	8	21	8	21	The meaning of "other pathways" is not clear. [Japan]	Not applicable. Text no longer included.
52456	8	21	8	22	Suggested change: "There is a very limited data available to assess changes for any given climate equilibrium." [Charlotte Roehm, United States of America]	Not applicable. Text no longer included.
56244	8	21	8	21	Change to "There is a very…" [Annika Herbert, Australia]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
56580	8	21	8	23	These sentemces are very unclear. Climate equilibrium is 1.5 equilibrium? And what does observations from observed changes mean? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. Text no longer included.
1218	8	22	8	23	In some cases, inferences regarding impacts of changes in global warming of 0.5°C can also be drawn from observations based on observed changes. Meaning is unclear: there has already been warming of 0.5°C, so should that be observed rather than inferred? Or should it state a further increase of 0.5°C? [Butt Nathalie, Australia]	Not applicable. Text no longer included.
15812	8	22	8	23	Should this read 'additional warming of 0.5oC'? [Australia]	Accepted - Text was revised to ensure consistency throughout the report
21682	8	22	8	23	This appears unclear, and in lighy of the rest of the paragraph, probably does not place well in the Ex.Summary. (Also, the same is said on page 9, lines 8-11). [Sweden]	Not applicable. Text no longer included.
35576	8	22	8	23	under global warming' instead 'in global warming' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
52458	8	22	8	23	In some cases, inferences regarding the impacts of global warming of 0.5oC can also be drawn from observed changes. [Charlotte Roehm, United States of America]	Not applicable. Text no longer included.
18230	8	23	8	26	This sentence righlty points to the challenges of inferring future impacts based on past experience. Yet, including in the SPM, past impacts are used without the appropriate disclaimer to infer future impacts. Please make sure that the disclaimer is explicit whenever this approach is taken in the cpaters or SPM. [Andrea TILCHE, Belgium]	Not applicable. Text no longer included.
31438	8	23	8	23	The meaning of “observations based on observed changes” is not clear. [Japan]	Not applicable. Text no longer included.
49074	8	23	8	23	drawn from observations based on observed changes doesn't really make sense - could be made more clear [Bill Hare, Germany]	Not applicable - This section was rewritten
4912	8	25	8	25	I would think, given that "impacts" are being discussed, that biodiversity and land cover both merit mention (or at least shifts in them, and then also say "sea level rise and coastline shifts". Re-establishment of healthy and stable ecosystems is also going to be a huge issue as it could even depend on the time for evolutionary shifts. Basically, here, the parenthetical example seems too mundane. [Michael MacCracken, United States of America]	The section is not in the revised ES. Impacts are now expanded on in separate bullet points.
52460	8	25	8	25	Add an 's' to 'record'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
44302	8	26	8	26	Period is missing [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
52462	8	26	8	26	Add a full stop at the end of the sentence. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56726	8	26	8	26	Missed a period at the end of this sentence? [Xiaolin Zhang, China]	Not applicable - This section was rewritten
3168	8	28	8	29	Here the length of climatological period is typically 20~30 years, Which is not totally consistent with SPM Box1. The different chose of the length of climatological period will make difference for temperature calculation. [Junying Sun, China]	The section is not in the revised ES. Framing is done in Chapter 1.
15814	8	28	8	32	Suggest delete statement as summary point and work the idea of robustness into the discussion of the significance of the differences between 1.5oC and 2oC scenarios. [Australia]	The statement is not in the revised ES.
52464	8	28	8	28	Would the use of the word 'defined' be better in this instance instead of 'determined'? [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
57292	8	28	8	32	The final sentence should be the bold statement for this bullet [Hans Poertner, Germany]	The ES has been substantially revised and refocused to highlight the main results about 1.5 C and 2 C emerging from the Chapter.
62584	8	28	8	32	Too technical with too much focus on climate simulationsl and therefore with unclear relationship to impcats.Rewrite while focusing on what these caveats mean for impacts. [Andreas Fischlin, Switzerland]	The ES has been substantially revised and refocused to highlight the main results about 1.5 C and 2 C emerging from the Chapter.
34674	8	29			It is suggested to change the period of 20-30 years for only 30 years [Mexico]	Not applicable. Text no longer included.
38650	8	29	8	29	the sentences with "on average" should be reformualted. You mean average over, I guess. [Jan Fuglestvedt, Norway]	Accepted: Sentence is no longer part of the executive summary.
41496	8	29	8	29	delete - typically [Sergio Aquino, Canada]	Not applicable - This section was rewritten
41582	8	29			Change "20–30 years on average" to "20–30 years as minimum" [Czech Republic]	The phrase has been removed.
53634	8	29	8	29	Chapter 1 defines mean period as 30 years (please see page 4, line 35) [AKM SAIFUL ISLAM, Bangladesh]	Accepted: Text has been revised
41584	8	30			Change "are warmer and cooler" to "are warmer or cooler" [Czech Republic]	Not applicable. Text no longer included.
3364	8	31	8	32	Delete the whole sentence 'Distinguishing… uncertainty' as it adds confusion by introducing 2°C warming. It is not really related to this paragraph. [David Docquier, Belgium]	Not applicable. Text no longer included.
4914	8	31	8	32	While it may be hard to do, it needs to be said that study of past climates has made clear that even seemingly small differences in global average temperature can involve very large differences. For example, the difference between the seeming warmth of the Climatic Optimum and the later part of the Holocene was perhaps 0.5-1 C and the difference included the Sahara region being vegtated or not; and the difference between the Little Ice Age and mid-20th century was perhaps 0.5 C or so, and there were large differences in conditions. Also, sea level has been quite different as temperature has changed. Now, some of the reasons likely include the characteristics of the associated forcings, but I don't think this assessment should be leaving the impression that the impacts of seemingly small differences in global average temperature are going to be small--I just don't see how that sort of statement can be justified based on the changes in climate and forcings over Earth history. The differences my be hard to identify early in a transient situation, but this assessment seems to be also assuming that the world would be sustained at 1.5 C warmer than present--and if that happens, the differences between 1.5 and 2 are likely to be quite significant (and not just for sea level). [Michael MacCracken, United States of America]	Accepted: This has been extensively discussed and the definitions developed by chapter 1 have been adopted.
9994	8	31	8	32	Need further details on the level of uncertainties to guide appropriate policies. Feasibility and impacts of the 1.5oC against 2.0oC should be quantified with limited level of uncertainties. [Saudi Arabia]	Not applicable. Text no longer included.
28152	8	31	8	32	Please specify more clearly whether changes/impacts associated with 1.5C in the medium and long term are clearly discernible from 2°C, or delete "in the short run". Please also clarify whether this statement relates to model projections or the expected "real world" manifestations. In addition, it is of utmost importance that this "degree of uncertainty" is quantified and contextualized. What does this mean for the statements of the SR1.5 on impacts? Please add this information to the Executive Summary. In addition, according to WMO and Ch1 of this report, climate change refers to periods of at least 30 years, not 20-30 years, please revise the text. [Germany]	Accepted: We have deleted ' in the short run' and have significantly modified the text around the core issues raised here.
31440	8	31	8	32	We request clarification of the time length referred to by the term “short run,” as it is not clear. [Japan]	Not applicable. Text no longer included.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
55976	8	31	8	32	Also editorial: some lay readers may take away that this sentence means there is no discernable difference. Suggest instead: "Differences between 1.5 and 2 degrees are less detectable in such briefer time frames, but become more certain on longer timescales or as a new long-term GMST." [Pamela Pearson, United States of America]	Not applicable. Text no longer included.
56582	8	31			in the short run? Do you mean transient? Or in the limited amount of time for this report? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
21684	8	32	8	32	This is rather general. Should use confidence statements instead to present degree of certainty and confidence. [Sweden]	Not applicable. Text no longer included.
49806	8	32	8	32	some associated degree is vague and doesn't say that much - when could you ever say stg without some associated degree of uncertainty? [Erik Kjellström, Sweden]	Not applicable. Text no longer included.
53636	8	32	8	32	Not only 1.5C, uncertainty associated with any projections at any specific warming level. [AKM SAIFUL ISLAM, Bangladesh]	Not applicable. Text no longer included.
13866	8	34	10	13	Should also mention about melting of glaciers in high mountain regions and their impacts on humans, ecosystem, water resources etc., not only Greenland and Antarctic melting and their impacts on sea level. [Raden Dwi SUSANTO, United States of America]	Noted - glaciers are mentioned in the context of SLR and non-Slur impacts covered in impacts section of ES.
5566	8	36	8	41	why not also mention the differences in relative humidity and precipitation? [Sandra CASSOTTA, Denmark]	Not applicable, text no longer included.
9996	8	36	8	41	This is general climate science not specific to the 1.5oC - not relevant for an executive summary [Saudi Arabia]	Accepted: We agree that science that is not related to the issue of 1.5°C, however relevant to climate change in general, should not appear in the executive summary. As is clear from the rewritten text, this has been much improved in terms of the focus on the impacts associated with 1.5°C above the preindustrial period.
28154	8	36	8	38	A statement related to maritime areas seems missing. [Germany]	The final version of the Chapter 3 ES contains detailed statements on coastal and ocean ecosystems (including coral reefs); sea-level rise and related displacements of people, ocean acidification, near-shore fisheries, as well as on physical aspects such as marine heat-waves. Thus, effectively, impacts marine on areas under 1.5 vs 2 degrees C of warming feature strongly in the revised ES.
30980	8	36	8	37	It would be useful to quanitfy the land-ocean warming difference here. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. Text no longer included. But more quantitative information on temperature gradients (e.g. between mid-latitude regions and global mean) are now provided in the FGD.
52466	8	36	8	36	Suggested change: "Terrestrial regions, in particular...." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
57024	8	36	8	37	terrestrial regions will warm more than oceanic regions in relative and absolute terms ? [AMANDINE PASTOR, France]	Not applicable. Text no longer included. Land warms more than the oceans in absolute terms.
57290	8	36	8	36	Systematic differences in what? Please be clear in bold statements [Hans Poertner, Germany]	Phrase has been replaced as part of broader text changes.
62586	8	36	9	4	Where are the impcats? Suggest to delete this all and move it at best to the back. [Andreas Fischlin, Switzerland]	Text has been substantially revised but still include assessment of changes in regional climate extremes. These are critical to understand the associated projected changes in impacts.
18232	8	37	8	40	The sentence "Extreme hot days warm faster than mean temperatures across mid-latitude continental regions (e.g., Central Europe, Central North America, Southern Africa) and the coldest days of the year warm more than mean temperature in snow and/or ice-covered regions (e.g., in Arctic land regions, snow-cover mountainous regions)" is very confuse and difficult to understand. Could you please re-phrase it? [Andrea TILCHE, Belgium]	Accepted - Text was revised to ensure consistency and clarity throughout the report
49808	8	37	8	37	Oceanic areas in the Arctic warm more than most terrestrial areas [Erik Kjellström, Sweden]	Chapter 3 clearly points out that warming in the Arctic land and sea areas is higher than in the average global warming. However, contrasting Arctic land and sea warming has not been considered as sufficiently relevant to emphasise in the ES.
3366	8	38			Replace 'faster' by 'more'. [David Docquier, Belgium]	Not applicable - This section was rewritten
35862	8	38	8	41	These lines are difficult to comprehend. Rephrasing is required for understanding. [India]	Not applicable - This section was rewritten
49810	8	38	8	38	I think "more" is better than "faster" here [Erik Kjellström, Sweden]	Not applicable - This section was rewritten
52468	8	39	8	39	Add an 's' to 'temperature' [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56246	8	40	8	40	Change to "snow-covered". [Annika Herbert, Australia]	Not applicable - This section was rewritten
9998	8	43	8	48	Too general and not clear whether this is specific to the 1.5oC of general climate science [Saudi Arabia]	Not directly applicable. Specific text has been removed. More explicit description is provided in the FGD ES: "Substantial changes in regional climate occur between 1.5°C and 2°C global warming (high confidence), depending on the variable and region in question (high confidence). Particularly large differences are found for temperature extremes (high confidence). Hot extremes display the strongest warming in mid-latitudes in the warm season (with increases of up to 3°C at 1.5°C of warming, i.e. a factor of two) and cold extremes at high-latitudes in the cold season (with increases of up to 4.5°C at 1.5°C of warming, i.e. a factor of three) (high confidence)."
28156	8	43	8	44	Please differentiate between rise in extreme temperatures and rise in mean temperature in single regions in comparison to global mean temperature rise or difference in global mean temperature. So, in chapter 3 (p:25;l:9-10) is written ..These differences are larger than 2–2.5°C in some locations (Figure 3.5) and thus four or five times larger than the differences in global mean temperature….(in ES and SPM:..more than three times….). Also, 4.5 °C warming of coldest nights, i.e. 1st percentile, over Arctic seems like an arbitrary pick of statistics - please reconsider whether this level of detail is relevant at ES level? [Germany]	Not directly applicable. Specific text has been removed. We still provide specific quantitative assessments for extremes in the ES of the FGD. This information is considered important to clarify that a 1.5°C global warming does not imply temperature anomalies of 1.5°C everywhere and all the time.
30982	8	43	8	44	This is a nice way of putting it. This could be a headline statement. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
49812	8	43	8	43	Unclear what is meant by "extreme temperatures" [Erik Kjellström, Sweden]	Not applicable. Text has been removed. When used elsewhere: "extreme temperatures" stand for temperatures belonging to the tails of given temperature distributions (i.e. either extreme hot or extreme cold)
53638	8	43	8	43	Perhaps better to use "many times" as it is varies region to region [AKM SAIFUL ISLAM, Bangladesh]	Not applicable. Specific text has been removed.
57026	8	43	8	48	are there some regions with less impact than 1.5° (here is only shown the highest impact) [AMANDINE PASTOR, France]	Not over land

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60278	8	43	8	43	Note the examples given below are not more than three times larger [United States of America]	Not applicable. Specific text has been removed.
50766	8	44	8	44	Global Mean Surface Temperature (GMST) instead of "global mean surface temperture" [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
52470	8	44	8	46	Incomplete sentence. Suggested change: "Climate model projections show, on average, a 4.5oC warming of the coldest nights over Arctic landmasses as a function of 1.5oC of global warming." [Charlotte Roehm, United States of America]	Not directly applicable, specific text has been removed. However, will consider adding "landmasses" when discussing extremes in the Arctic prior to publication.
60280	8	44	8	46	Sentence beginning "For instance,..." is not clear. Consider rewriting. [United States of America]	Not applicable - This section was rewritten
3368	8	45			Remove 'that' [David Docquier, Belgium]	Not applicable - This section was rewritten
4916	8	45	8	45	Need to delete the word "that" [Michael MacCracken, United States of America]	Not applicable - This section was rewritten
17238	8	45	8	45	Delete "that" [David Schoeman, Australia]	Not applicable - This section was rewritten
28158	8	45	8	45	We suppose the sentence is meant to read: "projections show, on average, a 4.5°C warming of the coldest nights"; "delete "that" [Germany]	Not applicable - This section was rewritten
31442	8	45	8	45	Descriptions not only for Arctic land but also for other regions are necessary. Furthermore, it should be sated that there are uncertainties on the projections caused by difference of climate models. Therefore, we would like to ask why data of other areas are not listed. Also we suggest that IPCC should display regionally balanced data. [Japan]	Noted. Will consider adding 1-2 sentences in the executive summary prior to publication providing some general numbers, e.g. land average warming, mid-latitudes, etc.
35578	8	45			Delite 'that' before 'a 4.5°C warming' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
49076	8	45	8	45	grammatical error [Bill Hare, Germany]	Not applicable - This section was rewritten
49814	8	45	8	45	Is it certain that it should read "coldest nights" here? Couldn't it as well be low temperatures during daytime? (or in the morning when it is most often colder than during night) [Erik Kjellström, Sweden]	Yes, this statement refers to the coldest nights (lowest minimum temperature, or TNn).
56248	8	45	8	45	Remove "that", so it reads: ", on average, a…". [Annika Herbert, Australia]	Not applicable - This section was rewritten
52472	8	46	8	46	Suggest changing 'single' to 'individual'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
55978	8	46	8	46	add, ..."warming (3.3.1, 3.3.2), a figure consistent with recent observations (cite is SWIPA, 2017 above). [Pamela Pearson, United States of America]	We are not sure what the "SWIPA 2017" publication is.
49078	8	48	8	48	meaning of "millennial scale thresholds" is not clear [Bill Hare, Germany]	Not applicable - This section was rewritten
4918	9	1	9	4	Not that land use cannot affect a region's climate, but it seems to me the key point to make here is that climate hange is going to affect land cover in many regions and that this has the potential to affect the regional weather, etc. And then to say that while some models attempt to simulate this, there are significant limitations and, in any case, getting to equilibrium on land cover change is a quite long-term process, such that changes can well continue long after the global average temperature is stabilized. [Michael MacCracken, United States of America]	Rejected. The main projected changes in land cover that affect climate are those resulting from changes in land use and land management, especially under 1.5°C scenarios (e.g. BECCS, afforestation, agricultural expansion,...)
10000	9	1	9	1	Land use is an important driver of regional climate. This highlight is too vague and need be more specific [Saudi Arabia]	Not applicable. Text has been substantially revised.
10370	9	1	9	1	there seems to be no logical connection of the preceding paragraphs to this one. [Christopher Reyer, Germany]	Not applicable - This section was rewritten
15816	9	1	9	3	Please link to reference in the chapter for this statement. [Australia]	This specific paragraph has been removed. Effects of land use are mentioned later in the ES in the FGD and refer now to the sections in which they are assessed.
34002	9	1	9	4	It is stated that biophysical feedbacks are not considered in chapter 2. This might influence the mitigation action for 1,5 degrees. Please discuss with Ch. 2 authors if this can be adressed. [Norway]	Accepted: Text been revised.
35516	9	1	9	4	This seems to be a fairly serious limitation of the modelling, in addition to other concerns and controversies around land use change. Isn't this ground enough to seriously downplay such choices in modelling? [Ashok Sreenivas, India]	Not applicable. Specific text has been removed. Challenges with land use are mentioned now later in the ES in the FGD.
52474	9	1	9	3	Land use change is by default a result of human decisions. "Changes in land use can strongly affect regional climate change through biophysical feedbacks..., potentially affecting regional temperature and precipitation patterns." [Charlotte Roehm, United States of America]	Not applicable. Specific text has been removed.
54356	9	1	9	1	The main statement is too vague ("important") [Robert Vautard, France]	Accepted: Text been revised.
56584	9	1	9	4	How do you know if it's not in the pathways (which is restated in 3.2.1 but there is no link to the srex for example where this evidence can be found. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. Specific text has been removed.
21686	9	3	9	4	What does this imply (However…)? [Sweden]	Not applicable. Specific text has been removed.
40968	9	3	9	4	If effects of changes in land use in terms of biophysical feedbacks were not considered in the development of socioeconomic pathwaysin Chapter 2, what are the possible implications? [Lourdes Tibig, Philippines]	Not applicable. Specific text has been removed. However this issue is still mentioned in the ES of the FGD. Specific implications cannot be well assessed given the lack of simulations.
52476	9	3	9	4	However, these effects are not considered in the development of socio-economic pathways discussed in Chapter 2. [Charlotte Roehm, United States of America]	Accepted - Text was revised to ensure consistency throughout the report
24316	9	4	9	4	This feels like an unbalanced point as the effects of temperature and precipitation in general are not considered in any of the pathways assessed in Chapter 2. Why highlight the specific if even the general is already true? [Joeri ROGELJ, Austria]	Not applicable. Specific text has been removed. Challenges with land use are mentioned now later in the ES in the FGD.
1340	9	6	8	12	partially redundant with page 8 lines 19-25 [Karen Olsen, Denmark]	Not applicable. Text has been substantially revised.
3370	9	6	9	12	I think this paragraph should be one of the first paragraphs of the executive summaries as it is a very important statement. [David Docquier, Belgium]	We have discussed this possibility but have decided that This statement was not appropriate for the executive summary given it is the subject of chapter 2 - and is a prominent part of the executive summary along with other related concepts.
4920	9	6	9	6	The bolded phrase applies only to the change in the global average temperature--the world is not nearly at equilibrium at this point when one considers the lag times associated with ice on land, ocean heat adjustments, land cover, etc. Given that this is a chapter on the impacts of climate change, this bolded statement seems very misleading and out of place. The effects and implications of not being at equilibrium need to be mentioned. [Michael MacCracken, United States of America]	Not applicable. This text is no longer included.
6156	9	6	8	12	partially redundant with page 8 lines 19-25 [Anne Olhoff, Denmark]	Not applicable. Text has been substantially revised.
8972	9	6	9	8	I find the phrasing irritating: "achieving a global mean temperature of 1.5°C requires an additional warming of 0.5°C compared to present". I would propose instead "keeping global mean warming at 1.5°C above preindustrial temperatures requires limiting additional warming to not more than 0.5°C compared to present." [Heike Huebener, Germany]	Not applicable, text no longer included.
10372	9	6	9	7	I think it would be more robust to give the 20-30 year average here to be consistent with the statement on P3-8 L28/29 [Christopher Reyer, Germany]	Not applicable, text no longer included.

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11960	9	6	9	12	These seems like an important point and would perhaps be better in the previous section ("interpreteting a 1.5°C world"). However, note that "We are two thirds of the way to a 1.5oC world" could be a misleading headline (it's roughly true for global warming, but not necessarily for e.g. Cumulative carbon budget. Perhaps just replace 'We" with "Global warming". [United Kingdom (of Great Britain and Northern Ireland)]	Agreed but considered in other chapters.
13850	9	6	9	8	While the statement about being two thirds the way to 1.5C is indeed true, it is somewhat misleading. Carbon emissions today alone would bring us closer to 1.5 if there were not cooling from sulfate aerosols.We are in fact closer to the stabilized target in terms of allowable emissions. Any stabilized scenario would inevitably lead to reduced aerosol concentrations and unleashing of that hidden warming. [Michael Wehner, United States of America]	Not applicable, text no longer included.
17240	9	6	9	7	Here and elsewehere, Chapter 1 asserts that warming is assessed as a 30-year average centred on the year in question. Since we have no data for the 15 years after 2017, can we really make this comparison? [David Schoeman, Australia]	Not applicable, text no longer included.
18234	9	6	8	12	partially overlap with page 8 lines 19-25 [Andrea TILCHE, Belgium]	Accepted: Text been revised.
18236	9	6	9	7	This sentence is unclear. In particular, in order to consider the impacts of 1.5 or 2 degrees, we take the average for a 20 or 30 years period. Yet, in this sentence, we state that we are already half way to the 1.5 based on the average temperature of a single year (2017). [Andrea TILCHE, Belgium]	Not applicable, text no longer included.
28160	9	6	9	7	The reference to a single year is slightly confusing for the reader in the light of the global warming definition (e.g. on p. 8 ln 28-29) referring to average of 20-30 years (should be 30 years according to WMO). It should be made clear what the 1°C estimate for 2017 refers to (observations/observations plus average warming derived from models/observations?). [Germany]	Not applicable, text no longer included.
30984	9	6	9	7	This definition of being two-thirds of the way to 1.5 degC based on a single year seems at odds with the previous statement of warming being defined over 20-30 years. It is dangerious to cherry-pick years in this way in my opinion. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable, text no longer included.
35294	9	6	9	21	These two paragraphs should be in the introduction of the paragraph "The climate characteristics of a 1.5C world". They refer to the present, while the others (including the first two) are about future changes. [Ana Bastos, France]	We have discussed this possibility but have decided that this statement was not appropriate for the executive summary given it is the subject of chapter 2 - and is a prominent part of the executive summary along with other related concepts.
38652	9	6	9	6	Check consistency with ch1 [Jan Fuglestvedt, Norway]	Accepted: we have done so
41296	9	6	9	7	Isnt it that annual average global mean temperatures on a year-to-year basis only transient? [Lourdes Tibig, Philippines]	Not applicable, text no longer included.
44304	9	6	9	12	This seems like one of the key messages. Consider move up the chapter to highlight the urgency? [Rita Man Sze Yu, China]	We have discussed this possibility but have decided that this statement was not appropriate for the executive summary given it is the subject of chapter 2 - and is a prominent part of the executive summary along with other related concepts.
49816	9	6	9	7	It is difficult to understand the concept of "2017" (a single year) and "approximately 1C warmer". Isn't the warming compared to a 30-year average? [Erik Kjellström, Sweden]	Not applicable, text no longer included.
52478	9	6	9	20	Would suggest moving these two paragraphs up in the order presented so that land-use, water availability etc. follow after the large scale precipitation and temperature patterns. [Charlotte Roehm, United States of America]	We have discussed this possibility but have decided that this statement was not appropriate for the executive summary given it is the subject of chapter 2 - and is a prominent part of the executive summary along with other related concepts.
53640	9	6	9	6	This may not true as 2017 is a single year while climate change estimated over a 20-years period [AKM SAIFUL ISLAM, Bangladesh]	Not applicable. This text is no longer included.
56586	9	6	9	12	It is unclear what "two thirds of the way" means (&also not grammatically correct). The sencond half of the point is also a word-for-word repeat of a point above. Rephrase the paragraph. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable, text no longer included.
58502	9	6	9	12	The second sentence of this paragraph, starting with "Consequently…" makes it sound as if warming an additional 0.5C is a good thing (in particular, the use of the word "achieving" and the phrase "requires an additional warming…" add to this tone). Also, what do the authors mean when they say, "...can only be parly inferred based on observations..."? This wording is confusing and should be clarified. [Rachel Licker, United States of America]	Not applicable, text no longer included.
60282	9	6	9	8	While the statement about being two-thirds the way to 1.5°C is indeed true, it is somewhat misleading. Carbon emissions today alone would bring us closer to 1.5°C if there were not cooling from sulfate aerosols. We are in fact closer to the stabilized target in terms of allowable emissions. Any stabilized scenario would inevitably lead to reduced aerosol concentrations and unleashing of that hidden warming. [United States of America]	Agreed but considered in other chapters.
62588	9	6	9	12	Suggest to start this section with this paragraph. Perhaps some ideas from previous bullets can be salvaged and merged in very summarized manner into this paragraph. [Andreas Fischlin, Switzerland]	We have discussed this possibility but have decided that this statement was not appropriate for the executive summary given it is the subject of chapter 2 - and is a prominent part of the executive summary along with other related concepts.
500	9	7	9	7	A typo: "pre-industrial Period" should be "pre-industrial period" [Taoyuan Wei, Norway]	Not applicable - This section was rewritten
30432	9	7	9	8	« Consequently, achieving a global mean temperature of 1.5°C requires an additional warming of 0.5°C compared to present. » This sentence needs to be rephrased, one does not want to achieve a GMST of 1.5°C nor "require" an additional warming of 0.5°C. [France]	Not applicable - This section was rewritten
44306	9	7	9	8	Consequently, achieving a… compared to present. This sentence seems redundant. [Rita Man Sze Yu, China]	Not applicable, text no longer included.
55654	9	7	9	7	achieving oops! Better "reaching" [David Cooper, Canada]	Accepted: text revised
57294	9	7	9	8	requires an additional warming this needs rewording, requires suggests a goal [Hans Poertner, Germany]	Not applicable - This section was rewritten
60284	9	7	9	8	Stating that "achieving a global mean temperature of 1.5°C REQUIRES AN ADDITIONAL WARMING of 0.5°C ..." is very odd wording. Edit to read: "...achieving a global mean temperature OBJECTIVE of 1.5°C MEANS THAT FURTHER WARMING OF NO MORE THAN 0.5°C compared to present MAY OCCUR." [United States of America]	Not applicable, text no longer included.
4922	9	8	9	8	requires is the wrong word. It would be better to say "provides room for only an additional warming of 0.5 C compared to the present, at least some of which will be accounted for by the thermal lag of the system; with the world population much higher than during the 20th century and still rising, and with a very large fraction of the global population now in the development phase, limiting warming to only 0.5 C more as compared to prior development leading to a 1 C warming is very likley to prove very difficult to accomplish." [Michael MacCracken, United States of America]	Not applicable, text no longer included.

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10374	9	8	9	8	requires does not seem to be the right word here [Christopher Reyer, Germany]	Not applicable - This section was rewritten
11962	9	8	9	12	These lines are a word-for-word repeat of page 8 lines 23-26 - remove for brevity [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable, text no longer included.
28162	9	8	9	11	Reasoning that impacts from observations cannot be inferred because the observed record represents only one possible realisation seems weird, as this is the realisation we are living in - so the current impacts are the ones related to a 1 °C warming in this realisation. Suggest to specify "future impacts of a 1.5C warmer world can only partly be inferred" [Germany]	Not applicable, text no longer included.
31018	9	8	9	12	Sentence repeated [Rafiq Hamdi, Belgium]	Not applicable, text no longer included.
49080	9	8	9	12	Repetition of P 8 L 22ff. 'one possible realization of the climate system': Unclear. If it refers to natural variability, then please justify. Diffs of 0.5 can be assessed over decadal timescales accounting for nat variability. Aerosol and land use forcing is a different question, but if so should be outlined here clearly [Bill Hare, Germany]	Not applicable, text no longer included.
57028	9	8	9	8	0.5° C more to be achieve when ? [AMANDINE PASTOR, France]	Not applicable, text no longer included.
21740	9	11			It should be cross-chapter Box 3.2 instead of 3.12 [LUIS VALDES, Spain]	Not applicable - This section was rewritten
44308	9	12	9	12	Degrees Celcius is missing. [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
15818	9	13	9	13	Please add heading to make it clear the next points refer to difference between 1.5oC and 2oC warming. Reading further, the text switches between summarising 1.5oC and discussing differences between 1.5oC and 2oC scenarios, which is confusing. [Australia]	Accepted: text revised - have added reference to a further 0.5 to be Celsius warming. Text, however, has been reorganised to make it more efficient and to the point.
3372	9	14	9	21	The first sentence of this paragraph shoud go along with the previous paragraph as it is related to the 0.5°C additional warming. The remaining sentences are related to differences between 1.5 and 2°C worlds, so these should go in a separate paragraph. [David Docquier, Belgium]	Not applicable. Text has been substantially revised.
10002	9	14	9	21	This statements are affirmatives and inexact as most of the claims are based on predictions from models with limitations on the knowledge. No tangible observations have been made yet on the effect of 1.5oC versus the 2.0oC. [Saudi Arabia]	Not applicable. Text has been substantially revised. Note that the text referred to observed differences in impacts for a past warming of 0.5°C in global mean temperature, i.e. which is extrapolatable to some extent (probably as underestimate) for further warming
10376	9	14	9	15	this sentence reads as if there was only a wa rming of 0.5°C until now. [Christopher Reyer, Germany]	Not applicable. Text has been substantially revised.
15820	9	14	9	14	The impact of 0.5oC of global warming on temperature and precipitation extremes is already detectable is this a typo? Was this meat to say 1oC, given the paragraph above says 2017 was already 1oC warmer than the pre industrial? [Australia]	Not applicable, text no longer included.
15822	9	14	9	21	Suggest this is a good place to bring in the issue of detecting the difference between 1.5oC and 2oC warming (pg8 line 28-32). It is an important point that 0.5oC warming that has occured is associated with significant impacts. [Australia]	Not applicable. Text has been substantially revised.
21688	9	14	9	14	This probably refers to impacts for a 0.5deg increment (or the so far occurred 1 deg). Please clarify. [Sweden]	Not applicable. Text has been substantially revised.
28164	9	14	9	14	Why only 0.5°C ? In l 7 a 1.0°C warming is diagnosed - please rephrase to clarify [Germany]	Not applicable. Text has been substantially revised.
49818	9	14	9	16	Here, it is refered to "0.5C warming" while in the preceeding bullet (lines 6-12) it is talked about 1C waming in 2017. What is the timing of 0.5C warming that the impacts are refered to? [Erik Kjellström, Sweden]	Not applicable. Text has been substantially revised.
56588	9	14	9	21	what is the key message in this paragraph? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
57296	9	14	9	15	This is not clear - is this saying that some records already showing 1.5C ie bullet point p8 line 43??? Also, the reservations from preceding parapgaph should not be bold statement Stabilisation of global temperatures at any level – is this really any level or the policy re [Hans Poertner, Germany]	Not applicable. Text has been substantially revised.
58504	9	14	9	15	What exactly do the authors mean with this sentence - what 0.5C warming are they referring to… half of the warming that has already been observed, the next 0.5C warming that would bring us to 1.5C in total, or the difference between 1.5 and 2C, or all of the above? [Rachel Licker, United States of America]	Not applicable. Text has been substantially revised.
62590	9	14	9	15	Very difficult to understand this bold text. What should "the impact of 0.5°C global warming on temeprature and precipitation" be? Temperature impacts on itself (even with positive feedbacks do we not have a direct effect fo temperature on itself, since feedbacks require to go through actual impacts, e.g. albedo change results via sea ice, ice-sheets, snow etc.)? And why 0.5°C? Where is this warming amount coming from? Makes no sense. Then the "the reservations of the preceding paragraph" make no sense whatsoever. What are "reservations of the preceding paragraph"? [Andreas Fischlin, Switzerland]	Not applicable. Text has been substantially revised.
4924	9	16	9	19	This seems in conflict with what is said on page 8, lines 31-32 [Michael MacCracken, United States of America]	Not applicable. Text has been substantially revised.
11964	9	16	9	16	observable - perhaps replace with "detectable", given that these will only be observable once global warming reaches 2K [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
52482	9	16	9	17	Similarly, analyses of transient climate projections on a global scale and for most land regions, reveal observable differences between 1.5°C and 2°C in global warming in terms of the mean temperature and extremes. [Charlotte Roehm, United States of America]	Not applicable. Text has been substantially revised.
15824	9	18	9	18	Suggest re-phrase "Such studies also reveal detectable differences between 1.5°C and 2°C global warming" to "Such studies suggest [or indicate] detectable differences between 1.5°C and 2°C global warming." [Australia]	Not applicable. Text has been substantially revised.
4926	9	19	9	20	This very regional point seems out of place given the global view taken so far in the Executive Summary. [Michael MacCracken, United States of America]	Accepted: text revised.
7010	9	19	9	20	For mean precipitation and various drought measures there is substantially lower risk in the Mediterranean region at 1.5°C compared to 2°C. This outcome should be reassessed again. Because Mediterranean region is very vulnerable to climate change an increase of 1.5°C globally, is more than 1.5°C in the Mediterranean. Also every 1°C increase can cause 9-12% decrease in precipitation in the Mediterranean basin (IPCC AR5,WG1,TS, 2013, page 80, Box TS.6, Figure 1). Stocker, T.F., D. Qin, G.-K. Plattner, L.V. Alexander, S.K. Allen, N.L. Bindoff, F.-M. Bréon, J.A. Church, U. Cubasch, S. Emori, P. Forster, P. Friedlingstein, N. Gillett, J.M. Gregory, D.L. Hartmann, E. Jansen, B. Kirtman, R. Knutti, K. Krishna Kumar, P. Lemke, J. Marotzke, V. Masson-Delmotte, G.A. Meehl, I.I. Mokhov, S. Piao, V. Ramaswamy, D. Randall, M. Rhein, M. Rojas, C. Sabine, D. Shindell, L.D. Talley, D.G. Vaughan and S.-P. Xie, 2013: Technical Summary. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. [Serhat Sensoy, Turkey]	Accepted. FGD text needs to be revised to make clearer that 1.5°C would still lead to increased risks of drying as well.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
7284	9	19	9	22	(Add bold text). Such studies also reveal detectable differences between 1.5°C and 2°C global warming on precipitation extremes in many land regions {3.3.1, 3.3.3, 3.3.13}. For mean precipitation and various drought measures there is substantially lower risk in the Mediterranean region at 1.5°C compared to 2°C {3.3.4} and on evapotranspiration, runoff and snow water equivalent in Europe. [Chantal Donnelly, Australia]	Not applicable. Text has been substantially revised.
11966	9	19	9	19	There is no section 3.3.13 [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
28166	9	19	9	20	What is the agreement on the precipitation changes in the Mediterranean region? Please apply the IPCC calibrated uncertainty language through the exec summary. [Germany]	Text has been substantially revised in the FGD. Corresponding text in the FGD includes IPCC calibrated uncertainty language.
31444	9	19	9	21	We would like to ask why IPCC describes the impacts only in the Mediterranean. For example, in p46 L4 and Figure 3.15 reads that there are some areas where Drought risk is reduced by suppressing to 1.5°C, and others are not so, and there are statements that these predictions are uncertain. Therefore, we suggest that IPCC should display regionally balanced data. [Japan]	FGD includes more extensive discussion across regions. However, we highlight the Mediterranean in the case of water availability, because it is the region with the most robust signal, already for present climate.
49820	9	19	9	20	Strange wording - how can there be a "risk" for "mean precipitation and various drought measures"? [Erik Kjellström, Sweden]	Not applicable - This section was rewritten
52484	9	19	9	19	Suggest using 'over' instead of 'in'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52486	9	19	9	20	A substantially lower risk is predicted for mean precipitation and drought measures in the Mediterranean region at 1.5oC compared with 2oC. [Charlotte Roehm, United States of America]	Not applicable. Text has been substantially revised.
57298	9	19	9	21	The sentence regarding the Mediterranean could form a separate bold statement [Hans Poertner, Germany]	Not applicable, text has been substantially revised. Given other comments (e.g. #31444) does not seem suitable to single out one region in bolded paragraphs.
4928	9	23	9	24	I would urge adding a phrase to the bolded first sentence, with the addition being ", but still significantly larger than would be the case were the global average temperature increase less than 0.5 C" or maybe at the end say "were the global average increase still at is preindustrial level." I think it needs to be repeated over and over that the impacts at 1.5 C will be considerable, even if they are less than 2 C. [Michael MacCracken, United States of America]	Rejected. Only impacts differenced between 1.5 and 2.0 in this ES.
9608	9	23	9	28	Thank you for acknowledging that socioeconomic drivers could have greater influence on flood and drought risk than those associated with the difference between 1.5 and 2.0*C global warming. It also bears clarifying that socioeconomic drivers increase flood and water scarcity sensitivity to climate change - see (and cite) Fleming, 2015, Demand modulation of water scarcity sensitivites to secular climatic variation, Hydrological Sciences Journal, 61, 2849-2859. That potentially massive flood and drought risk increases are a consequence of a de facto coupling between climate and socioeconomic drivers is a key take-home point for scientists, engineers, and policy makers that should probably be strongly emphasized here. [Sean Fleming, United States of America]	Taken into account. Text revised.
10004	9	23	9	23	Should be: Predicted risks of … [Saudi Arabia]	Rejected. "Projected" is correct
11968	9	23	9	24	Projected risks of water availability and extreme hydrological events (flood and drought) at 1.5 C global warming would be reduced compared to the risks at 2?. This sweeping statement possibly applies globally, or regionally for heavy rain, but not in general. It conflicts, for example, with the statement on page 70, line 35: "Climatechange, however, will regionally exacerbate or offset the effects ofpopulation pressure (Jiménez Cisneros et al., 2014b)." [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Text revised.
24136	9	23	9	25	Check the character of ?, it seems that they have different font. [Mustafa Tufan Turp, Turkey]	Not applicable - This section was rewritten
24194	9	23	9	24	1.5°C ve 2°C have different fonts than the others in the whole part of the text [Nazan AN, Turkey]	Not applicable - This section was rewritten
28168	9	23	13	27	Beginning with p9 l23 references are to a great extent missing. That makes it hard to retrace the arguments > please add references [Germany]	References are generally not included in the executive summary.
30986	9	23	9	24	This statement (which doesn't have a reference to the text) is true at the global scale, based on fig 3.13, but is not true at the regional scale where there are many more non-significant differences than significant differences. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. Text revised.
39566	9	23	9	25	Please, check "°C", there seems to be something weird in the letter font. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
49822	9	23	9	23	Consider changing "availibility" into "scarcity" and change order of "drough and flood" later in the same row. [Erik Kjellström, Sweden]	Not applicable - This section was rewritten
62592	9	23	9	28	These are the kind of headlines you need to focus on. (2 vs. 1.5) [Andreas Fischlin, Switzerland]	Agreed.
4930	9	24	9	26	I would urge deleting "however" on line 24, and then adding a phrase to the end of the sentence saying "; for example,in at least some regions, the channeling of flood-prone rivers has the potential to raise the risk more than will likely result from ongoing climate change." [Michael MacCracken, United States of America]	Taken into account. Text revised.
17242	9	24	9	24	The font of the degree symbol seems to be non-standard [David Schoeman, Australia]	Not applicable - This section was rewritten
40138	9	24			What is the likelihood/confidence level? [Ko Barrett, United States of America]	Accepted. Confidence levels are added.
52488	9	24	9	24	Suggest removing 'to the risks at' and replacing with 'with'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
38654	9	25	9	25	You may add "climate" before "difference" to make a clearer separation. [Jan Fuglestvedt, Norway]	Taken into account. Text revised.
56590	9	26			why is this the only place in the summary that gives a measure of confidence? It should be everywhere. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: we have included competence language in most if not all summary statements in the current draft.
52490	9	27	9	27	Suggested change: "...increases projected in..." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
7286	9	28	9	28	Largest increases in Europe - I would argue the agreement (between studies) on changes to flood risk in Europe is low (particularly differences between 1.5 and 2 C) [Chantal Donnelly, Australia]	Taken into account. Text revised.
4932	9	30	9	37	There is a need for some editorial smoothing. For example, in line 30, change "the" to "even". I don't think the sentence on lines 23-24 is justified--once at equilibrium with stable statistics, I'd suggest the difference could be distinguished, even if not in a very short-term record. In any case, use of the word "may" needs to be made unacceptable in this chapter and the report--it provides no useful information and is not part of the defined likelihood lexicon--so, need rewrite or just drop the sentence on lines 32-33. [Michael MacCracken, United States of America]	Accepted. Editorial copyedit to be completed prior to publication
5454	9	30	9	37	The headline statement about the sensitivity of storms to small changes in temperature seems at odds with the AR5 WG1 table SPM1 which states that these is low confidence in trends and future sensitivity/attribution. It also seems at odds with the later statement in this paragraph that the differentces in storms between 1.5 and 2 may be small? Suggest that this statement consider if there has been a change in the attribution of tropical cyclones since the AR and that conficence levels be given for the statements given here (they are missing). [Haroon KHESHGI, United States of America]	At the time of finalising the SOD more literature was available to assess in terms of changes in tropical cyclone attributes under 1.5 vs 2 degrees C of warming. The revised ES now states that tropical cyclones are projected to increase in intensity (with associated increases in heavy precipitation) although not in frequency (low confidence, limited evidence).

Comment No	From Page	From Line	To Page	To Line	Comment	Response
33572	9	30	9	37	I would like suggest to rewrite the whole paragraph to reflect the high uncertainty behind the statement in bold. In page 54, line 17 it is recognized that current climate models have difficulties to project how cyclone attributes may vary under 1.5 vs 2.0. An statement like this could be supported by a number of references larger than the used in page 54, lines from 17 to 36. [Abel Centella, Cuba]	Section 3.3.6 on tropical cyclone attributes under 1.5 vs 2 degrees C of global warming has been significantly revised since the SOD. The revised ES reflects the main assessment of the revised 3.3.6, namely there is limited evidence and low confidence that the global number of tropical cyclones will be less under 2°C of global warming compared to 1.5 °C of warming, but with an increase in the number of very intense cyclones.
40140	9	30			What is the likelihood/confidence level? [Ko Barrett, United States of America]	Executive summary has been revised and confidence/likelihood statements have been added
41298	9	30	9	34	No calibrated language (confidence levels)? As of AR5 and considering available literature, there still is low confidence in these trends. [Lourdes Tibig, Philippines]	Executive summary has been revised and confidence/likelihood statements have been added
44312	9	30	9	30	Large and/or intense storm? [Rita Man Sze Yu, China]	Text has been revised
49824	9	30	9	30	Consider changing "large storms" into "intense storms" [Erik Kjellström, Sweden]	Accepted. Text has been modified.
56592	9	30			what is meant by "small amounts of warming"? 1.5, or2, or both? Confidence measure is missing [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text has been revised
62594	9	30	9	37	Again good, but it is difficult to see some logic behind the sequence (1 vs. 1.5) [Andreas Fischlin, Switzerland]	Accepted. We have significantly revised section 3.3.6 (tropical cyclones) and now refrain in the ES to a single statement based on limited evidence, and made with low confidence, namely that global number of tropical cyclones will be less under 2°C of global warming compared to 1.5 °C of warming, but with an increase in the number of very intense cyclones.
30434	9	31	9	31	« changing attributes of tropical cyclone attributes » Delete repetition [France]	Not applicable - This section was rewritten
31020	9	31	9	31	the changing of tropical cyclone attributes under [Rafiq Hamdi, Belgium]	Not applicable - This section was rewritten
39568	9	31	9	31	To avoid redundancy, I suggest removing the word "attributes" the second time it appears on this line. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
52480	9	31	9	31	Remove 'attributes' after tropical cyclones. Add an 's' at the end of 'cyclone'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52492	9	31	9	31	Remove 'attributes' and add an 's' to 'cyclone' from "…tropical cyclone attributes…" [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
60286	9	31	9	31	Sentence unclear. Consider revising to remove redundant attributes. [United States of America]	Accepted, remove the redundant word. "Very few studies to date have directly explored the changing attributes of tropical cyclones … "
1220	9	32	9	32	differences in of the characteristics tropical cyclones change to "differences in the characteristics of tropical cyclones" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
3374	9	32			Reverse 'of' and 'the characteristics'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6438	9	32	9	32	The differences in of the characteristics tropical cyclones under 1.5°C' should be 'The differences in the characteristics of tropical cyclones' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
8974	9	32	9	32	The differences in of the characteristics tropical cyclones -> "The differences in the characteristics of tropical cyclones" [Heike Huebener, Germany]	Not applicable - This section was rewritten
15826	9	32			Fix: "in of" [Australia]	Accepted, modified the sentence "The differences in the characteristic of the tropical cyclones… "
30436	9	32	9	32	Wording problem : "the differences in the characteristics of tropical cyclones" (delete of) [France]	Not applicable - This section was rewritten
31022	9	32	9	32	The differences in the characteristics of tropical cyclones [Rafiq Hamdi, Belgium]	Not applicable - This section was rewritten
35580	9	32			Delite in after 'The differencies…' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
56250	9	32	9	32	Rephrase to: "…in the characteristics of tropical…." [Annika Herbert, Australia]	Not applicable - This section was rewritten
60288	9	32	9	32	Grammatical error in "The differences in of the characteristics ..." [United States of America]	Not applicable - This section was rewritten
31446	9	35	9	35	"Accumulated cyclonic energy" is not easy to understand. It is expected to describe changes in the intense and/or frequencies of storms, as a result of the crease in "accumulated cyclonic energy". [Japan]	Accepted. The revised ES no longer refers to the term "accumulated cyclonic energy", but it is still used in section 3.3.6. Here the main finding is (limited evidence, low confidence) that the overall number of tropical cyclones may decrease from 1.5 to 2 decrease C, with an associated decrease in the global accumulated cyclonic energy, despite very intense tropical cyclones being projected to increase.
52494	9	37	9	37	Remove space between '1.5o C'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
4934	9	39	9	46	I think that somewhere in this paragraph it needs to be pointed out that the palcoclimatic data indicate a sea level sensitivity of 15-20 meters per degree C change in the global average temperature. All that is being said is that sea level rise will continue, with no sense of the potential magnitude, and yet this can be done. Uncertainty in indicating exactly when some amount of rise will occur can be represented by a spread in time; what there is very good paleoclimatic data to support is that the mount of change could well be many meters. So, in addition to presenting the information on the rate of rise, indicate the total. I'd also note that deriving rates from past conditions is really risky given that the present rate of warming is far above past rates of warming. [Michael MacCracken, United States of America]	Rejected - focus of the SR is on 1.5/2.0 not a broad assessment of SLR literature.
15828	9	39	9	46	We do not know what *will* happen, and the text should reflect that, please re-word. [Australia]	Accepted - this statement substantially revised.
17246	9	39	9	46	This whole paragraph needs careful editing. [David Schoeman, Australia]	Not applicable - This section was rewritten
32074	9	39	9	46	This paragraph is incorrect and dangerously misleading at times. 'Sea level will continue to rise in both 1.5 oC and 2.0oC worlds well beyond the end of the current century': is at least questionable, if this is the main finding of SLR at 1.5 vs 2. In any case, the rate of rise between the two temperatures will substantially differ by 2100. 'As a result, the difference between these worlds will manifest as a delay as to when a 1.5oC world reaches a particular height above present-day sea-level.' This statement is factually incorrect unless the authors assume GMSLR to rise indefinitely. [Jamaica]	Rejected - continual SLR beyond 2100 is a feature of virtually all SL projections. This statement substantially revised in FGD to reflect recent literature.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35296	9	39	9	46	Suggestion: add one sentence about overshoot/no-overshoot differences. (e.g. Palter et al., 2017, ESD Discussions https://doi.org/10.5194/esd-2017-105 - still in discussion) [Ana Bastos, France]	Rejected - ESD not usable if still in discussion
36406	9	39	9	46	This paragraph is incorrect and dangerously misleading at times. 'Sea level will continue to rise in both 1.5 oC and 2.0oC worlds well beyond the end of the current century': is at least questionable, if this is the main finding of SLR at 1.5 vs 2. In any case, the rate of rise between the two temperatures will substantially differ by 2100. 'As a result, the difference between these worlds will manifest as a delay as to when a 1.5oC world reaches a particular height above present-day sea-level.' This statement is factually incorrect unless the authors assume GMSLR to rise indefinitely. [Snaliah Mahal, Saint Lucia]	Rejected - continual SLR beyond 2100 is a feature of virtually all SL projections. This statement substantially revised in FGD to reflect recent literature.
38404	9	39	9	46	This paragraph is incorrect and dangerously misleading at times. 'Sea level will continue to rise in both 1.5 oC and 2.0oC worlds well beyond the end of the current century': is at least questionable, if this is the main finding of SLR at 1.5 vs 2. In any case, the rate of rise between the two temperatures will substantially differ by 2100. 'As a result, the difference between these worlds will manifest as a delay as to when a 1.5oC world reaches a particular height above present-day sea-level.' This statement is factually incorrect unless the authors assume GMSLR to rise indefinitely. [Grenada]	Rejected - continual SLR beyond 2100 is a feature of virtually all SL projections. This statement substantially revised in FGD to reflect recent literature.
39190	9	39	10	1	This is not fully correct or is so poorly expressed that you miss highlighting critical finding of 1.5C/2C difference on sea level rise were irreversible melting of the Greenland icesheet put into action . See Potsdam study 2012 - https://www.pik-potsdam.de/news/press-releases/archive/2012/gronlands-eismassen-konnten-komplett-schmelzen-bei-1-6-grad-globaler-erwarmung [Lindsey Cook, Germany]	Accepted - statement substantially revised in FGD.
49082	9	39			This whole paragraph is incorrect to the extent of potentially being dangerously misleading at times. Sentence by sentence feedback: 'Sea level will continue to rise in both 1.5 oC and 2.0oC worlds well beyond the end of the current century': It is at least questionable, if this is the main finding of SLR at 1.5 vs 2. In any case, the rate of rise between the two will be substantially different already in 2100. 'As a result, the difference between these worlds will manifest as a delay as to when a 1.5oC world reaches a particular height above present-day sea-level.': Factually incorrect unless the authors assume GMSLR to rise indefinitely. [Bill Hare, Germany]	Rejected - continual SLR beyond 2100 is a feature of virtually all SL projections. This statement substantially revised in FGD to reflect recent literature.
49084	9	39			The assessment that "Current literature is insufficient to quantity the current difference in sea level between 1.5 oC and 2.0oC worlds" is not correct: I'm not sure I understand what the 'current difference'is as we're to the best of my knowledge neither at 1.5 nor 2° yet. But more importantly, I disagree with the assessment that current literature is insufficient to quantify (I presume this was meant) the difference between 1.5 and 2. The underlying section in fact includes 3 independent estimates indicating a difference GMSLR difference of about ~10cm in 2100 (and there is in fact at least one more, Bittermann et al. 2017, that is just not cited). 4 studies may not be sufficient for a 'high confidence' statement, but also not 'insufficient'. 'Given the in-depth mechanistic understanding sea level rise (thermal expansion, and ice-sheet and glacier melt) sea level rise will be lower in a 1.5oC world (high confidence). ': Lower than 2·C? Time-scale? Multi-millennial? If yes, please give range based on Levermann et al. (2013). 'Paleorecords show that that once melting is triggered such high sea level rise rates (two times larger than the recent rates) will be sustained over many millennia and are likely unstoppable even within a 2°C warming guardrail.': Which melting is triggered? Unstable retreat of GIS and AIS? What about findings suggesting we could get even much higher rates already ove the time scales of centuries? [Bill Hare, Germany]	Accepted - this statement substantially revised in FGD in light of this literature.
49826	9	39	9	46	My comment on substance relates to "recent rates" - what is meant by "recent"?. This paragraph also needs language revision [Erik Kjellström, Sweden]	Rejected - cannot find use of recent rates
55980	9	39	9	46	This formulation especially in the first two sentences seems misleading, especially that 1.5 degrees will manifest only as a delay rather than a different steady state SLR after several millennia, especially based on paleo studies. As noted later in the chapter, the difference between 1.5 and 2 degrees may manifest as the difference between a stable or unstable WAIS and/or Greenland, where 1.6 degrees is the median temperature of Greenland stability per Robinson et al (2012). Suggest substitute the following language: "Sea level will continue to rise in both 1.5oC and 2.0oC worlds well beyond the end of the current century, as the dynamics driving glacier and ice sheet melt, and thus sea level occur on time scales of centuries rather than decades. Current modeling shows that rate of sea-level rise is slower in a 1.5 degree world, and likely stabilizes at lower levels over time, given the in-depth mechanistic understanding of sea level rise (thermal expansion, and ice-sheet and glacier melt), although it is difficult to quantify the difference with great certainty. Paleorecords show that that once melting is triggered, potentially even in an overshoot scenario, high sea-level rise rates (two times larger than the recent rates) will be sustained over many millennia and are likely unstoppable even within a 2°C warming guardrail, with some dynamics potentially triggered even between 1 and 1.5 degrees." This language then flows more smoothly into the next point (beginning at 3-9-48). [Pamela Pearson, United States of America]	Accepted - statement substantially revised in FGD.
62596	9	39	9	46	Again basically good topic, but it is difficult to see some logic behind the sequence. (2 vs. 1.5) This bullet needs improvement. Sea level rise in 1.5°C and 2.0°C matters not only in terms of a delay. There are many more aspects that need to be discussed here: Is there a difference in terms of commitment? Are there difference with respect to the long term persective (millenia) of exposing the Earth to current warming levels (~1°C), 1.5, and 2°C? Does sea level rise also differ in terms of temperature scenario (overshoot, without overshoot, staying at the limit, coming down again, i.e. like RCP2.6 or RCP1.9)? All these questions are not answered here. [Andreas Fischlin, Switzerland]	Noted - next statement is about Antarctic and Greenland. FGD sees these two statements combined.
9360	9	41	9	42	This statement is somewhat inconsistent with the statement insection 3.3.12.3, page 66, lines 47-49: "There is also a growing consensus between process-based modelling and semi-empirical modelling of Global Mean Sea Level (GMSL) rise. Available studies suggest that GMSL rise by 2100 will be ~0.1m greater in a 2ºC world than a 1.5ºC (Kopp et al., 2016; Nicholls et al.; Schleussner et al., 2015)." [Anna Sörenaaon, Argentina]	Accepted - statement substantially revised in FGD.
28170	9	41	9	42	The message on differences in SLR is not consistent with SPM-9 line 28 and Chapter 3 p.66 line 48 (3.3.12.3): "Available studies suggest that GMSL rise by 2100 will be ~0.1m greater in a 2ºC world than a 1.5ºC (Kopp et al., 2016; Nicholls et al.; Schleussner et al., 2015)." Please check and homogenise. [Germany]	Accepted - statement substantially revised in FGD.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32170	9	41	9	42	several papers were cited Several papers in section indicate otherwise. Inconsistent with SPM and section. Contradictory statement should be removed. [Jamaica]	Accepted - statement substantially revised in FGD.
36458	9	41	9	42	Several papers were cited. Several papers in section indicate otherwise. Inconsistent with SPM and section. Contradictory statement should be removed. [Snaliah Mahal, Saint Lucia]	Text now reads; "While some literature on process-based projections of GMSL at 2100 is available, it is insufficient to distinguish between emission scenarios associated with 1.5ºC and 2ºC worlds. This literature is, however, consistent with Church et al. (2013) assessment of a likely range of 0.28-0.61 m at 2100 (relative to 1986-2005) suggesting that AR5 assessment is still appropriate. Recent emulation-based studies show convergence towards this AR5 assessment (Table 3.1) and offer the advantage of allowing a comparison between 1.5ºC and 2ºC worlds. Table 3.1 presents a compilation of both recent emulation-based and SEM studies."
44902	9	41	9	41	quantity-->quantify? [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
49086	9	41	9	42	This is misleading. There is literature published that would allow for such a quantification. (i.e Schleussner et al. 2016, Bittermann et al. 2017. Kopp et al. 2017). It's more the scenario dependence that is insufficiently resolved. [Bill Hare, Germany]	Accepted - statement substantially revised in FGD.
52496	9	41	9	41	quantify' instead of 'quantity' [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
28172	9	42	9	42	What is meant with "current difference"? [Germany]	Not applicable - This section was rewritten
36444	9	42	9	43	These two statements contradict each other. [Snaliah Mahal, Saint Lucia]	Accepted - statement substantially revised in FGD.
38656	9	42	9	42	What is mean by "current difference" ? Unclear and would be good to reformulate. [Jan Fuglestvedt, Norway]	Noted - statement substantially revised in FGD.
52498	9	42	9	42	Remove space between '1.5 oC'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52506	9	42	9	44	Make this a comparative sentence. "...sea level rise will be lower in a 1.5oC world than in a 2oC world." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
1222	9	43	9	43	should be "understanding of sea level rise" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
6440	9	43	9	43	sea level rise will be lower' should be ' will be lower' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7012	9	43	9	43	sea level rise was written two times, remove one of them. [Serhat Sensoy, Turkey]	Not applicable - This section was rewritten
8976	9	43	9	43	sea level rise (thermal expansion, and ice-sheet and glacier melt) sea level rise -> delete the second "sea level rise" [Heike Huebener, Germany]	Not applicable - This section was rewritten
35582	9	43			Two times 'sea level rise' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
52500	9	43	9	43	Add a comma after the parenthesis. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52502	9	43	9	43	...understanding of sea level rise... [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56252	9	43	9	43	Add "of"? Or rephrase completely. Also add a comma after the parentheses. [Annika Herbert, Australia]	Not applicable - This section was rewritten
57708	9	43	9	43	remoce "sea level rise" after the parenthesis [William Kochtitzky, United States of America]	Not applicable - This section was rewritten
60290	9	43	9	43	Consider rewriting to "understanding of sea level rise (thermal expansion, and ice-sheet and glacier melt)," for clarity [United States of America]	Noted - statement substantially revised in FGD.
3376	9	44			Remove 'that' (twice). [David Docquier, Belgium]	Not applicable - This section was rewritten
6442	9	44	9	44	show that that' should be 'show that' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
12794	9	44			In the sentence: "Paleorecords show that that…." the word "that" is repeated twice by error. [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
21690	9	44	9	44	Melting of what? Ice sheets? [Sweden]	Accepted - statement substantially revised in FGD.
31024	9	44	9	44	Paleorecords show that once [Rafiq Hamdi, Belgium]	Not applicable - This section was rewritten
35584	9	44			Two times 'that' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
35586	9	44	9	46	The last sentence is difficult for understanding. Some woeding is useful. [Roman Corobov, Republic of Moldova]	Accepted - statement substantially revised in FGD.
52504	9	44	9	44	Remove one of the 'that'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
60292	9	44	9	44	Remove redundant "that" [United States of America]	Not applicable - This section was rewritten
13926	9	45	9	45	Paleorecords show that that once melting is triggered such high sea level rise rates (two times larger than the recent rates) will the word such is not provided information here: please rewrite sentence [Natalie MAHOWALD, United States of America]	Not applicable - This section was rewritten
55656	9	45	9	46	...unstoppable even with 2C warming guardrail but what about a 1.5C guardrail? [David Cooper, Canada]	Accepted - statement substantially revised in FGD.
9730	9	46	9	46	Please add section reference. [Alexander Nauels, Australia]	Accepted - statement substantially revised in FGD.
21676	9	46	9	46	Guardrail is not a scientific term nor how temperature goals are viewed in policy, and should be avoided. [Sweden]	Noted - statement substantially revised in FGD.
36446	9	46	9	49	This statement is biased to a 2 degree Celisus change. No mention of 1.5 degrees Celius world scenario [Snaliah Mahal, Saint Lucia]	Accepted - statement substantially revised in FGD.
46642	9	46	9	46	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - statement substantially revised in FGD.
166	9	48	9	48	See my comment on entire chapter. "Millennial scale thresholds" is a poor phrase. Thresholds for what? And thresholds by themselves don't have time scales. What you seem to mean is a threshold beyond which large scale ice loss or rapid ice loss could occur. But even that is insufficient because WAIS probably will respond much faster than most of EAIS and possibly produce a prodigous amount of sea level rise much sooner than a millennium at sufficiently high temperature. Take a little more space and tell the story right. [Michael Oppenheimer, United States of America]	Accepted - statement substantially revised in FGD.
3378	9	48			Replace 'icesheets' by 'ice sheets'. [David Docquier, Belgium]	Not applicable - This section was rewritten
4936	9	48	10	1	What does "significant millennial scale thresholds" mean? I just don't understand. And I don't understand the second sentence--why might this be the case, and reduced probability compared to what? Also, the word "may" needs to be scrubbed out (with rephrasing if needed). Overall, with gradual warming from the last glacial maximum to 8 ka, the pattern of rising did not seem to indicate a strong nonlinear relationship, so what justifies saying "significant reduced probablility"? It is all just not very clear. [Michael MacCracken, United States of America]	Noted - statement substantially revised in FGD.
7860	9	48	10	1	Consequently, a 1.5C world may also have a significantly reduced probability… - it is not clear how this statement follows from the preceding sentence. [Petr Zavialov, Russian Federation]	Not applicable - This section was rewritten
15830	9	48	9	49	Please rewrite as "The world's icesheets are melting at high rates with possible significant millennial scale lags in both Greenland and Antarctica around 1.5oCand 2oC." The chapter needs to reflect recent science showing higher snow accumulation occurring now and possible (up to a point) with warming is likely to offsete some of the melting. [Australia]	Noted - the section on ice sheets makes this point however impact on SLR relative small so not included in ES

Comment No	From Page	From Line	To Page	To Line	Comment	Response
15832	9	48	9	49	Statement is unclear. "millennial scale" presumably refers to the response time (as would make sense) but this interrupts the adjective/noun pair "significant threshold" which pertains to the present situation. It begs the question of what *is* a "significant millennial scale threshold"? Better would be "with significant thresholds for future millennial scale changes in both Greenland and Antarctica..." [Australia]	Accepted - statement substantially revised in FGD.
21692	9	48	10	1	The paragraph is not consistent. The second sentence does not follow "consequently" from the first one. Consider also combining the paragraph with the previous paragraph. [Sweden]	Accepted - statement substantially revised in FGD.
28174	9	48	10	1	Finding should be considered in the SPM, because transgression of this threshold could have major impacts particularly for low-lying coasts. Before transfer into SPM please rephrase the paragraph and clarify what is a "millennial scale threshold" and a "reduced probability of commitment to a multi-metre scale sea level rise"? [Germany]	Agreed and has been raised to SPM
30988	9	48	10	1	This rather alarmig statement could really do with some quantification of rates and thresholds and some assessment of confidence. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - statement substantially revised in FGD.
40142	9	48	9	49	What is the likelihood/confidence level? [Ko Barrett, United States of America]	Noted - statement substantially revised in FGD.
41300	9	48	10	1	Quite ambiguous [Lourdes Tibig, Philippines]	Accepted - statement substantially revised in FGD.
49088	9	48	10	1	Thresholds for what? How can we be certain that thresholds for ice sheet instabilities (assuming that's what they mean) are 'millennial'? There is literature suggesting that it could be faster (i.e. Deconto & Pollard 2016) [Bill Hare, Germany]	Accepted - statement substantially revised in FGD.
49090	9	48	10	1	Thresholds for what? How can we be certain that thresholds for ice sheet instabilities (assuming that's what they mean) are 'millennial'? There is literature suggesting that it could be faster (i.e. Deconto & Pollard 2016). Strengthen 2nd senctence: A 1.5 world will have a lower probability of triggering those. Rest of sentence needs to be redrafted to increase clarity. [Bill Hare, Germany]	Accepted - statement substantially revised in FGD.
62598	9	48	10	1	Addresses some of the issues I found missing in previous bullet, but what means "significantly reduced probability". Please be more precise and use at least IPCC uncertainty language. [Andreas Fischlin, Switzerland]	Noted - statement substantially revised in FGD.
55982	9	48	10	1	From a policy standpoint, this may be the most important impact falling between 1.5 and 2 degrees. It is important to get it scientifically correct, without pulling punches based especially on current observational as well as modelling studies that indicate certain thresholds, for example on Thwaites (Joughin et al, 2015) may already have been passed. Suggest something along the lines of the following to concretize the level of risk: "The world's icesheets are melting at high rates with significant millennial scale thresholds in both Greenland and Antarctica that the paleo record indicates may occur between 1.5 and 2.0C. Consequently, a 1.5oC world may also have a significantly reduced probability of triggering an irreversible, though long-term commitment to multi-metre-scale sea level rise. Current committed sea-level rise was assessed in AR5 as between 1-2 meters, based on thermal expansion and land glacier melt. The paleo-climactic record indicates that both Greenland and the West Antarctic Ice Sheet have threshold points beginning around 1.1 degrees (essentially, current GMST) with probability of committed sea-level rise between 4 and approximately 12 additional meters as 2 degrees is approached and maintained over longer (decadal to century) periods [Pamela Pearson, United States of America]	Noted - statement substantially revised in FGD.
3380	9	49			Add '°' (degree unit) before 'C'. [David Docquier, Belgium]	Not applicable - This section was rewritten
17248	9	49	9	49	Missing degree symbols [David Schoeman, Australia]	Not applicable - This section was rewritten
17816	9	49	9	49	2C ->2°C [Republic of Korea]	Not applicable - This section was rewritten
24138	9	49	9	49	...Greenland and Antarctica around 1.5 and 2.0C. it must be ?. [Mustafa Tufan Turp, Turkey]	Not applicable - This section was rewritten
24196	9	49	9	49	'1.5 and 2.0C" have diffrent fonts than the other parts of the text, there is no °C after 1.5 and 2.0 is adjacent to the "0" [Nazan AN, Turkey]	Not applicable - This section was rewritten
39570	9	49	9	49	Please, replace "1.5 and 2.0C" by "1.5°C and 2.0°C". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
41500	9	49	9	49	missing degrees celcius [Sergio Aquino, Canada]	Not applicable - This section was rewritten
44904	9	49	9	49	2.0C-->2.0oC [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
50768	9	49	9	49	1.5oC and 2.0oC instead of "1.5 and 2.0C" [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
52508	9	49	9	49	Change to "due to observed temperature increases of 1.5oC to 2.0oC.". Remove 'around'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52510	9	49	10	1	This sentence reads a little awkwardly and it is unclear what the authors are trying to convey in the message. Please consider revising this. [Charlotte Roehm, United States of America]	Accepted - statement substantially revised in FGD.
56594	9	49			what is meant by thresholds exist "around 1.5 and 2" they exist in both or we don't know whether they will be reached under 1.5 warming already? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - this statement substantially revised in FGD in light of this literature.
9732	10	1	10	1	Please add section reference. [Alexander Nauels, Australia]	Accepted - statement substantially revised in FGD.
4938	10	3	10	3	Again, scrub "may" as providing no useful indication of likelihood. Here, replacement with "are likely to". On line 5, likely also need to indicate that the comment is about the areas of the dead zones. [Michael MacCracken, United States of America]	Accepted: have rewritten statements concerning ocean chemistry in far more active and IPCC recommended language.
5568	10	3	10	6	I think that a recovery which can take milleniums can be considered irreversible…I will consider the use of this term [Sandra CASSOTTA, Denmark]	Agreed but have rewritten text. Concept of irreversibility now includes changes that may take thousands of years to recover from.
15834	10	3	10	6	Much better evidence of Ocean Acidification are already occuring than the oxygen changes(Barton, A., Hales, B., Waldbusser, G. G., Langdon, C. and Feely, R. A.: The Pacific oyster, Crassostrea gigas, shows negative correlation to naturally elevated carbon dioxide levels: Implications for near-term ocean acidification effects, doi:10.4319/lo.2012.57.3.0698, 2012.). Second it is much easier to attribute the OA impacts to rising CO2 levels. [Australia]	Respectfully, feel that we have profiled the risks associated with both and that comparing the two in terms of the strength of the threat may not be useful or possible in terms of the consensus.
40144	10	3	10	6	Since findings are not specific to 1.5C, suggest this discussion be saved for SROCC or AR6. [Ko Barrett, United States of America]	Accepted: we have done this and have left the full discussion of this for SROCC
41302	10	3	10	6	No confidence levels? [Lourdes Tibig, Philippines]	Accepted: we have now established conference language for each summary statement.
46010	10	3	10	6	Changes in pH, oxygen, and carbonate are creating .. dead zones. Altieri et al. discussed interactions between ocean acidification and oxygen but warming and eutrophication are still believed to be the main driver. [Tim Rixen, Germany]	Accepted: we have reduced discussion of this issue to the text and have removed this particular summary statement from the executive summary.
56596	10	3	10	6	shouldn't there be a mentioning that this has much less to do with temperature than with other drivers in the scenarios? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: we have reduced discussion of this issue to the text and have removed this particular summary statement from the executive summary.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
57300	10	3	10	6	This needs rewording, please explain dead zones and include an sentence on the impacts of ocean acidification [Hans Poertner, Germany]	Accepted: we have reduced discussion of this issue to the text and have removed this particular summary statement from the executive summary. Have also added summary statement that is headed: "Ocean acidification is driving large-scale changes and is amplifying the effects of temperature." with appropriate material describing the impacts of ocean acidification with a focus on the consensus that the impacts of ocean acidification at 2.0°C are greater than 1.5°C.
62600	10	3	10	6	Does not focus on SR1.5 key question re impacts. Thus I suggest to delete this bullet (unless substantially reformulated to address at least the difference between 1.5 and 2 in terms of ocean chemistry). [Andreas Fischlin, Switzerland]	Respectfully, we disagree. Ocean acidification needs to be discussed in the context of its contribution to the impacts at 1.5°C and 2°C. Consequently, we have also added summary statement that is headed: "Ocean acidification is driving large-scale changes and is amplifying the effects of temperature." with appropriate material describing the impacts of ocean acidification with a focus on the consensus that the impacts of ocean acidification at 2.0°C are greater than 1.5°C.
15836	10	4	10	5	Rewrite as: "Changes in pH, oxygen, and carbonate-ion concentration are creating areas of the ocean where conditions killaerobic life (dead zones). Dead zones are increasing as a result of both climate change and non-climate drivers." (we do not know enough to know if they are increasing "exponentially" that adverb is a bit hyperbolic) [Australia]	Accepted: we have done this and have left the full discussion of this for SROCC
17250	10	4	10	4	Oxygen and carbonate are not changing; it is there concentrations that are changing. [David Schoeman, Australia]	Not applicable - This section was rewritten
52512	10	4	10	4	...carbonate concentrations... [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52514	10	4	10	5	Consider: "Changes in pH, oxygen, and carbonate concentrations are generating low oxygen environments that are deadly to fish and other oxygenic life forms (dead zones). [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
57688	10	4			Term oxygenic seems incorrect. Probably Oxygen dependent is meant. [Hans Poertner, Germany]	Accepted - text was revised.
17252	10	5	10	5	Dead zones cannot expand; but their extent of frequency can... [David Schoeman, Australia]	Partially accepted: The increased number of reports of dead zones in different parts of the world is very much one of expanding geographic influence. We also discuss the "increased the frequency of 'dead zones'" within the chapter. Note - we have removed this point in here as It is mostly because of the moment by pollution/organic compounds entering the deep ocean, and in our efforts to shorten the executive summary as requested by the reviewers.
54638	10	5	10	5	Add 'Rapid changes have been already recorded across all range of depths'. [Nadine Le Bris, France]	Discussion of changes to ocean chemistry has been reduced as part of the executive summary shortening - requested by the reviewers.
62708	10	5	10	5	This statement has to be rewritten. In a real, physical system, "exponential" increase is rarely plausible. In this case it is certainly not. More on this in comments on the underlying text. [Greg FLATO, Canada]	Agreed: while the specific mention of an exponential growth in the number of dead zones across the world has been removed as part of the shortening requested by reviewers, we have also modified the text discussions in the chapter to reflect this valid point and now refer to the fact that dead zones have "been growing strongly since the 1990s" in response to the suggestions made by the same reviewer on the main text.
1546	10	8			I suggest the bolded sentence here should be rewritten as "ARCTIC sea ice may persist YEAR-ROUND in a 1.5°C world but not at global temperatyure INCREASES of 2°C or higher". (Resons: The Antractic has sea ice too - but it's behaviour is not as well understood as that in the Arctic, and I don't think there is evidence that the original bolded statement is true for the Antractic as well as the Arctic?). [David Wratt, New Zealand]	Accepted - statement substantially revised in FGD.
4940	10	8	10	13	Need to scrub "may" from the first sentence, using term from the likelihood lexicon. And last sentence needs editorial work. Overall, however, the present warming due to high CO2 levels keeps the wintertime downward IR flux much higher than during the last interglacial, so I'd suggest one has to be very careful with the paleoclimatic infernces that are made. During the Eemian, the lower wintertime CO2 concentration allowed greater wintertime cooling and so ice thickening, so having the ice persis is not so surprising. For the present period, wintertime ice is now very thin and of poor quality, so there is already an indication that significant reduction is underway--I do not see how the phrase "very real possiblity" is justified, especially in referring to year-round ice. I just do not think the last sentence can be justified the way it is now written. [Michael MacCracken, United States of America]	Accepted - statement substantially revised in FGD.
11970	10	8	10	8	Title should state "Arctic" sea-ice [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - statement substantially revised in FGD.
15838	10	8	10	8	Heading must say "Arctic sea ice" as the statement is silent on Antarctica. [Australia]	Accepted - statement substantially revised in FGD.
15840	10	8	10	13	In this chapter any mention of sea ice is exclusively on Arctic sea ice. Accepting that knowledge (incl. that from forward climate simulations) of Antarctic sea ice is not well constrained, this chapter should acknowledge the severity of a +1.50C increase on Antarctic sea ice. [Australia]	Noted - lack of literature means that Antarctic cannot be raised to ES
15842	10	8	10	13	We do not agree with the statement there will be no sea ice in a 2oC scenario. Perhaps regions of the Arctic will be ice free in the winter. Please re-write. What are the significant differences between 1.5 and 2 scenarios? [Australia]	Accepted - revised statement makes it clear that assessment is on Summer sea ice
21694	10	8	10	13	very real possibility and "appreciably probability" are incomprehensible. Please use the calibrated uncertainty language instead. It is probably also not needed to write about "significant advances), lines 8-11, here. Doesn't say much. [Sweden]	Accepted - statement substantially revised in FGD.
31448	10	8	10	14	P8, L31 - L32 reads there is uncertainty in the climate difference between 1.5°C and 2°C and it is stated that it is difficult to distinguish. Therefore, the difference of 1.5°C and 2°C for "sea ice" here should also specify that the confidence is low. [Japan]	Accepted - statement substantially revised in FGD.
40146	10	8	10	13	What is the likelihood/confidence level for this very significant statement? This statement is weakly supported with information specific to 1.5. Perhaps it is best to defer the conversation to other products in the assessment. [Ko Barrett, United States of America]	Accepted - statement substantially revised in FGD.
49092	10	8	10	13	Does this statement also apply for Antarctic sea ice? Otherwise it would be useful to specify "Arctic" [Bill Hare, Germany]	Accepted - statement substantially revised in FGD.
49094	10	8	10	13	very real possibility' , 'appreciably probability'. This is not IPCC language. [Bill Hare, Germany]	Accepted - statement substantially revised in FGD.
49828	10	8	10	8	Should read stg like "Year-round sea ice in the Arctic …" [Erik Kjellström, Sweden]	Accepted - statement substantially revised in FGD.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
52516	10	8	10	11	Divide sentences: "Significant advances have been made in understanding the variability between projections of future Arctic sea ice extent, and the inability of models to capture the sensitivity of sea ice to climate forcing apparent from recent observations. Nonetheless, uncertainty remains substantial." [Charlotte Roehm, United States of America]	Accepted - statement substantially revised in FGD.
54358	10	8	10	8	Arctic (sea ice) should be in the main statement [Robert Vautard, France]	Accepted - statement substantially revised in FGD.
57302	10	8	10	8	Please be clear on bold statement, is this year-round sea ice in the Arctic??? [Hans Poertner, Germany]	Accepted - statement substantially revised in FGD.
57690	10	8			Presumably whole paragraph is refering to Arctic and summer, but not to Antarctic, needs to be specified. [Hans Poertner, Germany]	Rejected - Arctic mentioned in each sentence - pretty clear that the statement does not cover Antarctic
60294	10	8	10	13	The bolded component of this Key Finding (line 8) does not seem to match the explanatory text on lines 11-13. First, the bolded language does not differentiate between year-round sea ice and late summer ice cover. Second, the bolded language states that sea ice will not persist at global temperatures of 2°C or higher, but the supporting text on line 13 states that there is "appreciably [which is a typo] probability that late-summer ice cover will disappear in warmer worlds". So the supporting text indicates that there is a large probably that late-summer ice cover will disappear in warmer worlds (which, by the way is not defined), but this does not match the definitive statement in the bolded part of the finding. [United States of America]	Accepted - statement substantially revised in FGD.
62602	10	8	10	13	Again good, but it is difficult to see some logic behind the sequence (1 vs. 1.5) [Andreas Fischlin, Switzerland]	Accepted - statement substantially revised in FGD.
3382	10	9			Remove bold font for 'sea-ice'. [David Docquier, Belgium]	Not applicable - This section was rewritten
13928	10	9	10	9	Sea ice may persist in a 1.5oC world but not at global temperatures of 2oC or higher. probably need probability in the last part of the sentence: sea ice may persis in a 1.5 C world but is unlikely to persist at global ….. [Natalie MAHOWALD, United States of America]	Not applicable - This section was rewritten
30438	10	9	10	9	« sea-ice » Formatting: Why use bold here ? Please harmonize with other paragraphs. [France]	Not applicable - This section was rewritten
3384	10	11			Remove 'very'. [David Docquier, Belgium]	Not applicable - This section was rewritten
15844	10	11	10	13	Rewrite as "There is a possibility that year-round sea ice in the Arctic would persist in a 1.5°C warmer world (such as it likely persisted during the previous interglacial periods. However it is probable that late-summer ice cover would disappear in worlds warmer than that." [Australia]	Accepted - statement substantially revised in FGD.
15846	10	11	10	13	This sentence does not make sense. What is the meaning of "warmer worlds"? [Australia]	Not applicable - This section was rewritten
15848	10	11	10	13	Unclear sentence; what is meant by 'appreciably probability'? And does 'in warmer worlds' refer to both +1.5oC and +2.0C? [Australia]	Not applicable - This section was rewritten
28176	10	11	10	11	The formulation "a very real possibility" needs to be rephrased in agreed terminology of the IPCC. [Germany]	Not applicable - This section was rewritten
37144	10	11	10	13	Sentence construction [John Sweeney, Ireland]	Not applicable - This section was rewritten
60296	10	11	10	13	The use of "a very real possibility" and "appreciably probability" [note typo] do not provide the reader with a good sense of how probable these events may be. For example, "a very real possibility" could mean 5% or 35%, with both values having very different implications. Using the standard likelihood language would be best, or the authors could provide some quantitative values to support this conclusion. [United States of America]	Accepted - statement substantially revised in FGD.
248	10	12	10	12	.....world since it likely..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
1224	10	12	10	12	should be "such as it likely" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
6444	10	12	10	12	such it likely persisted' should be 'since it likely persisted' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
12796	10	12			In the sentence between paranthesis: "(such it likely …)" an "as" should be added between such and it. It should read "(such as it likely…)" [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
17254	10	12	10	12	Replace "such" with "as". [David Schoeman, Australia]	Not applicable - This section was rewritten
32454	10	12	10	12	(such it likely…: change 'such' to 'as' [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
41304	10	12	10	13	ambiguous [Lourdes Tibig, Philippines]	Accepted - statement substantially revised in FGD.
46644	10	12	10	12	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - statement substantially revised in FGD.
52518	10	12	10	13	Suggest removing "...(such it likely persisted during the previous interglacial periods)..." given the uncertainty associated with this statement. If not removed the sentence will need to be modified. [Charlotte Roehm, United States of America]	Accepted - statement substantially revised in FGD.
56254	10	12	10	12	Change to: "(such as likely…" [Annika Herbert, Australia]	Not applicable - This section was rewritten
249	10	13	10	13	.....and appreciable probability..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
1226	10	13	10	13	should be "and appreciable probability" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
6446	10	13	10	13	and appreciably probability that' should be 'and appreciably probable that' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
17256	10	13	10	13	OK, so I get the colloquial use of "warmer worlds", but it would be advisable to stick to "with more warming" or something similar. [David Schoeman, Australia]	Not applicable - This section was rewritten
28178	10	13	10	13	The formulation "appreciable probability" needs to be rephrased in agreed terminology of the IPCC. [Germany]	Not applicable - This section was rewritten
52520	10	13	10	13	...and an appreciable probability that... [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56256	10	13	10	13	Change "appreciably" to "appreciable". Or rephrase completely. [Annika Herbert, Australia]	Not applicable - This section was rewritten
60298	10	13	10	13	appreciably probability is unclear [United States of America]	Not applicable - This section was rewritten
28180	10	14	10	15	Please insert a para on the reduced risks of tipping points at 1.5°C as referred in Ch 3 at p.3-68 line 33-34. [Germany]	While reference to tipping points is not done specifically throughout the executive summary, it is a core concept underpinning many of the summary statements. Is also dealt with as part of the synthesis associated with the reasons for concern.
267	10	15	10	15	More detailed review of entire sub-section is needed than what I have done herein. [Paul Doyle, Canada]	While reference to tipping points is not done specifically throughout the executive summary, it is a core concept underpinning many of the summary statements. Is also dealt with as part of the synthesis associated with the reasons for concern.
3402	10	15			I feel this title is not appropriate as the whole chapter deals with impacts on natural and human systems. [David Docquier, Belgium]	Accepted: have removed heading as part of a restructuring of the entire executive summary (given many calls from reviewers to shorten, make more logical, and effective in terms of traceability).

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9566	10	15	12	4	The points under this subheading (Impacts on natural and human systems of a 1.5 world) include almost no mention of humans. The only real sentence of substance that mentions impacts on humans is pg. 11 lines 25-26 where impacts on food security, income, and livelihoods are mentioned in relation to fisheries and aquaculture. Either remove the 'human' from this subheading or include much more discussion (something under every point as well as points on their own) that brings in the human dimension. [Joanna Petrasek MacDonald, Canada]	Text replaced with a more general statement encompassing both human and natural systems
18238	10	15	13	26	When discussing impacts on natural and human systems of a 1.5°C world the focus is too much on how impacts differ between 1.5°C and 2°C, rather than on depicting how impacts in a 1.5°C world compare to present conditions. Also, if a comparison is made of impacts under other warming levels, why not considering warming levels that are more in line with the current NDCs, i.e. that are tracking toward a warming of 3–4°C above preindustrial temperatures by 2100? Further, some of the statements in bold in this section are rather general about this comparison (e.g., "Impacts on natural and human systems are lower at 1.5°C than at 2.0°C"). What added value does such statement bring to the general knowledge that impacts increase with warming? [Andrea TILCHE, Belgium]	The new section in the ES on reasons for concern indicates the level of risk at all levels warming between pre-industrial and 2C, and it is not appropriate for this report to discuss much the implications of higher levels of warming, which belongs in AR6. In the chapter, Table 3.5 provides detailed information about risks at different levels of warming.
28182	10	15	13	26	Within this part of the executive summary, there are a number of redundancies (esp. concerning ocean related statements), please revise. [Germany]	Accepted: We have restructured, reorganised and have rewritten the executive summary in line with the many helpful comments and suggested changes.
52522	10	15	10	15	Suggested change: "Impacts of a 1.5oC world on natural and human systems" [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
62604	10	15	10	15	Move this header upwards before bullet 22. It makes no sense only here! The traditional division of labor between WGI and WGII in terms of impacts is arbitrary and I am not hung up on it. So please profit here from the opportunity to follow a fresh approach, where sea level rise, snow cover changes, sea ice changes etc. are considered to be impcats, despite having been assessed traditionally by WGI not dealing with impacts. But please handle these with the WGII approach, notably the risk concept from AR5. In this section I suggest to systematically consider discussing always 2 vs. 1.5 (and perhaps 1 vs. 1.5) for each impact discussed in this section one by one. You could have 2 vs. 1.5 and 1 vs. 1.5 in separate bullets or perhaps merging those views into a single bullet. But try to do it always and in the same sequence and if you can't, explain why the science does not allow to make the assessment. [Andreas Fischlin, Switzerland]	Considered as part of a restructure of the executive summary to highlight greater focus on impacts of 1.5°C and 2.0°C warming.
1228	10	17	10	17	should be "likely to be less at…" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
3386	10	17			Replace 'less' by 'lower at'. [David Docquier, Belgium]	Not applicable - This section was rewritten
4942	10	17	10	17	A phrase needs to be added to the conclusion that is bolded, saying: "2.0 C, but nonetheless still significantly more than if global warming were held to less than 0.5 C." Again, it needs to be made very clear that 1.5 C is going to result in very large impacts. [Michael MacCracken, United States of America]	The new analysis of Reasons for Concern communicates the high levels of risk that remain at 1.5C warming in several cases
11972	10	17	10	17	Start title with, "Overall impacts". Current title could mislead, as some impacts could be positive at 2C and less positive at 1.5C. Or, you could put 'temperature impacts' in the title, since this para refers to temperature [United Kingdom (of Great Britain and Northern Ireland)]	The potential for some positive impacts is mentioned under the section on malaria
12798	10	17	10	18	In the sentence "Impacts are likely to be less 1.5°C than at…" an "at" is missing before the 1.5°C. It should read "Impacts are likely to be less at 1.5°C…" [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
13004	10	17	10	23	This paragraph is very general or unclear in some part. Please concentrate on the main findings. In the present redaction we understand than 2° has more impact than 1.5° and 1°5 has more impact than 1°C !!! Have you more to say than the link with the extreme ? It is not the place here for statement with "no evidence". Moderate should be replaced by medium ?? [Eric Martin, France]	Text reworded
15850	10	17	10	33	Mention that at current (~1oC) levels of warming we are observing substantial impacts on natural systems such as coral reefs, hence even current levels of warming cannot be considered 'safe'. An example is oceanic heat-waves leading to mass bleaching and mortality of corals on the Great Barrier Reef (GBRMPA 2017). For many other coral reef regions coral loss from bleaching began on a massive scale in 1998. [Australia]	Accepted: we have substantially rewritten the section in response to this concern and those of others on related issues. This particular issue is now covered in the following bullet point "The global climate has changed relative to the preindustrial period with multiple lines of evidence that these changes have had impacts on organisms and ecosystems, as well as human systems and well-being (high confidence). The increase in global mean surface temperature (GMST), which reached 0.87°C in 2006-2015 relative to 1850-1900, has increased the frequency and magnitude of impacts (high confidence), strengthening evidence of how increasing GMST to 1.5°C or higher could impact natural and human systems (1.5°C versus 2°C) {3.3.1, 3.3, 3.4, 3.5, 3.6, Cross-Chapter Boxes 6, 7 and 8 in this Chapter}."
15852	10	17	10	40	The three bold points are the same: "XX gets worse in a 2oC world compared to a 1.5oC world". Suggest link natural/human systems and species extinction in one point and save a few paragraphs of text. [Australia]	Text has been reworded in the light of new information which became available - we now have some general statements about human and natural systems and specific ones about (for example) species extinction.
17258	10	17	10	25	Here, and elsewhere, standardise tense of headlines; some are future, some are present. [David Schoeman, Australia]	Accepted - Text was revised to ensure consistency throughout the report
35864	10	17	10	18	Add 'at' before 1.5C [India]	Not applicable - This section was rewritten
41306	10	17	10	19	Is "likely" a calibrated language? [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
46646	10	17	10	17	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Text reworded
50770	10	17	10	18	Impacts are likely to be less at 1.5oC.... instead of "Impacts are likely to be less 1.5oC...." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
52524	10	17	10	20	Suggested change: "Impacts are likely to be less under a 1.5oC than under a 2.0oC change. This is inferred from our understanding of past impacts and the fact that, at global scale and in many regions, a 1.5°C climate is significantly different from a 2°C climate in terms of temperature extremes {Sections 3.3.1 and 3.3.2}." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
54394	10	17	10	17	Impacts on … -can you assign a confidence statement here? And is the "likely" statement supposed to be based on IPCC uncertainty language or is it supposed to be understood in a general sense (then good to reword) [Reinhard Mechler, Austria]	Agree, text reworded

Comment No	From Page	From Line	To Page	To Line	Comment	Response
56258	10	17	10	17	Change to "…to be less at…." [Annika Herbert, Australia]	Not applicable - This section was rewritten
57030	10	17	10	18	Impacts are likely to be less 1.5oC than at 2.0oCé missing "at" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
57304	10	17	10	33	These two headlines statements are saying the same message essentially. The second could be rewritten or the second sentence "Will carry significant benefits…." could be the headline [Hans Poertner, Germany]	Text reworded
62606	10	17	10	17	This rather trivial bold text is the assessment the policy makers made in Paris (see Article 2 of the Paris Agreement). They do not need IPCC to write that (albeit I am of the opinion that the policy makers were a bit daring when they formulated article 2). Consequently IPCC should do better than policy makers. In other words: Please reformulate, get precise and stay away from too trivial statements. Are these impacts significantly lower or not? If yes, state so, if you can't tell, say so. In the bold text only 2 vs. 1.5, but in the text also 1 vs 1.5. Improve on the clarity (see my comment above re page 10, line 15) [Andreas Fischlin, Switzerland]	The ES has been reworded to provide much more detail, but the general 'obvious' statement has also been retained and given a confidence level.
62610	10	17	10	18	The temperature argument is faulty, since temperature change alone is no impact. The assessment is faulty as well, since I would argue it is virtually certain that the impacts are less. The question is whether that less is significant or not, detectable. I would argue that this depends a lot on the sectors, systems, and regions. Perhaps you wanna say that for some sectors, some systems (human natural), some regions the less is significant,.THen make an effort to list those and be prepared that unless this is very carefully backed up, this finding will be heavily disputed at the SPM approval session. A way out could be "A majority of systems", "Some systems" etc. if you do not manage to identify an explicit list in the challenging short time avaialable to you. [Andreas Fischlin, Switzerland]	Text reworded and a list of systems is now provided
250	10	18	10	18	PUT "at" BEFORE 1.50 C than at..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
6448	10	18	10	18	1.5°C than at 2.0°C from our' should be 'at 1.5°C than at 2.0°C from our' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
31450	10	18	10	19	Regarding "that a 1.5°C climate is significantly different from a 2°C climate in terms of temperature extremes on global scale and in many regions": Does this sentence consist with P8,L31-L32 "Distinguishing between 1.5°C and 2°C is difficult in the short run and the impacts of 1.5°C global warming cannot be determined without some associated degree of uncertainty."? It needs to be clearly indicated which articles are referred, and what is the level of agreement as well as evidence. In case of low agreement and limited numbers of supporting articles and/or evidence, please specify so with appropriate scale of confidence since IPCC rule reads the IPCC works by assessing published literature. [Japan]	Not applicable. Text has been substantially revised.
35588	10	18			at 1.5oC than [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
60300	10	18	10	18	include "at" before 1.5°C in the beginning of the line [United States of America]	Not applicable - This section was rewritten
62608	10	18	10	18	Insert "at" at begin of line [Andreas Fischlin, Switzerland]	Not applicable - This section was rewritten
1230	10	19	10	19	should be "at global scales" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
6450	10	19	10	19	on global scale' should be 'on a global scale' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
52526	10	20	10	23	Suggested changes: "However, a global warming of 1.5°C poses a substantial risk to natural and human systems as compared to the present day warming of 1°C. Hence,a warming of 1.5°C cannot be considered a 'safe' option. This would require organisms to adapt (no evidence) or shift their biogeographic ranges or biomes (moderate confidence) in order to reduce or avoid the impacts of climate change." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
62612	10	20	10	20	Substantial risk has little meaning. Please rephrase and use IPCC uncertainty language. (similar argument I made re page 10, line 17) [Andreas Fischlin, Switzerland]	This has been rephrased
18240	10	21	10	23	A conclusion that has no clear evidence should not be reported in the executive summary and treated with caution in the main body of the report. [Andrea TILCHE, Belgium]	Text reworded and this phrase is deleted.
38658	10	21	10	23	I think this formulation ('safe' option) is too sloppy and un-nuanced. [Jan Fuglestvedt, Norway]	Agree, text reworded
41308	10	21	10	22	A bit difficult to understand-no evidence provided in the literature of organisms needing to adapt , but medium confidence inthem shifting biogeographical ranges or biomes? [Lourdes Tibig, Philippines]	Text reworded and this phrase is deleted.
49830	10	21	10	21	What is meant by "present day warming of 1C"? See related comment ch 3, p 9 l 6-7 where "2017" is used. [Erik Kjellström, Sweden]	Text reworded and this phrase is deleted.
2250	10	22	10	22	What does "no evidence" mean in this context? Does it mean that it is not supported by science, or that science supports another theory? Or does it mean that it is something that is just made up? Is it wise to include such a sentence in the summary? [Gustav Strandberg, Sweden]	Text reworded and this phrase is deleted.
3388	10	22			Delete 'requires organisms to adapt (no evidence) or'. What is the point of mentioning it if there is no evidence? [David Docquier, Belgium]	Reworded
4944	10	22	10	22	Is it really the case that "no evidence" exists? Is this referring to evolutionary adaptation or what? There are studies of birds, polar bears, etc. trying to change their diets, some successfully, some not, but always with difficulty. There also needs to be mention here about the rapid pace being required of species. In the past, the changes were generally slow and adaptation was possible in various ways. Here it needs to be said that rapid adaptation is bing needed compared to the past, and there really is little evidence this is possible (so where does the ?moderate confidence" come from? [Michael MacCracken, United States of America]	Text reworded and this phrase is deleted.
10378	10	22	10	22	organism make up biomes and can shift their biogeographic ranges leading to biome shifts but organisms can not "shift their biome" as suggested here [Christopher Reyer, Germany]	Text reworded
17644	10	22	10	22	Suggest removing "(no evidence)". [Sai Ming Lee, China]	Text reworded and this phrase is deleted.
21696	10	22	10	22	considered a safe option is a strange expression and should be changed into something more scientific. [Sweden]	Text reworded
60302	10	22	10	22	It is not clear what the "(no evidence)" refers to. Are the authors saying that there's no evidence of adaptation to date, or that there's no scientific evidence to support the finding that warming of 1.5°C will require organisms to adapt? The use of parentheses and italics makes it seem that the authors are referring to the latter option, which is hard to believe given the strength of the literature on the most vulnerable species (e.g., coral, high-altitude fauna). [United States of America]	Text reworded
35590	10	23			May be: 'will be not' instead of 'are to be' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
44906	10	23	10	23	Is this sentece right? Shouldn't 'if' be 'unless'? [Hiroaki Kondo, Japan]	Text reworded

Comment No	From Page	From Line	To Page	To Line	Comment	Response
4946	10	25	10	28	Overall, the English here needs smootihing and clarification. I would suggest starting the second sentence by saying: "While there will be significant impacts on many ecosystems with 1.5 C (with impacts already evident in many area at 1 C global warming), limiting warming to 1.5 C will not so seriously impact (very likely) terrestrial ..." Basically, there will be serious impacts at 1.5, and to characterize the impacts not getting much worse by saying that there will be "significant benefits" seems quite misleading to me. Basically, the situation is that the impact would be only horrible instead of horrendous--talking about "benefits" just seems inappropriate. [Michael MacCracken, United States of America]	Text reworded
21742	10	25			The expression "will carry significant benefits" could result in the false perception that a warming of 1.5º is a good thing. I think it is better (and closer to the proper message) to say that "1.5ºC will be much less damaging than that at 2ºC or more" [LUIS VALDES, Spain]	Reworded, but we have retained the use of the word 'benefits' to aid concise statements
32456	10	25	10	25	will carry significant benefits. The term "benefit" in this sense sounds positive, and as something to be aimed for. 1.5 degrees is not a benefit to coral reefs compared to current temperatures, with a projected die-off of 90%. Instead, rephrase to "reduced damages" and add "compared to 2.0C". [Rosanne Martyr-Koller, Germany]	Text reworded, but throughout the ES the word benefit is still used for conciseness in many places. The situation regarding coral reefs at 1.5C is made explicitly clear.
49726	10	25	10	33	In this paragraph, there is the conflict for the context. Firstly, it is said that 'Natural systems will experience fewer impacts when warming is limited to 1.5°C as opposed to 2.0°C', in this sentence it is defined that the discussion is limited to natural system, while in the following sentence it is said 'Limiting warming to 1.5°C will carry significant benefits for.....food production system (i.e., fisheries and aquaculture)', food production system is not a natural system. [Yinlong XU, China]	Text replaced with a more general statement encompassing both human and natural systems
49728	10	25	10	25	In sentence of 'Natural systems will experience fewer impacts when warming is limited to 1.5°C as opposed to 2.0°C',the word 'fewer' should be 'less'. [Yinlong XU, China]	Accepted - Sentence was reworded to ensure clarity
50648	10	25	10	40	Impacts on biodiversity and ecosystems under 1.5 depends on mitigation and adaptation pathways [Jagdish KRISHNASWAMY, India]	This issue is now discussed in the ES
54352	10	25	10	25	Add the word "Relatively" between "experience" and "fewer" [United Republic of Tanzania]	Accepted - Sentence was reworded to ensure clarity
57596	10	25	10	28	Make second sentence the bold headline as the first sentence has already been stated in bullet above [Hans Poertner, Germany]	Text reworded
62614	10	25	10	25	Bold text: The same argument applies as I made re page 10, line 17 (2 vs. 1.5). The bullet text itself is good and contains the substance I was asking for above. [Andreas Fischlin, Switzerland]	Thank you for this, the text was further improved.
35866	10	26	10	26	Replace 'significant benefits' with 'minimal impacts' as the overall negative effects may be less than that can occur at 2 degree C warming. For example in tropics, even 1.5 degree C will cause significant losses in systems that are in regions with near tripping points. [India]	Text reworded
40832	10	26	10	26	Consider replacing ' significant benefits' with 'minimal impacts' as the overall negative effects may be less than that can occur at 2oC warming. For example in tropics, even 1.5oC will cause significant losses in systems that are in regions with near tripping points. [NARESH KUMAR SOORA, India]	Text reworded
45588	10	26	10	28	Include 'compared to an increase of 2 ºC' at the end of this sentence [Adela M Sánchez-Moreiras, Spain]	Not applicable - This section was rewritten
46648	10	26	10	26	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Text reworded
60304	10	27	11	19	The text on page 11, lines 18-19, contradicts that of page 10 line 27. Throughout this report (in other chapters as well as this one), there is contradictory text that says (1) coral reefs will still disappear or face significant damages under 1.5°C, and (2) that coral reefs benefit from a 1.5°C world compared to 2°C. The entire report needs to be reviewed to clarify this point. The literature appears to suggest that the first statement (coral reefs face significant damages even under 1.5°C) is the correct one. [United States of America]	Accepted. The text is actually correct but has not been written very clearly. The issue is that - even though 1.5°C has very serious impacts on coral reef is - the impacts at 2°C are even higher. In a way analogous to Arctic sea ice, limiting the damage to coral reefs at 1.5°C to around 10-30% loss is a lot better than losing almost all coral reefs at 2°C of warming above the preindustrial period.
4948	10	28	10	29	Rephrasing needed to clarify what percentage changes in biome shifts mean [Michael MacCracken, United States of America]	Reworded
17260	10	28	10	29	The number of biome shifts? The extent of biome shifts? There is a LOT of this sort of vagary in this Chapter. [David Schoeman, Australia]	Accepted - Text was revised to improve the clarity throughout the executive summary
52528	10	28	10	29	Suggested change: "Constraining warming to 1.5°C versus 2°C is projected {section 3.4.1} to limit biome shifts towards high latitudes and/or altitudes by 10% rather than 25% on average." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
57032	10	28	10	28	double space ? "aquaculture). Constraining" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
57306	10	28	10	29	limit biome shifts does this refer only to terrestrial biomes?? [Hans Poertner, Germany]	Yes, and this is now included under the section on terrestrial ecosystems and marine ecosystems are discussed in another paragraph
4950	10	29	10	31	Dates for interglacials do not look to be correct. The Eemian interglacial was only a couple of thousand years long. And we are still in an interglacial, so what does it mean to say the interglacial was only 10-5 kyr BP?--and it is not at all clear that the global average temperature during these periods were up 1.5 C even if land temperatures were warmer as land temperatures warm more than the global average. [Michael MacCracken, United States of America]	10-5 kyr BP is the thermal maximum not the whole interglacial
9062	10	29	10	30	The sentence "Paleorecords show that during the previous interglacial periods (129–11 kyr BP, 10–5 kyr BP, equilavent to a 1.5°C warming), main shifts ..." contains incorrect data. It should be "Paleorecords show that during the last interglacial period (129–116 kyr BP) and the Mid-Holocene climate optimum (7–5 kyr BP) (equivalent to a 1.5°C warming), main shifts ..." [Alejandro Cearreta, Spain]	129-116 kyr BP is OK, but for the Holocene optimum, 10-5 kyr BP is more correct than 7-5 kyr BP
11974	10	29	10	29	Don't think 10% biome shift at 1.5°C warming appears anywhere in the main text - please check for consistency [United Kingdom (of Great Britain and Northern Ireland)]	Agree, text corrected
52530	10	29	10	31	Suggested change: "Paleorecords show that the main shifts observed during previous interglacial periods (129–11 kyr BP, 10–5 kyr BP, equilavent to a 1.5°C warming), were higher Arctic and Alpine treelines and the reduction of rainforests." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
3390	10	30			Typo: 'equivalent'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3704	10	30	10	30	I found this sentence very confuse. You talk about previous interglacial periods, but the first period you indicate represents a complete glacial cycle, and the second has been traditionally considered as the anathermic phase of the Holocene. In relation with the period 129-11 kyr BP, perhaps do you mean 129-116 kyr BP as shown in page 61? [Castor Muñoz Sobrino, Spain]	not anymore in the shortened version
17262	10	30	10	31	Main shifts…you would really only expect to detect large shifts in the deep past. Also, "were" is too not the right word…maybe "manifest as" or something similar? [David Schoeman, Australia]	Not applicable - This section was rewritten
31026	10	30	10	30	equivalent [Rafiq Hamdi, Belgium]	Not applicable - This section was rewritten

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56260	10	30	10	30	Most of the time period 129-11 kyr BP was glacial, and 10-5 kyr BP is the current interglacial period. Equivalent is also misspelled. [Annika Herbert, Australia]	sorry for the mistake, it is 129-116 kyr BP
4952	10	31	10	33	In that changes in season length are already more than a few days and global warming is only about 1 C, this statement seems like a significant understatement of how much change will prevail at 1.5 C, especially as the rest of the system adjusts to 1.5 C. [Michael MacCracken, United States of America]	Owing to the limited evidence on this the statement was removed from the ES
41310	10	31	10	33	Ambiguous [Lourdes Tibig, Philippines]	Owing to the limited evidence on this the statement was removed from the ES
49832	10	31	10	33	If the warming stops at 1.5C instead of 2C (if this is what is meant by "constraining" then it is strange if seasonal events occur earlier in spring. Also, some seasonal phenologial events are driven by sunlight and not by climate so it cannot be generalised. [Erik Kjellström, Sweden]	Owing to the limited evidence on this the statement was removed from the ES
52532	10	31	10	33	Suggested changes: "Constraining to a 1.5oC level will shift seasonal events a few days earlier in the spring, including the phenology of plants and animals, decreasing the risk of maladaptation (likely) to spring frost in temperate and boreal regions and more generally to climate variability." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56262	10	31	10	31	Reduction of rainforest what? [Annika Herbert, Australia]	Not applicable - This section was rewritten
57598	10	31	10	33	Decreasing the risk of maldatpation - Is this generally true? [Hans Poertner, Germany]	Owing to the limited evidence on this the statement was removed from the ES
60306	10	31	10	31	Reduction of rainforest area? What metric was reduced? [United States of America]	Text reworded
15854	10	33	10	33	What does 'more generally by climate variability' mean? [Australia]	Not applicable - This section was rewritten
46650	10	33	10	33	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Text reworded
57034	10	33	10	33	related to what ? "more generally by climate variability" [AMANDINE PASTOR, France]	Comment is not understood, text has been reworded here
1548	10	35			I realise the word "extirpation" has a well-defined biological meaning - but suspect it will not be familiar to a non-specialist audience. Since this is the summary section which will hopefully be read by non-experts, can "extirpation" be replaced by another word or series of words? [David Wratt, New Zealand]	Accepted. The term "extirpation" is no longer used in the ES.
4954	10	35	10	40	This bold heading really fails to make clear how much loss will be occurring if we allow 1.5 C to be the long-term equilibrium value. So, this point needs to make clear that there will be substantial losses at 1.5 C, even as the losses will be less than for 2 C. It just seems that context must be provided. For example, wildfire incidence at 1 C is significant, and at 1.5 C will be more. Yes this is less tan for 2 C, but the way this is all represented totally hides the important effects/impacts at 1.5 C [Michael MacCracken, United States of America]	The new section in the ES on reasons for concern indicates the level of risk at all levels warming between pre-industrial and 2C
13930	10	35	11	29	All the paragraphs need to be linked to a section: gaps here in the species on land, and the ocean impacts part. These paragraphs also need likelihood indicators. The paragraph on ecosystem services and 1.5 vs. 2 degrees looks especially vague without these indications, and hsould be removed if there is no reference to the sections below. [Natalie MAHOWALD, United States of America]	Agree, this has been done
15856	10	35	10	35	Replace "extirpation" with "extinction". [Australia]	Reworded
28184	10	35	10	35	Is there robust evidence for this statement? Suggest to rephrase, and also consider to delete the words "climatic range". [Germany]	The text has been reworded in the light of newly emerging literature
34004	10	35	10	35	Local species extirpation risks are much less in a 1.5°C versus a 2°C world. How is this reflected in figure SPM 6 "animal species loss?" If the species loss is reduced 50% in a 1,5 degrees scenario, why any risk (only red, not black) as shown in Figure SPM6? Please check consistency, and also include Figure SPM.6 in the apropriate chapter with supporting text. [Norway]	The text has been reworded in the light of newly emerging literature and Figure SPM6 has been redrawn
38660	10	35			Many readers may not be familiar with the word "extirpation". [Jan Fuglestvedt, Norway]	Accepted. The term "extirpation" is no longer used in the ES.
40148	10	35	13	26	This entire section of the ES has no reference to the sections of the chapter that relate, therefore, no traceable linkage to the ES. [Ko Barrett, United States of America]	This has been corrected in FGD.
55658	10	35	10	35	This message should be reflected in SPM [David Cooper, Canada]	This was reworded and elevated to the SPM
56598	10	35	10	35	is there a better known term than "extirpation"? (no idea what it's suppose to mean) [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
57310	10	35	10	40	Not clear how this will lead to higher level of ecosystem service provision. Also, does this refer just to terrestrial species? [Hans Poertner, Germany]	Reworded and placed under section on terrestrial ecosystems
62616	10	35	10	35	Bold text: What means "much less". Please rephrase using uncertainty language (2 vs. 1.5). [Andreas Fischlin, Switzerland]	The text has been reworded in the light of newly emerging literature
52536	10	36	10	36	Change to 'are' to 'would be'. [Charlotte Roehm, United States of America]	Accepted - Text was revised
57308	10	36	10	36	again be clear if this only applies to land plants, vertebrates and insects [Hans Poertner, Germany]	Reworded and clarified
62618	10	36	10	39	forest fires and storm damage have little to do with biodiversity unless you want to make a trivial statement such as every ecological process is directly or indirectly related to biodiversity. The latter is not helpful and I ask to rephrase the text more meaningfully and not based on trivialities. [Andreas Fischlin, Switzerland]	Reworded and related to section where effects of extreme events are discussed
6452	10	37	10	37	what is 'ecosystem service provision' ?? [Robert Shapiro, United States of America]	See glossary
10380	10	37	10	37	more approriate is to speak of a "reduced level of ecosystem service loss" [Christopher Reyer, Germany]	Accepted - Text was revised
28186	10	37	10	37	..leading to a higher level of ecosystem service provision - the level will surely not be higher than without a 1.5°C temperature rise. "…leading to a higher level of ecosystem service provision compared to a 2°C rise". Please revise. [Germany]	Reworded
39572	10	39	10	39	Please, consider revising the wording of: "The number of species at risk of commitment to eventual extinction ...". (Could it be shortened?) [Hernan Edgardo Sala, Argentina]	Text reworded
52534	10	39	10	39	Remove "commitment to' [Charlotte Roehm, United States of America]	Accepted - Text was revised
62620	10	39	10	40	What means "reduced"? Why in italics? Again the same argument applies, reduced significantly or not? Please give some reason why you have only low confidence, yet make the statement. Please rephrase also "commitment to eventual extinction", which is vague and unclear (instead use terms such as "committed to extinction", not "eventual extinction", cf. definitions in glossary of AR4 WGII). Finally also extinction risks might differ and should be discussed here, since there are not only 1.5°C overshoot scenarios, but also others, that need to be discussed here. Then I would expect that for some species and/or biocoenosis it should be possible to tell a difference between 2 vs. 1.5 in particular e.g. coral reefs. Think also of RFC 1. [Andreas Fischlin, Switzerland]	Text reworded

Comment No	From Page	From Line	To Page	To Line	Comment	Response
3706	10	40	40	41	In relation to the local species extirpation, the local/regional disappearance of species/ecosystems may be the most common real risk but not an eventual extinction of species (this means they are removed from everywhere). For exemple, we recently found that the regional warming combined with the sea level rise contributed to the demise of Carpinus from NW Iberia coastal ecosystems at the start of the Holocene. Nevertheless Carpinus has not been extinguised but survives in other areas. (Muñoz Sobrino, C., García-Moreiras, I., Gómez-Orellana, L., Iriarte-Chiapusso, M.J., Heiri, O., Lotter, A.F., Ramil-Rego, P. (2017). The last hornbeam forests in SW Europe: new evidence on the demise of Carpinus betulus in NW Iberia. Vegetation History and Archaeobotany, https://doi.org/10.1007/s00334-017-0654-7) [Castor Muñoz Sobrino, Spain]	Text reworded to explain how local species loss increases extinction risk (an increased risk does not imply actual extinction is predicted). Range loss is one of the IUCN criteria for extinction risk categories.
60308	10	40	10	40	Is there a special meaning for the italicized "reduced"? [United States of America]	Text reworded
15858	10	42	10	46	Rewrite this passage to make it more scientifically accurate: "Ocean acidification is driving large-scale changes in ocean chemistry and is amplifying the effects of temperature on organisms. Recent studies have revealed risks to the survival, calcification, growth, development, and abundance of a broad range of organisms (i.e. from algae to fish) with considerable evidence of trait-based sensitivities. While studies are limited but growing in number, is clear that ocean acidification at CO2 concentrations corresponding to 1.5°C will be much less damaging than those at 2°C or more." [Australia]	Accepted: summary statement now reads "The ocean has absorbed about 30% of the anthropogenic carbon dioxide, resulting in ocean acidification and changes to carbonate chemistry that are unprecedented in 65 million years at least (high confidence). Risks have been identified for the survival, calcification, growth, development, and abundance of a broad range of taxonomic groups (i.e. from algae to fish) with substantial evidence of predictable trait-based sensitivities. Multiple lines of evidence reveal that ocean warming and acidification (corresponding to global warming of 1.5°C of global warming) is expected to impact a wide range of marine organisms, ecosystems, as well as sectors such as aquaculture and fisheries (high confidence) {3.3.10, 3.4.4}. "
40168	10	42	10	46	Studies are limited for OA at 1.5 versus 2. Why address it here? And how can you justify saying "it is clear that ocean acidification that is equivalent to 1.5 C will be much less damaging that that at 2C or more? Unqualified conjecture without an assessment of literature. [Ko Barrett, United States of America]	We respectfully disagree. There are multiple lines of evidence that show that exposing organisms to higher levels of ocean acidification has negative consequences on physiological processes, ecosystems and in some cases, sectors. While many of the previous studies have been conducted in laboratory conditions, there are is a growing number of cases of field studies that show substantial impacts of ocean acidification. these multiple lines of evidence plus the impact of past changes (over past few decades) enable us to build an assessment of likely outcomes when comparing 2°C to 1.5°C, and 1.5°C to 1.0°C.
54354	10	42	10	42	The sentence" Ocean acidification is driving large scale changes" is not clear. Large scale changes in what? [United Republic of Tanzania]	Accepted: we have removed this summary statement and woven in the concept that ocean acidification is affecting a broad number of organisms, ecosystems and sectors. There is no need to have the original Summary statement as a result.
56600	10	42	10	46	refer to the fact that ocean acidification will depend strongly on 1.5 or 2 scenario as it's not temperature driven [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: we have rewritten the executive summary to be clearer on this issue.
57600	10	42	10	42	large scale changes in what? [Hans Poertner, Germany]	Accepted: we have removed this summary statement and woven in the concept that ocean acidification is affecting a broad number of organisms, ecosystems and sectors. There is no need to have the original Summary statement as a result.
60310	10	42	10	46	Suggest moving this key finding on ocean acidification to appear with the other 'oceans' and 'fisheries' findings on page 11. The current order is too choppy, with key findings switching from terrestrial to oceanic back to terrestrial issues. [United States of America]	Accepted: we have significantly reorganised the order of the summary statements in the current version of the executive summary.
62622	10	42	10	42	Insert "In many marine ecosystems " at begin of line. From algae to fish is too vague, please be more specific, e.g. as used by shell- or skeleton-forming, calcifying organisms such as coccolithophores, corals, pteropods, bova;ves.amd cephalopods etc. (see also what I wrote in the glossary of AR4 WGII under Aragonite, Calcareous organisms etc.). [Andreas Fischlin, Switzerland]	Accepted but have restrained the discussion to the topline messages given the fact that we were also requested to reduce the length of the executive summary by 50%. Statement stands at: "The ocean has absorbed about 30% of the anthropogenic carbon dioxide, resulting in ocean acidification and changes to carbonate chemistry that are unprecedented in 65 million years at least (high confidence). Risks have been identified for the survival, calcification, growth, development, and abundance of a broad range of taxonomic groups (i.e. from algae to fish) with substantial evidence of predictable trait-based sensitivities. Multiple lines of evidence reveal that ocean warming and acidification (corresponding to global warming of 1.5°C of global warming) is expected to impact a wide range of marine organisms, ecosystems, as well as sectors such as aquaculture and fisheries (high confidence) {3.3.10, 3.4.4}. "
28188	10	43	10	43	…survival, calcification, growth, development and abundance delete "calcification". Although it is a most important process (coral reefs, plankton..), it is comprised in the other verbs. Survival, abundance and development would be sufficient. [Germany]	We respectfully disagree. Calcification has been a central process in our understanding of the impacts of ocean acidification, especially from the altered covenant chemistry of seawater.
4956	10	44	10	45	It should be noted here that this answer likely varies depending on what the CO2 concentration is that is leading to the warming and the possible presence of offsets. For example, if sulfate cooling is allowed to persist, this would allow for higher CO2 and so a greater acidification problem than if SO2 emissions are cut and we only have 1.5 C as then much of the limitation would have had to come from cutting CO2 emissions. Also, if one were relying on climate intervention to offset the temperature increase, this might be allowing CO2 to be higher and doing more damage by acidification. Thus, I'd suggest perhaps a bit of qualificaiton in this sentence. [Michael MacCracken, United States of America]	We thank the reviewer for the interesting comment which we largely accepted as an interesting set of possibilities. However, it is not relevant with respect to the current executive summary.
57602	10	44	10	44	marine taxonomic groups? [Hans Poertner, Germany]	Accepted - Text was revised
251	10	45	10	45	.....in number, it is clear..... [Paul Doyle, Canada]	Not applicable - This sentence was revised
3392	10	45			Add 'it' before 'is'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6454	10	45	10	45	number, is clear that' should be 'number, it is clear that' [Robert Shapiro, United States of America]	Not applicable - This sentence was revised
15860	10	45	10	46	Please clarify this statement. Probably would prevent wide spread surface ocean aragonite undersaturation with 1.5oC than 2oC warming. [Australia]	Accepted but text removed when executive summary shortened.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17264	10	45	10	46	This sentence needs some grammatical attention. [David Schoeman, Australia]	Accepted - Text was revised
18242	10	45	10	46	How is it clear that ocean acidification in 1.5 will be much less damaging than 2, if there are limited scientific studies? Please elaborate. [Andrea TILCHE, Belgium]	We respectfully disagree. There are multiple lines of evidence that show that exposing organisms to higher levels of ocean acidification has negative consequences on physiological processes, ecosystems and in some cases, sectors. While many of the previous studies have been conducted in laboratory conditions, there are is a growing number of cases of field studies that show substantial impacts of ocean acidification. these multiple lines of evidence plus the impact of past changes (over past few decades) enable us to build an assessment of likely outcomes when comparing 2°C to 1.5°C, and 1.5°C to 1.0°C.
35592	10	45			…it is clear… [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
41312	10	45	10	46	Ambiguous (ocean acidification equivalent to 1.5°C?) [Lourdes Tibig, Philippines]	Accepted - Text was revised
44314	10	45	10	45	growing in number, it is clear that [Rita Man Sze Yu, China]	Not applicable - This sentence was revised
52538	10	45	10	46	Suggested change: "While studies are limited but growing in number, it is clear that ocean acidification resulting from a 1.5°C increase will be much less damaging than that resulting from increases of 2°C or more." [Charlotte Roehm, United States of America]	Accepted - Text was revised
56264	10	45	10	45	Change to: ", it is clear…." [Annika Herbert, Australia]	Not applicable - This sentence was revised
62624	10	45	10	46	Is it only the ocean acidification or the combination with less warming that makes the significant difference? I would have argued the former. Please rephrase accordingly. [Andreas Fischlin, Switzerland]	The interaction between temperature and certification is discussed in the main text of the chapter. We respectfully, disagree that we should be discussing these more nuanced issues here, especially given the request by many reviewers to shorten the length and complexity of our executive summary section.
39574	10	46	10	46	I suggest to replace "equivalent to 1.5°C" by "associated with 1.5°C" or "linked to 1.5°C". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised
1232	10	48	10	48	soil respiration and carbon storage increase with increasing temperature - please chaeck meaning of paragraph sentence, and following sentence. [Butt Nathalie, Australia]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
1342	10	48	11	3	What about carbon storage in that paragraph? It is mentioned in the title but not referred to in the text [Karen Olsen, Denmark]	We deleted reference to the carbon cycle in the ES
2242	10	48	11	3	The response of soil respiration has only one reference of a site-specific study in Australia (Muñoz-Rojas et al. 2016) and so I thick that it is premature to be included into Executive Summary. Otheriwse, revise the paragraph to mention 'soil decompositon', not 'soil respiration'. [Akihiko Ito, Japan]	Agree, we deleted reference to the carbon cycle in the ES
2306	10	48	11	3	First of all, I could not find a reference for these sentences in this chapter, so I could not find where these sentences came from. [Shoji Hashimoto, Japan]	We deleted reference to the carbon cycle in the ES
2308	10	48	11	3	The amounts of soil respiration and soil carbon stock do not necessarily go to the same direction. For example, an increase of soil respiration may reduce the amount of soil carbon stock. So, these sentences are confusing. [Shoji Hashimoto, Japan]	We deleted reference to the carbon cycle in the ES
2310	10	48	11	3	I could not find the reference of "historical records" paper. The last sentence is unclear in meaning. Do you mean the acceleration of soil carbon stock release by warming is higher than the increase of soil carbon stock by the fertilizer effect? If so, this is still in debate. I thought this sentence was based on a limited number of study. I think the future of soil respiration and soil carbon stock (budget) should be described more carefully. [Shoji Hashimoto, Japan]	We deleted reference to the carbon cycle in the ES
6158	10	48	11	3	What about carbon storage in that paragraph? It is mentioned in the title but not referred to in the text [Anne Olhoff, Denmark]	We deleted reference to the carbon cycle in the ES
6456	10	48	10	48	with temperatures increase' should be 'with temperature increase' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10382	10	48	10	48	I think soil respiration increases with warming hence reducing soil carbon storage. This sentence reads as if soil respiration would decrease with warming [Christopher Reyer, Germany]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
12800	10	48			Sentence should read "Soil respiration and soil carbon storage are reduced with increases in temperature." [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
12802	10	48	10	49	In the sentence "This reduction will occur at lower rates a 1.5°C global warming…" a "for" is missing before a 1.5°C. It should read "This reduction will occur at lower rates for a 1.5°C global warming…" [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
18244	10	48	11	3	What about carbon storage in that paragraph? It is mentioned in the title but not referred to in the text [Andrea TILCHE, Belgium]	We deleted reference to the carbon cycle in the ES
21724	10	48	11	3	Unclear. The language should be revised. [Sweden]	Not applicable - This section was rewritten
28190	10	48	10	48	Unclear or too complicated: "Soil respiration *is typically increased* [with increasing temperature] and then soil carbon storage "is" reduced …." [Germany]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
28192	10	48	11	3	Does this statement hold true, when socio-economic, especially landuse issues come into play? The emission of CO2 under warmer temperatures seems indeed very likely. The enhanced biomass growth (terrestrial and aquatic) depend - at least for the terrestrial part - also on land-use decisions (e.g. scale and timeframe of deforestation/afforestation, land degradation). See also Ch 3 p. 177 Blue Box Cross-Chapter 3.1, Table 1. [Germany]	We deleted reference to the carbon cycle in the ES
31452	10	48	11	3	This statement is rather contradictory because soil respiration reduces carbon storage. In fact, ample evidence exists that soil respiration is enhanced by increased temperature (DOI:10.1111/gcb.13489, Figure 2; doi/10.1073/pnas.1521479112, Figure 3D): this reduces carbon sink. In the following sentences, modifiers are misplaced so the meaning is not clear. We, therefore, propose that this section be modified to read "Soil respiration and then soil carbon loss are increased with temperature increase. This increase will occur at lower rates at a 1.5 °C global warming than at a 2.0 °C warming, but is likely to be balanced by gross primary production enhanced by CO2 fertilization and higher temperature. Nevertheless, historical records show that soil respiration increase by warming is higher than the CO2 fertilization effect.". [Japan]	We deleted reference to the carbon cycle in the ES
32458	10	48	10	48	Soil respiration and then …: change 'then' to 'subsequent' [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten

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44908	10	48	10	48	Soil carbon storage reduced with temperature increase, but soil respiration increases. Soil resporation release carbon in the soil to atmosphre. [Hiroaki Kondo, Japan]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
46012	10	48	10	48	Soil respiration and then soil carbon storage are reduced with temperatures increase. I would say: An increasing soil respiration will reduced carbon storage… [Tim Rixen, Germany]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
52540	10	48	10	48	Change to: "Both soil respiration and soil carbon storage will decrease with an increase in temperatures." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
57604	10	48	10	48	Doesn't soil respiration increase with temperature ? [Hans Poertner, Germany]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
62626	10	48	10	48	with increasing temperatures or "with temperature increase" but not "with temperatures increase". [Andreas Fischlin, Switzerland]	Not applicable - This section was rewritten
62628	10	48	11	3	The statement is difficult to follow, since not logical due to the fact that soil respiration and SOC respond in general in an opposite manner with warming. Please correct. In last sentence it is very unclear what is meant: with respiration reduction vs. fertilication effect, i.e. under warming or when comparing 2 vs. 1.5 (less warming)? [Andreas Fischlin, Switzerland]	We deleted reference to the carbon cycle in the ES
252	10	49	10	49	.....at lower rates at 1.50 C global warming,..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
4958	10	49	10	49	This needs to say "at lower rates than a 1.5 C" [Michael MacCracken, United States of America]	Not applicable - This section was rewritten
6458	10	49	10	49	will occur at lower rates a 1.5°C' should be 'will occur at lower rates at 1.5°C' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
35594	10	49			May be: 'under a 1.5°C global warming' instead 'at lower rates a 1.5°C global warming' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
44316	10	49	10	49	lower rates at 1.5" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
46652	10	49	10	49	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	We deleted reference to the carbon cycle and soil respiration in the ES as the literature lacks clear information specific to making comparisons of the implications of 1.5/2C warming
50772	10	49	10	49	...at lower rates 'with / at' 1.5oC global warming..... instead of "...at lower rates a 1.5oC global warming....." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
60312	10	49	10	49	will occur at lower rates a 1.5C unclear. Consider revising. [United States of America]	Not applicable - This section was rewritten
6460	11	1	11	1	production due to fertilization effect' should be 'production due to a fertilization effect' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
52542	11	1	11	1	Change to: "…to the fertilization effect and to higher temperatures under higher CO2 concentrations, especially in mid- and high latitudes." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
17266	11	2	11	2	Here, and elsewhere, avoid constructing compound nouns like "soil respiration reduction"; failing this, at least hyphenate correctly. [David Schoeman, Australia]	Not applicable - This section was rewritten
44910	11	2	11	2	soil respiration reduction --> soil carbon storage reduction [Hiroaki Kondo, Japan]	We deleted reference to the carbon cycle in the ES
49834	11	2	11	2	Which "historical" period is referred to here? [Erik Kjellström, Sweden]	We deleted reference to the carbon cycle in the ES
52544	11	2	11	3	Change to: "Nevertheless, historical records show that the reduction in soil respiration is higher than the fertilization effect." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
60314	11	2	11	2	Medium or mid-latitudes? [United States of America]	We deleted reference to the carbon cycle in the ES
1550	11	5	11	6	I suggest thesed sentences should be rewritten as "NORTHERN HEMISPHERE high latitude regions will see amlified differences …average. Habitats at high NORTHEN HEMISPHERE latitudes will see …". (I don't think polar amplification is proven for the Antarctic for a warming of 1.5 to 2°C above pre-indistrial? I understand it is not occuring so far at Southern latitudes?) [David Wratt, New Zealand]	Rejected – while projected Antarctica warming is certainly less than Arctic, figures in 3.3.1 suggest that there is some southern polar amplification so that it cannot be ruled out in the way the reviewer suggests.
9564	11	5			Can the word "Arctic" be used here to be clear about the region being discussed? "High latitude regions" doesn't communicate as clearly the message that the Arctic will see (and is already experiencing) HUGE differences in impacts from warming. It is a very important message and should be stated very clearly to indicate that the region discussed here includes the Arctic. [Joanna Petrasek MacDonald, Canada]	Noted – prefer to retain wording because impacts will be larger than global mean for both Arctic and Antarctic.
45590	11	5			Include more information about impact of permafrost melting on warming increase. Regarding greenhouse gases emission, a study suggested that 130-160 billion tons of carbon could be released from melting permafrost during the next 80 years (Schuur et al., 2015) [Adela M Sánchez-Moreiras, Spain]	Noted - emission are discussed more fully in Chpt 2
52546	11	5	11	9	How does this compare with the current coverage of permafrost? Continuous permafrost limits have already shifted nearly 100 km north. What is the consequence of the change in permafrost - i.e. how much C does this storage save in terms of its positive feedback on warming? This context would be interesting in a short sentence. [Charlotte Roehm, United States of America]	Noted - emission are discussed more fully in Chpt 2
55984	11	5	11	6	Suggest, "…due to warming rates current;y observed and projected and 2-3 times the global average." [Pamela Pearson, United States of America]	Not applicable - This sentence was rewritten
57606	11	5	11	5	should this be amplified impacts? [Hans Poertner, Germany]	Accepted - Text was revised to clarify
62630	11	5	11	9	The bold text needs to refer to 2 vs. 1.5 and can't hide this only in the text. [Andreas Fischlin, Switzerland]	Text reworded
35596	11	6			weaker or smaller' is better than 'reduced' [Roman Corobov, Republic of Moldova]	Accepted - Text was revised
4960	11	7	11	9	It needs to be made explicit here that this really only applies if there is no overshoot--if there is overshoot, then there will be much greater loss and it is not really clear that bringing the temperature back down will limit the loss to the 1.5 C level--in fact, that may well be unlikely, especially if the overshoot lasts for a decade or more, as would seem inevitable. [Michael MacCracken, United States of America]	It needs to be made explicit here that this really only applies if there is no overshoot--if there is overshoot, then there will be much greater loss and it is not really clear that bringing the temperature back down will limit the loss to the 1.5 C level--in fact, that may well be unlikely, especially if the overshoot lasts for a decade or more, as would seem inevitable.
46868	11	7	11	9	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - Text was revised to ensure consistent use of calibrated language throughout the report
55660	11	7	11	8	restraining temperature to 1.5C, versus 2C, will prevent …. [David Cooper, Canada]	Accepted - statement substantially revised in FGD.
55986	11	7	11	9	Express also in terms of carbon release (Gt) per Schuur et al and other studies noted in Ch. 2 111-112 as noted above. Also, unsure of course that carbon release will take "centuries" (?) -- although there will be no "burst," C release primarily occurs often within a season of thaw, especially in extreme heat events? [Pamela Pearson, United States of America]	Noted - emission are discussed more fully in Chpt 2

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56602	11	7	11	9	logic? If it's prevented from thawing carbon is not released I assume [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised
57608	11	7	11	7	How will hibernation and migration change? [Hans Poertner, Germany]	This level of detail belongs in AR6
57610	11	7	11	9	New bullet point, worth including a sentence on feedback to climate [Hans Poertner, Germany]	Noted - emission are discussed more fully in Chpt 2
9376	11	8	11	8	terminology issue - permafrost thaws it does not melt [Sharon Smith, Canada]	Accepted.
9378	11	8	11	9	Statement seems to assume all thawing permafrot will release carbon - thawing permafrost is not equivalent to thawing carbon. Perhaps you meant to say thawing of permafrost may continue for many centures which may release considerable amounts of carbon. [Sharon Smith, Canada]	Noted - emission are discussed more fully in Chpt 2
11976	11	8	11	8	Please check for consistency - the main text says several times that 4 million km^2 of permafrost will be prevented from melting by restricting warming to 1.5°C, not 2 million km^2. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - statement substantially revised in FGD.
49836	11	8	11	8	When is this prevented melting applicable? At the time of 1.5C? At 2100? In the long run (centuries to millennia?)? [Erik Kjellström, Sweden]	Accepted - statement substantially revised in FGD.
55784	11	8			“melting” ? “thawing” [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Rejected - melting is also correct
1234	11	9	11	9	should also mention methane release from thawing of permafrost? [Butt Nathalie, Australia]	Noted - emission are discussed more fully in Chpt 2
35868	11	9	11	9	The line reads '..Linear associations between…' Citations may be added to substantiate this statement, as most research shows that associations between temperature and outcomes on health etc. are non-linear in nature. [India]	Rejected - seems to related to a different line - no mention of linear here
46654	11	9	11	9	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Agreed.
55786	11	9			“this thawed carbon” ? “the thawed carbon” [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised
62632	11	9	11	9	There is nothing like 'thawed carbon' [Andreas Fischlin, Switzerland]	Accepted - Text was revised
1344	11	11	11	13	What is described here is not really a tipping point [Karen Olsen, Denmark]	not anymore present in the shortened version
6160	11	11	11	13	What is described here is not really a tipping point [Anne Olhoff, Denmark]	not anymore present in the shortened version
62634	11	11	11	12	The bold text needs to refer to 2 vs. 1.5 and can't hide this only in the text. [Andreas Fischlin, Switzerland]	Accepted: bold removed.
1236	11	12	11	12	should be "above which the…" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
3708	11	12	11	13	Again I found this sentence a bit confuse. Of course this document is a global synthesis that must assume its own definitions of global warming (explained in the previous chapters). The problem is that ecosystems/biomes experience changes according their own local conditions but not in relation to a global 1.5ºC or 2ºC warming. Thus, many biomes in South Europe have experienced changes of 2ºC during the Holocene. To avoid misunderstandings I suggest to say biota but not biome (really there are a number of biomes that can be described in the Mediterranean area). [Castor Muñoz Sobrino, Spain]	This is not only true for this box but for all the report: locally the warming is different and in the Med, it is higher. The word biome is not anymore in the shortened version
4962	11	12	11	13	This finding seems to violate the lexicon/confidence lexicon--basically, it is saying there is high confidence that something unprecedented in 10,000 years is possible. Is that really what is intended, given I think it was said that high confidence is generally associated with events that are either (very) likely or (very) unlikely. And why is the limit 10,000 years--beyond that time the region was likely quite cold and yet here it is making it seem as if the same type of change might occur for warming as for cooling--or is the point just that there would be a big change? [Michael MacCracken, United States of America]	It is limited to 10,000 yr because the reference paper is about it; but this part has been removed for shortening reasons
31454	11	12	11	12	Describing impacts only in the Mediterranean seems inappropriate. We recommend to describe the reason or to add explanations for other regions. Also, if there is bias in the available literature, it should be written as "The previous analysis is focused on the XX area and according to the analysis, it should be the Mediterranean". [Japan]	Med region is presented in a box as a exemplary of a strong vulnerability and various adaptation responses
6462	11	13	11	13	biome experiences changes that are' should be 'biomes experience changes that are' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
39576	11	13	11	13	Consider to insert "would" between "biome" and "experiences" (with the aim to emphasize its potential nature). [Hernan Edgardo Sala, Argentina]	this part has been removed for shortening reasons
46870	11	13	11	13	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	this part has been removed for shortening reasons
4964	11	15	11	19	There are no confidence levels given to some pretty specific findings. On the coral reef sentence, should there not also be mention of the CO2 effect (and a bit strange that the CO2 and temperature impacts on coral are not treated in the same finding). [Michael MacCracken, United States of America]	Accepted: We have systematically provided confidence levels for each statement in the executive summary.
10006	11	15	11	19	This part is recycled from the impact of the 2.0oC on the ocean. The claim on the unprecedent changes on ocean need to be referenced with studies on 1.5oC [Saudi Arabia]	Accepted: the relevant statement has been removed. On the more general point of properly referencing statements and comparisons, we largely agree. In this regard, we have worked hard to ensure that references to today (0.87°C), 1.5°C and 2°C are properly referenced and supported.
15862	11	15	11	15	Rewrite as "Oceans are experiencing changes unprecedented in the instrumental record" (we don't know absolutely if they are unprecedented in geological time). [Australia]	Text has been removed and reorganised and no longer includes this phrase.
31456	11	15	11	32	Describing impacts only in the Mediterranean seems inappropriate. We recommend to describe the reason or to add explanations for other regions. Also, if there is bias in the available literature, it should be written as "The previous analysis is focused on the XX area and according to the analysis, it should be the Mediterranean". [Japan]	Med region is presented in the first paragraph as a exemplary of a strong vulnerability and various adaptation responses
46014	11	15	11	19	I strongly recommend provide confidence levels to these statements [Tim Rixen, Germany]	Accepted: We have systematically provided summary statements for each statement in the executive summary.
62636	11	15	11	19	This bullet needs to be integrated into bullet on local species extirpation (page 10, line 35..40) [Andreas Fischlin, Switzerland]	Accepted but we have restructured, reorganised and have rewritten the executive summary in line with the many helpful comments and suggested changes.
35598	11	16			changes in water [Roman Corobov, Republic of Moldova]	Accepted - Text was revised
17268	11	17	11	17	Ecosystems don't "move", ranges of their constituent species shift. This is a subtle difference, but is important in communicating the essence of the science. [David Schoeman, Australia]	Accepted: use of the term 'shift' adopted with respect to ecosystems.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
30440	11	17	11	17	« relatively less able to move » We would suggest to use "adapt" here, as some species can adapt without moving. [France]	Rejected - this sentence is referring to ecosystems which availability to relocate is limited.
54624	11	17	11	18	The sentence 'Other ecosystems are relatively less able to move, however, and will experience high rates of mortality and loss' is unclear. Rephrase to 'Other ecosystems, relying on fixed or poorly mobile fauna are relatively less able to adapt, however, and will experience high rates of mortality and loss' [Nadine Le Bris, France]	Rejected - sentence was clear. Small edit was made
5570	11	18	11	19	please write the level of confidence of this statement [Sandra CASSOTTA, Denmark]	Accepted: We have systematically provided confidence levels for each statement in the executive summary.
12804	11	18	11	19	In the sentence "A large portion of the coral reefs… as average global surface…" a "the" is missing between as and average. It should read "…as the average global surface temperature reaches…" [Marie-Jeanne S. Royer, Canada]	Not applicable - This sentence was rewritten
34006	11	18	11	19	A large portion of the coral reefs….. this concerns tropical coral reefs and not cold water corals. Please include "tropical" in the sentence. [Norway]	Accepted: text modified.
41314	11	18	11	19	No confidence levels? [Lourdes Tibig, Philippines]	Accepted: We have systematically provided confidence levels for each statement in the executive summary.
60316	11	18	11	19	The sentence "A large portion of the coral reefs that exist today will disappear as average global surface temperature reaches 1.5°C above preindustrial levels, for example." seems inconsistent with language in the prior key finding on page 3-10, lines 26-27 – i.e., "Limiting warming to 1.5°C will carry significant benefits (very likely) for terrestrial, wetland, coastal, and ocean ecosystems including coral reefs, freshwater systems ...". [United States of America]	We respectfully disagree. Two sentences are correct. The first refers to the fact that we will still lose lots of coral reefs even though we are able to restrain 1.5°C above the preindustrial. The second is simply making the point that even though 1.5°C has serious ramifications and impacts, achieving 2.0°C of global warming will carry even worse consequences. We have worked hard to try and make this message clearer.
52548	11	19	11	19	Add an 's' to 'temperature'. [Charlotte Roehm, United States of America]	Not applicable - This sentence was rewritten
15864	11	20	11	20	Add new summary paragraph specifically about impacts and risks to coral reef ecosystems, given they are considered later in the chapter and are one of the most vulnerable ecosystems and there is growing body of knowledge about impacts and risks. [Australia]	We respectfully disagree. Coral reefs feature prominently in the executive summary (SOD and FGR versions). This is also not possible given space - many reviewers requested a halving of the length of our executive summary. Adding another summary statement in this case would only exacerbate that issue.
41318	11	21	11	27	No confidence levels? [Lourdes Tibig, Philippines]	Accepted: We have systematically provided confidence levels for each statement in the executive summary.
46016	11	21	11	27	I strongly recommend provide confidence levels to these statements [Tim Rixen, Germany]	Accepted: We have systematically provided confidence levels for each statement in the executive summary.
41316	11	22	11	23	You may consider inserting the word "mean" between "global" and "temperatures" [Lourdes Tibig, Philippines]	Not applicable - This sentence was rewritten
52550	11	23	11	23	Change 'of 3 billion' to 'to 3 billion'. [Charlotte Roehm, United States of America]	Not applicable - This sentence was rewritten
4966	11	25	11	26	It is a bit strange that there is no mention here of sea level rise, increased likelihood of storm surges and inundation, etc. that would also be affecting coastal communities. [Michael MacCracken, United States of America]	Noted - SLR is dealt with in a separate point (31).
1238	11	26	11	26	remove "Nevertheless" [Butt Nathalie, Australia]	Not applicable - This sentence was rewritten
52552	11	26	11	27	This sentence seems to portray the advantages of a 1.5oC world. Suggest changing this to say: "While the advantages of a 1.5oC world are clear, impacts will be likely observed below this threshold of temperature change." [Charlotte Roehm, United States of America]	Accepted: text has been changed.
62638	11	27	11	27	avoid a phrase such as "consistent with" in the impact context [Andreas Fischlin, Switzerland]	Accepted - Text was revised
3684	11	29	11	32	The conclusion on ecosystem service doesn't tell the difference between 1.5 and 2? target. Please revise it accordingly [Ying Chen, China]	Accepted and rewritten to be clearer: "Current ecosystem services from the ocean will be reduced at 1.5ºC, with losses being greater at 2ºC (high confidence). The risks of declining ocean productivity, shifts of species to higher latitudes, damage to ecosystems (e.g. coral reefs, as well as from mangroves, seagrass and other wetland ecosystems), loss of fisheries productivity (at low latitudes), and changing ocean chemistry (e.g., acidification, hypoxia, dead zones), however, are projected to be substantially lower when global warming is limited to 1.5°C (high confidence) {3.4.4, Box 3.4}. "
4968	11	29	11	29	This seems an essentially obvious statement with no real explanations of why, etc. It also provides no sense of how damaging a 1.5 C warming would be. And no confidence levels, even though it is obvious that 1.5 C will be less than 2 C. Just a pretty useless statement. [Michael MacCracken, United States of America]	Accepted: text has been changed.
15866	11	29	11	29	The ecosystem services from the ocean are diminished under 1.5oC and greater warming. As a blanket statement this may not be valid. Arctic and Antarctic Oceans with less sea-ice cover may deliver more of some types of ecosystem services than they do now. [Australia]	We respectfully disagree. There are multiple lines of evidence suggesting that ecosystem service will be greater at 1.5°C when compared to those at 2.0°C. We have also discussed in the main body of the text some examples where there may be temporary benefits arising from warming (high latitude fisheries being one example). There is a very large number of other examples which show reduced ecosystem services at 2°C versus 1.5°C, thereby justifying this important, general statement.
31460	11	29	11	32	Assumptions regarding impacts on ecosystems due to development should be stated to explore relationship between impact of economies development and the one of climate change. [Japan]	Accepted: text has been changed.
31458	11	29	11	32	We are not sure which services are included in the term “ecosystem services” in the first sentence. If the sentence addresses food provisioning service, we suggest that this paragraph be integrated with previous paragraph as both paragraphs appear to be very similar. If authors' intention is to include other services, please provide a clear description of the meaning of “ecosystem services” . [Japan]	Accepted and rewritten to be clearer: "Current ecosystem services from the ocean will be reduced at 1.5ºC, with losses being greater at 2ºC (high confidence). The risks of declining ocean productivity, shifts of species to higher latitudes, damage to ecosystems (e.g. coral reefs, as well as from mangroves, seagrass and other wetland ecosystems), loss of fisheries productivity (at low latitudes), and changing ocean chemistry (e.g., acidification, hypoxia, dead zones), however, are projected to be substantially lower when global warming is limited to 1.5°C (high confidence) {3.4.4, Box 3.4}. "

Comment No	From Page	From Line	To Page	To Line	Comment	Response
46018	11	29	11	32	I strongly recommend provide confidence levels to these statements [Tim Rixen, Germany]	Accepted: We have systematically provided confidence levels for each statement in the executive summary.
62640	11	29	11	32	Vague bold text, since some provisioning services were addressed above (previous bullet). Merge with that bullet or start discussion of some ecosystem services as stated here very generally earlier. I am of the view that biodiversity maintenance is also an ecosystem service (supporting service). (2 vs. 1.5) [Andreas Fischlin, Switzerland]	Accepted and rewritten to be clearer: "Current ecosystem services from the ocean will be reduced at 1.5ºC, with losses being greater at 2ºC (high confidence). The risks of declining ocean productivity, shifts of species to higher latitudes, damage to ecosystems (e.g. coral reefs, as well as from mangroves, seagrass and other wetland ecosystems), loss of fisheries productivity (at low latitudes), and changing ocean chemistry (e.g., acidification, hypoxia, dead zones), however, are projected to be substantially lower when global warming is limited to 1.5°C (high confidence) {3.4.4, Box 3.4}. "
52554	11	31	11	32	Remove brackets: "...are lower when warming (and corresponding atmospheric greenhouse gas concentrations) are restrained to 1.5°C above pre-industrial levels." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
1346	11	34	11	39	With unsustainable management the described risks also exist today - even without climate change. This needs to be mentioned [Karen Olsen, Denmark]	Not applicable - text has been revised
4970	11	34	11	39	It needs to be said that even at present warming, the regions are already being stressed--and 1.5 C will make it worse, and the 2 will make it much worse. The idea of 1.5 C as the long term equilibrium value needs to be critiquing soundly--the agreement was to try to stay below 1.5 C, not to have the new equilibrium be 1.5, and here is an opportunity to indicate that just being at 1.5 or even 1 C is problematic. [Michael MacCracken, United States of America]	Not applicable - text has been revised
6162	11	34	11	39	With unsustainable management the described risks also exist today - even without climate change. This needs to be mentioned [Anne Olhoff, Denmark]	Not applicable - text has been revised
17270	11	34	11	35	Here and elsewhere, are headline points synthetic, or merely an opening sentence? There seems to be no consistency in this regard. [David Schoeman, Australia]	Not applicable - This section was rewritten
18246	11	34	11	39	Is the risk to food security mostly deriving from unsustainability of the agricultural system? What about the drivers of risk even without climate change - and the interplay between climate change impacts and unsustainable agricultural practices? [Andrea TILCHE, Belgium]	Not applicable - text has been revised
21698	11	34	11	34	reduces … stress probably refers to the stress level at 2 deg warming, not in absolute terms relative to 1980-2009. Please clarify. [Sweden]	Not applicable - This section was rewritten
31462	11	34	11	35	We would like to request more explanation on the reason why the global water resources stress will decrease by 50% in 1.5°C compared with that in 2°C. The meaning of “50%” is not clear. Provide the indicator used to estimate water resources stress, and define the meaning of water resources stress, years, and assumption for adaptations. [Japan]	Taken into account. Supporting information is included in the subsection 3.4.2 and its supplement.
41320	11	34	11	35	No confidence levels? [Lourdes Tibig, Philippines]	Accepted. Confidence levels are added.
62642	11	34	11	35	What is "global water resources stress"? And what are 50% of it? From the text I can guess you are talking about stress resulting from reduced water availability for plants on land (from the bold text I expected you are talking about marine systems). Needs complete rephrasing into a carefully drafted text that makes sense. (2 vs. 1.5) [Andreas Fischlin, Switzerland]	Accepted - text has been revised
6976	11	35	11	38	West Asia is one of the areas that is heavily affected by water resource stress. So it is suggested that this area be taken into account. [maryam karimian, Iran]	Not applicable - text has been revised
9160	11	35	11	38	West Asia is one of the areas that is heavily affected by water resource stress. So it is suggested that this area be taken into account. [Rahele Modirian, Iran]	Not applicable - text has been revised
7288	11	35	11	35	Are the projections for large changes to water resource stress in the Mediterranean robust? (e.g. Fig 3.6?). While I agree most studies of climate change impacts indicate precipitaiton and runoff decreases in this region, we (Donnelly et al. 2017) were unable to robustly show any difference betwen 1.5 and 2 C in the European Mediterranean except for around the Iberian Coast. (for mean runoff and low runoff, Q10). This may be due to different ensembles being used, or due to the fact that we looked at dynamically downscaled and bias-adjusted precipitaiton. I'm not saying our study was right (like all others its highly uncertain). Nevertheless, this would make me hesitant to highlight this as a considerable change we are confident in. (See also pp3-37, lines 13-16: do these studies also indicate large decreases in mean precip and hence water stress for that region? page 3-66, lines 11-17 , also Section 3.5.2.2.3, Table 3.7) [Chantal Donnelly, Australia]	Not applicable - text has been revised
52556	11	35	11	38	Suggested change: "In food production systems, limiting warming to 1.5°C rather than 2oC above pre-industrial levels, significantly reduces risks to crop production in Sub-Saharan Africa, West Africa, SE Asia, and Central and South America." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
39578	11	36	11	36	I suggest to replace "preindustrial" by "pre-industrial", in order to keep consistency of language along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
49838	11	36	11	39	This is about food production which is covered on p 12. Also, the language is strange - what is "risk for food production"? (should it be "risk of failure of …"?) [Erik Kjellström, Sweden]	Not applicable - text has been revised
253	11	38	11	38	In regions with unsustainable growth..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
1240	11	38	11	38	region should "regions" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
6464	11	38	11	38	In region with unsustainable agriculture, such as in Middle East' should be 'In regions with unsustainable agriculture, such as in the Middle East' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
35298	11	38	11	38	Should read: "in regions" [Ana Bastos, France]	Not applicable - This section was rewritten
52558	11	38	11	38	Add 's' to 'region'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56266	11	38	11	38	Change "region" to "regions". [Annika Herbert, Australia]	Not applicable - This section was rewritten
56268	11	38	11	38	Change to "the Middle East…" [Annika Herbert, Australia]	Not applicable - This section was rewritten
60318	11	38	11	38	Consider revising "such as in Middle East" to "such as in the Middle East" [United States of America]	Not applicable - This section was rewritten
10384	11	39	11	39	this paragraph is not about extreme poverty. Maybe mke the link between extreme poverty being related to food production? [Christopher Reyer, Germany]	Accepted - text has been revised

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4972	11	41	11	45	This does not just apply to small islands, but also to many coastlines, especially developed coastlines and urban regions. This expanded scope needs to be mentioned. Regarding the last sentence, it needs to be said that early adaptation might ve successfully accomplished with levees in some regions, but long-term adaptation will require significant retreat from the coastal edge to avoid inundation (and if sea level sensitivity is really of order 15 meters per degree, this would involve very extensive retreat and relocation) in many regions around the world. [Michael MacCracken, United States of America]	Accepted - Also added deltas. Point 30 now covers adaptation generically.
35600	11	41			…on groudwater [Roman Corobov, Republic of Moldova]	Accepted - Text was revised
52560	11	41	11	42	Suggest changing to: "Impacts associated with sea level rise and salinity changes in groundwater or estuary systems, are particularly important in sensitive environments such as small islands." [Charlotte Roehm, United States of America]	Accepted - Section was revised
62644	11	41	11	42	add at end of bold text "and many coastal freshwater systems". [Andreas Fischlin, Switzerland]	Noted - small islands are now dealt with exclusively in a point in its own. It notes multiple impacts.
3404	11	42			Replace 'Sea-levels' by 'Sea levels'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
52562	11	42	11	45	Suggested change: "Sea-levels will not stop rising with temperature stabilisation at 1.5°C or 2°C. These changes are predicted to result in salinization, flooding, permanent inundation, storm damage, and erosion. Further, impacts on ecosystems will continue to get worse well beyond the end of the century. Over multi-centennial timescales, adaptation remains essential." [Charlotte Roehm, United States of America]	Accepted - Section was revised
254	11	43	11	44	.....which indicates that.....erosion and degradation of ecosystems will continue to worsen well beyond..... [Paul Doyle, Canada]	Accepted - Section was revised to clarify
3406	11	43			Replace 'which predicts' by 'meaning'. [David Docquier, Belgium]	Accepted - Text was revised
62646	11	44	11	44	which ecosystems? [Andreas Fischlin, Switzerland]	Not applicable - This sentence was deleted
9734	11	45	11	45	Please add section reference. [Alexander Nauels, Australia]	Accepted - Section has been added
62648	11	45	11	45	This sentence makes no sense to me. Please rephrase to an understandable text. [Andreas Fischlin, Switzerland]	Noted - Sentence has been reworded by adding in the timescale of today first.
4974	11	47	12	4	It needs to be made clear that the types of adaptation here will only be possible if the rate of rise of sea level stays low, and for this to be likely, it would seem that the global average temperature has to be returned to lower values than at present, and not allowing equilibrium at 1.5 C, much less any overshoot. [Michael MacCracken, United States of America]	Noted - now more 1.5deg focused to illustrate low rates.
6050	11	47	11	48	Does this relate to preservation of existing natural coastal ecosystems or restoration of ecosystems back to nature? [Timothy Carter, Finland]	Accepted, clarification added.
28194	11	47	11	47	Suggest to revise slightly: Natural coastal ecosystem restorations may be cost effective solutions… [Germany]	Noted - It isn't just restoration, it is all ecosystems. Clarification added in line with comment 6050.
31464	11	47	11	48	This sentence provides important information. However, the reader may be somewhat confused because this section (from Page 10, Line 15 to page 12, Line 4) is supposed to focus on impacts on natural and human systems, not on solutions. We suggest that the sentence to be modified to: “Natural coastal ecosystems may contribute to reducing negative impacts on sea level rise and intensified storms by protecting coastal regions.” [Japan]	Accepted - starting sentence has been reworded
35602	11	47	11	48	Text in bold needs better wording [Roman Corobov, Republic of Moldova]	Accepted - Sentence was reworded
40150	11	47	12	4	There is nothing here relevant to impacts @1.5 consider deletion [Ko Barrett, United States of America]	Accepted- now more 1.5deg focused.
52564	11	47	11	48	Suggested change: "Natural coastal ecosystems may be cost effective solutions to protect coastal regions against rising sea levels and intensifying storms." [Charlotte Roehm, United States of America]	Accepted - Sentence was reworded
60320	11	47	11	48	The bolded component of this Key Finding (lines 47-48) is is not directly related to the supporting text that appears underneath it. Also, this bolded sentence needs an active verb to make the sentence work. In order for 'natural coastal ecosystems' to be 'cost-effective solutions', a verb is needed to explain what is being done to the ecosystems to make them a solution – e.g., restoring natural coastal ecosystems, or preserving natural coastal ecosystems. [United States of America]	Accepted - sentence reworded
62650	11	47	11	48	You have nowhere before mentioned EBA. Why sudenly introduce it here? You need to consider integrating EBA in your ES in much more general terms. [Andreas Fischlin, Switzerland]	Noted - relevant sections added to point.
62652	11	47	12	4	Consider mergin this bullet with the previous one [Andreas Fischlin, Switzerland]	Rejected - these are two separate issues. The bullet points have also be reworded in light of other comments.
21744	12	1			React instead of "respond positively" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
32172	12	1	12	2	Clarify vertical accretion. Very unclear how coasts can 'respond positively'. [Jamaica]	Accepted - sentence reworded
36448	12	1	12	1	Clarify the term vertical accretion in the context of what is being refered to. Very unclear how coasts can 'respond positively'. [Snaliah Mahal, Saint Lucia]	Accepted - sentence reworded
15868	12	2	12	4	This sentence does not make sense. [Australia]	Not applicable - This section was rewritten
32174	12	2	12	4	Statement is unclear. Does not have corresponding section in the paper. [Jamaica]	Taken into account - Small islands now have their own ES point with section numbers.
36460	12	2	12	4	Statement is unclear. Does not have corresponding section in the paper. [Snaliah Mahal, Saint Lucia]	Taken into account - Small islands now have their own ES point with section numbers.
255	12	3	12	3	....knowledge gaps in understanding future..... [Paul Doyle, Canada]	Noted - Point now reworded, so comment redundant
1242	12	3	12	3	and understanding future impacts should be "and in the understanding of future impacts" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
35604	12	3			How to combine the simultaneous availability of “considerable knowledge gaps and understanding”? [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
39580	12	3	12	3	Consider to replace "there are considerable knowledge gaps and understanding future impacts and..." by "there are considerable knowledge gaps in understanding future impacts and..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
52566	12	3	12	3	Change 'and' to 'in'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
56270	12	3	12	3	Change "and" to "in". [Annika Herbert, Australia]	Not applicable - This section was rewritten
60322	12	3	12	3	knowledge gaps and understanding unclear. "knowledge gaps in understanding"? [United States of America]	Not applicable - This section was rewritten
6466	12	4	12	4	wider development needs.' should be 'wider development needs is essential.' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9736	12	4	12	4	Please add section reference. [Alexander Nauels, Australia]	Taken into account - Small islands now have their own ES point with section numbers.
9562	12	6	13	26	While the points of the Executive Summary under the 'Key economic sectors, human health, food production, safety and conflict in a 1.5 world' apply to Indigenous populations, there should be a point under this heading that specifically notes the impacts on Indigenous peoples who are already feeling impacts mentioned, as well as impats on culture and identity, and who continue to experience and adapt to these impacts. [Joanna Petrasek MacDonald, Canada]	There was insufficient literature on the impacts of warming of 1.5 and 2C on Indigenous peoples to be included in the Executive Summary.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9568	12	6	13	26	While the human rights angle was mentioned in Chapter 1 and noted as important to the framing of the report, in this chapter the term 'human rights' is not mentioned and equality is only discussed briefly under the discussion of livelihoods and poverty. This creates a disconnect between the framing chapter and this chapter on impacts. More content is needed to frame the various sections throughout this chapter from a human rights angle. For example, in discussing projections of sea ice, the importance of ice to Inuit hunters for subsistence, wellbeing, culture, and travel could be emphasized to make the point that declining sea ice and increasingly dangerous conditions are infringing on the human rights of Inuit to practice their culture and survive off the land as their ancestors have done for thousands of years. [Joanna Petrasek MacDonald, Canada]	Chapter 3 focuses on the impacts of warming of 1.5 and 2C. There wasn't literature on the extent to which warming of these levels above preindustrial could affect human rights.
62656	12	6	12	6	This heading makes no sense only here, since you have discussed provisioning services, e.g. fisheries, before. Reorganize the bullets accordingly or then separate provisioning services from ecosystems, agroecosystems, and forest ecosystems accordingly. i.e. discussing henceforth only human systems including human health [Andreas Fischlin, Switzerland]	Accepted. The Information has been reorganized.
10008	12	7	12	42	Most of the claims are deductive and qualitative, need further quantification on the impact of the 1.5oC versus 2.0oC [Saudi Arabia]	Text was revised and reflects the findings included in the chapter, based on available literature.
22770	12	7		13	Focusing on urban area is importnt. Show related points of description. [Shuzo Nishioka, Japan]	Accepted. The statement has been revised.
40152	12	7	12	20	Is there literature to assess on this or are the authors making assumptions based on linear associations of temperature or a general sense of tourism? If there is no literature, consider deletion. Confidence level? [Ko Barrett, United States of America]	Text was revised and reflects the findings included in the chapter, based on available literature. Confidence statements have been added.
52568	12	7	12	7	Add 'a' prior to both 'warming'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
54406	12	7	13	26	The focus on SIDS is very important, but some more regional detail, part. for Africa and Asia would be good to have [Reinhard Mechler, Austria]	Africa and Asia are included in a number of ES statements (see pg 7, 10,11. Regional information on Africa and Asia is also included in a number of sections in the Chapter including Box 3.1 and Section 3.5.4.
56604	12	7	12	13	Does this imply impacts are linear? Is there any evidence that they are? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. The statement has been revised.
62658	12	7	12	9	What means "greater risks"? Significantly greater or not? In the cases to which the "in most" does not apply, is there the risk the same or only insignificantly greater at 2 vs. 1.5? While I like the fact that this statement is more differentiated, we have theproblem that shis statement is also inconsistent with sweeping statements contained in bullets such as on page 10, line 17..23. Please consider such discrepancies very carefully. [Andreas Fischlin, Switzerland]	Accepted. The statement has been revised.
41502	12	8	12	8	delete: by vulnerability [Sergio Aquino, Canada]	Not applicable - This section was rewritten
4976	12	9	12	11	The presumption that the relationship is linear is almost assuredly WRONG. If indeed the distribution of occurrence of various outcomes about its mean is a bell-shaped curve, which is typical (and consistent with the Hansen et al. PNAS article of a few years ago), then the increase in occurrence of passing a threshold like a two-sigma level is much more than linear. With the temperature rise ofonly several tenths of a degree from the mid-20th century, the likelihood of 1 in 1000 events in the 1951-80 period is now 1 in 10--so this is far, far more than linear. I just do not understand the basis for even thinking that the relationship might be linear--the frequency of what have in the past been thought to be extremes is increasing far more than that. [Michael MacCracken, United States of America]	Accepted. The statement has been revised.
13006	12	9	12	9	Linear associations is it a finding ? Please explain [Eric Martin, France]	Accepted. The statement has been revised.
21700	12	9	12	9	Are all the associations really "linear"? [Sweden]	Accepted. The statement has been revised.
256	12	10	12	10	.....mean that an additional..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
52570	12	10	12	10	Add 'an' prior to 'additional'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
52572	12	11	12	13	Suggested change: "The scale and distribution of future impacts in cities depend on the scope and effectiveness of additional adaptation strategies geared towards vulnerable assets and people, and on mitigation for risks from further warming." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
257	12	12	12	12	.....cities of their vulnerable..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
1244	12	12	12	12	sentence meaning unclear [Butt Nathalie, Australia]	Not applicable - This section was rewritten
10386	12	12	12	12	the last bit of the sentence is true for basically all impacts. Mitigation risk from further warming will always be an issue? Seems trivial as written here. [Christopher Reyer, Germany]	Accepted. The statement has been revised.
35606	12	12			…their vulnerable assets [Roman Corobov, Republic of Moldova]	Not applicable - This sentence was rewritten
35608	12	12			…of risks [Roman Corobov, Republic of Moldova]	Not applicable - This sentence was rewritten
6052	12	15	12	20	I'm not sure how this statement relates to 1.5 or 2 deg C warming [Timothy Carter, Finland]	Accepted. Text was revised accordingly
15870	12	15	12	20	Also consider impacts and risks for nature-based tourism such as on coral reefs, where indirect socio-economic effects may occur through climate change degradation of such tourism sites. [Australia]	Accepted. Text was revised and reflects information on coral reefs and tourism, included in the chapter.
35610	12	15	12	20	This general statement should be somehow adapted to a 1.5°C warming [Roman Corobov, Republic of Moldova]	Accepted. Text was revised accordingly
50650	12	15	12	20	Impacts on Tourism (wildlife tourism) in many regions could also result from changes in biodiversity or proliferation of invasive species [Jagdish KRISHNASWAMY, India]	Text was revised and reflects the findings included in the chapter, based on available literature.
62662	12	15	12	20	Statements like this one are not 1.5 specific and are best deleted. Please do not write a mini AR6! [Andreas Fischlin, Switzerland]	Accepted. Text was revised accordingly
258	12	16	12	16	.....will negatively directly impact [Paul Doyle, Canada]	Not applicable - This section was rewritten
50774	12	16	12	17	..climate dependent toueism.. instead of "..climate dependant tourism.." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
7234	12	18	12	19	Sentence starting with "The translation …" is unclear. Is is that there is limited scientific evidence to assess the "translation", or is it that the translation it self is limited (which I don't exactly understand). What does "geographically limited" means when applied to a "translation" ? Are effects/impacts weaks ? Other meaning ? This sentence would certainly benefit from a rephrasing/clarification. [Samuel MORIN, France]	Accepted. Text was revised.
259	12	22	12	22	.....warming target is not exceeded. [Paul Doyle, Canada]	Not applicable - This section was rewritten
4978	12	22	12	25	While true as written, there is no context provided indicating how damaging a warming of 1.5 C would be, much less an overshoot and then return to 1.5 C warming. There is also no mention of the limits put on shifting of ranges of fisheries by ocean acidifcation, much less by the geography of the oceans, etc., nor by the other stresses that face fisheries. And, again, no confidence level is provided. [Michael MacCracken, United States of America]	Accepted: text changed and the executive summary for chapter 3 reorganised and restructured to accommodate these and other tissues.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
15872	12	22	12	22	We are not sure the following statement is correct, it seems very bold and broad - "Substantial benefits exist for marine fisheries if the 1.5oC global warming target is achieved". Is there a component 'compared to a 2°C global warming scenario' missing? [Australia]	Accepted: text has been removed from the executive summary and the discussion of this specific example of increased productivity fisheries as a result of warming of high latitude fisheries explored within the text of the chapter only. The general comment, that ecosystem services are more abundant at 1.5°C as opposed to 2°C still holds as a general statement (with obvious interesting temporary examples such as the fisheries example here).
17272	12	22	12	25	This whole paragraph needs careful editing. [David Schoeman, Australia]	Accepted - Text was revised
21702	12	22	12	22	Should make it clear that the benefits are about avoided impacts (compared to 2 deg), not absolute benefits. [Sweden]	Accepted: text has been changed.
21746	12	22			Substantial benefits exist for marine fisheries if the 1.5ºC global warming target is achieved, does it means that global warming is good for fisheries? or just that 1.5ª is less damaging than 2ºC? Please consider a new formulation for this sentence. [LUIS VALDES, Spain]	Accepted: text has been removed from the executive summary and the discussion of this specific example of increased productivity fisheries as a result of warming of high latitude fisheries explored within the text of the chapter only. The general comment, that ecosystem services are more abundant at 1.5°C as opposed to 2°C still holds as a general statement (with obvious interesting temporary examples such as the fisheries example here).
32460	12	22	12	22	See comment 2. Consider changing "benefits" to "reduction in risk" [Rosanne Martyr-Koller, Germany]	We respectfully disagree. The benefits are in many cases (Ecosystem services) are more than just simply an adjusted risk level.
34774	12	22	12	22	The sentence in the Executive Summary states 'Substantial benefits exist for marine fisheries if the 1.5°C global warming target is achieved'. However, this sentence does not provide an example of how or why this is the case. The sentence would be better if edited to explain 'Substantial benefits exist for marine fisheries if the 1.5°C global warming target is achieved as marine fisheries are to be affected by the loss of coral reef dependent species at higher levels of warming'. [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: text has been removed from the executive summary and the discussion of this specific example of increased productivity fisheries as a result of warming of high latitude fisheries explored within the text of the chapter only. The general comment, that ecosystem services are more abundant at 1.5°C as opposed to 2°C still holds as a general statement (with obvious interesting temporary examples such as the fisheries example here).
41504	12	22	12	22	Dependant coastal communities in the hundreds of millions of people face reduced income, ealth, coastal protection from erosion. [Sergio Aquino, Canada]	Not applicable - This section was rewritten
49840	12	22	12	22	The headline here is a bit strange "substantial benefits … if the … target is acheived". True, but benefits would be even larger if we would stay at 1.2 or 1C. Wouldn't it be better to phrase it as "substantial adverse impacts may be avoided …"? [Erik Kjellström, Sweden]	Accepted: word target removed and text changed.
57612	12	22	12	25	Repetition of bullet page 11 line 21, suggest merge [Hans Poertner, Germany]	Accepted: text has been changed.
60324	12	22	12	25	This key finding is largely repetitive of the finding appearing on page 11, lines 21-27. The two should be combined or more sufficiently differentiated. [United States of America]	Accepted: text has been changed.
62664	12	22	12	22	Close to being policy prescriptive. Then, ther is no such thing as the 1.5 target, there is only a 1.5 limit (Who wants to stay forever at 1.5°C warming?!). [Andreas Fischlin, Switzerland]	Accepted: word target removed and text changed.
62668	12	22	12	25	Bold text is in its essence redundant to bullet page 11, lines 21..27. Rephrase and emphasize what this means for human systems, communities that depend on those fisheries. (2 vs. 1.5) [Andreas Fischlin, Switzerland]	Accepted: text changed and the executive summary for chapter 3 reorganised and restructured to accommodate these and other tissues.
35612	12	23			...is the hundreds [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
15874	12	24	12	24	livelihoods [Australia]	Not applicable - This section was rewritten
3408	12	27	12	36	Merge both paragraph as they both relate to human health. [David Docquier, Belgium]	Accepted - Paragraphs were merged
4980	12	27	12	30	There is no mention here of the health threats of more extreme storms and tropical cyclones, floods from more intense precipitation, wildfires, etc. And in terms of just pure heating, there is no mention that the absolute humidity will be, in most cases, rising, and this means the discomfort index will be rising more than the temperature. [Michael MacCracken, United States of America]	Text was revised and reflects the findings included in the chapter, based on available literature.
31466	12	27	12	28	How large are "greater risks" ? More specific explanation is necessary. [Japan]	Rejected. Greater risks at 2ºC than at 1.5ºC
31468	12	27	12	30	The descriptions for 'the cold-related mortality' is necessary as indicated in P122 L42-43. [Japan]	Not applicable - text was revised
36952	12	27	12	28	How large are "greater risks" ? More specific explanation is necessary. [Keigo Akimoto, Japan]	Rejected. Greater risks at 2ºC than at 1.5ºC
52574	12	27	12	27	Add an 'a' prior to both 'warming'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
62670	12	27	12	30	How much greater? Rephrase using IPCC ucnertainty language.(2 vs. 1.5) [Andreas Fischlin, Switzerland]	Global quantification was not possible based on the literature. Sentence edited using IPCC uncertainty language.
10388	12	28	12	28	to be more convincing name some of the exceptions [Christopher Reyer, Germany]	Rejected - due to limited space
35616	12	28	12	29	To shorten: …will very likely increase heat- and ozone-related mortalities [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
46656	12	28	12	34	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text was revised accordingly
5572	12	29	12	29	I guess the right word is …remain [Sandra CASSOTTA, Denmark]	Not applicable - text was revised
6468	12	29	12	29	reamin' should be 'remain' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
12806	12	29			In the sentence, "… if precursor emissions reamin the same…" reamin should be spelled remain [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
31028	12	29	12	29	remain [Rafiq Hamdi, Belgium]	Not applicable - This section was rewritten
35614	12	29			remain' instead of 'reamin' [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
39582	12	29	12	29	Typo, replace "reamin" by "remain". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
50776	12	29	12	29	..emissions remain the same.. instead of "..emissions reamin the same.." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
60326	12	29	12	29	Typo "reamin" [United States of America]	Not applicable - This section was rewritten
52576	12	30	12	30	Add 'will' before 'likely'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
6054	12	32	12	32	Here there is no information about 1.5 vs 2.0 deg C warming [Timothy Carter, Finland]	Accepted. Text was revised
31050	12	32	12	36	It needs to be noted that infectious disease will also be affected by development trends. For the majoirty of diseases, climate is not the main driver, with access to healthcare, poverty, socioeconomc status, and education more important. This needs noting here. [James FORD, Canada]	This is detailed in chapter 3 with the specific sections noted.
35618	12	32	12	36	In what degree this general well-known statement relates to a 1.5°C world? [Roman Corobov, Republic of Moldova]	Accepted. Text was revised
38662	12	32	12	36	I am not sure if this more general material (although still important) fits into the ES of a chapter focusing on impacts of 1.5. Too general I think [Jan Fuglestvedt, Norway]	Accepted. Text was revised

Comment No	From Page	From Line	To Page	To Line	Comment	Response
41506	12	32	12	33	Projected increases or decreases depend on the disease…. [Sergio Aquino, Canada]	Not applicable - This section was rewritten
62676	12	32	12	36	Best to delete, since no SR1.5 specific bullet. Do not write a mini AR6! [Andreas Fischlin, Switzerland]	Accepted. Text was revised
56606	12	33			are these examples for an increase or a decrease or both? If the latter what is what? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text was revised
10390	12	35	12	36	the last bit of the sentence is true for basically all impacts. Mitigation risk from further warming will always be an issue? Seems trivial as written here. [Christopher Reyer, Germany]	Accepted. Text was revised
52578	12	35	12	36	Clarify what is meant by 'risks past mid-century'. Suggested change: "…and on mitigation for predicted risks beyond 2050." [Charlotte Roehm, United States of America]	Accepted. Text was revised
260	12	38	12	40	...poverty and disadvantage in many populations globally. By the mid- to late 21st century.....poor people poorer and the association..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
4982	12	38	12	42	With respect to the main finding, this phrasing implies that there are not problems for the poor and disadvantaged at warmings below 1.5 C, and this is simply not the case--there are already problems at 1 C and were problems relating to the climate at lower temperatures. A couple of points above, it was asserted that relationships are linear--well, that is not how this point is phrased, seeming to have a threshhold of 1.5. And I do not understand the final sentence--it sounds as if that climate is forcing people to leave agricultural-dependent communities is a good thing, and I am not aware of the basis for this being good. [Michael MacCracken, United States of America]	This sentence has been revised. A broader discussion on Poverty is provided in the section 5.2.2
6056	12	38	12	39	What about temperature changes up to 1.5 deg C? [Timothy Carter, Finland]	This sentence has been deleted. Only those that focusses on 1.5/2 remain.
7196	12	38	12	39	But we are seeing these trends already now! Why 'beyond 1.5C'? [Petra Tschakert, Australia]	This sentence has been deleted. Only those that focusses on 1.5/2 remain.
17274	12	38	12	42	This whole paragraph needs careful editing. [David Schoeman, Australia]	Accepted - Section was revised
35870	12	38	12	42	This section needs reframing and clarity in linking climate change with poverty. Mentioning that climate change is likely to increase poverty, places it as an independent factor. Climate change is an additional element to existing poverty, on its own and in conjunction with existing causes of poverty. Chapter 13 of WGII AR5, states that "climate change adds an additional burden to poor people and their livelihoods acting as a threat multiplier." Further, the chapter stresses that unless the existing inequalities reduce, neither alleviating poverty nor decreasing vulnerabilities to climate change can be achieved. References: Olsson, L., M. Opondo, P. Tschakert, A. Agrawal, S.H. Eriksen, S. Ma, L.N. Perch, and S.A. Zakieldeen, 2014: Livelihoods and poverty. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 793-832. [India]	This sentence has been revised. A broader discussion on Poverty is provided in the section 5.2.2
40154	12	38	12	42	Nothing specific to 1.5C, just general statements about the connection between povery and climate change. Consider deleting. [Ko Barrett, United States of America]	This sentence has been deleted. Only those that focusses on 1.5/2 remain.
46658	12	38	12	38	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted, confidence statements are provided in the ES.
49730	12	38	12	39	It is suggested that the sentence of 'Average global temperatures that extend beyond 1.5°C are likely to increase poverty and disadvantage in many populations globally' should be changed as 'Even just 1°C of global warming, the poverty and disadvantages have been observed in many cases, average global temperatures that extend beyond 1.5°C are likely to greatly increase poverty and disadvantage in many populations globally'. [Yinlong XU, China]	This sentence has been revised.
62678	12	38	12	39	While I am no specialist in the field of social sciences, I have nevertheless a very hard time to trust this statement based on my long experience in the field of CC impact where thresholds can rarely be found and severity of impacts mostly increases with warming only gradually. Why should 1.5°C be such a clear threshold of warming beyond which poverty and disadvantage increase? What about the present? Would that statement not also be true for a warming of 1°C or 2°C? If it should be true for any warming limit, then this should be stated in this manner. Mentioning with such a meaning only one limit, e.g. 1.5°C, would be doing a disservice to IPCC. Poverty and otherwiser disadvantaged people are so important, please carefully reconsider the meaning and rephrase this bullet. [Andreas Fischlin, Switzerland]	This sentence has been revised. A broader discussion on Poverty is provided in the section 5.2.2
1246	12	39	12	39	remove "in" at beginning of line [Butt Nathalie, Australia]	Not applicable - This section was rewritten
52580	12	39	12	39	Remove 'in'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
35300	12	40	12	40	Suggestion: multiplier in bold [Ana Bastos, France]	Not applicable - This section was rewritten
35302	12	41	13	8	medium confidence and "high confidence" in italics [Ana Bastos, France]	Not applicable - This section was rewritten
39584	12	41	12	41	Use italic for "high confidence". [Hernan Edgardo Sala, Argentina]	Accepted - Text was italicized
46872	12	41	12	42	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - Text was italicized and Text was revised with the suggested edit
39586	12	42	12	42	Use italic for "medium confidence". [Hernan Edgardo Sala, Argentina]	Accepted - Text was italicized
52582	12	42	12	42	agriculturally-dependent [Charlotte Roehm, United States of America]	Rejected - text is correct
261	12	44	12	44	Holding global warming to 1.50 C will be crucial to small island..... [Paul Doyle, Canada]	unclear what this comment refers to
3686	12	44	13	3	The conclusion in this paragraph emphasizing SIDS is not necessary here since it is also true for all other regions in the world. [Ying Chen, China]	Text has been modified and the concluding statement has been changed
4984	12	44	12	46	WHAT? Of course the small island states can't keep the rise in global average temperature below 1.5 C because they are not the ones putting virtually all of the emissions out and cannot be expected to extract the emitted CO2 out and sequester it. What is presumably meant here might be conveyed by saying: "Dealing with the impacts of an increase of global temperature of 1.5 C will prove even more challenging ...."--and very nice that the second half of the point refers to damage at the existing temperature increase. [Michael MacCracken, United States of America]	Language has been changed to reflect that small islands are not solely responsible for mitigation. The new text reflects that SIDS face challenges at 1.5C and higher temperatures.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
18248	12	44	13	3	impacts from climate change will affect, ceteris paribus, equally all Low Lying Islands, Coasts and Communities. Please analyse the implications for these geographical areas (as opposed to political grouping SIDS). [Andrea TILCHE, Belgium]	Text has been changed from SIDS to small islands
31470	12	44	12	46	Regarding "Average global temperatures that extend beyond 1.5°C are likely to increase poverty and disadvantage in many populations globally.", assumptions for economic impacts due to climate mitigation should be stated. Therefore, please add the sentence "On the other hand, climate change mitigation to below 1.5°C levies great economic burden on the society, and may also increase poverty and disadvantage in many populations globally". [Japan]	This comment is not applicable to the text that it refers to. Perhaps the commenter input incorrect page and line numbers.
32076	12	44	12	45	The phrase 'Keeping global temperature to 1.5?C will still prove challenging for small island developing states' needs to be rephrased as it currently implies that SIDS are responsible for keeping global temperatures below 1.5?C. Suggestion to change this phrase to: "Even if global temperatures are kept below 1.5?C, there will be be considerable challenges for SIDS..." [Jamaica]	Language has been changed and "keeping" is no longer in the updated text. The new text reflects that SIDS face challenges at 1.5C and higher temperatures.
36408	12	44	12	45	The phrase 'Keeping global temperature to 1.5?C will still prove challenging for small island developing states' needs to be rephrased as it currently implies that SIDS are responsible for keeping global temperatures below 1.5?C. Suggestion to change this phrase to: "Even if global temperatures are kept below 1.5?C, there will be be considerable challenges for SIDS..." [Snaliah Mahal, Saint Lucia]	Language has been changed and "keeping" is no longer in the updated text. The new text reflects that SIDS face challenges at 1.5C and higher temperatures.
38406	12	44	12	45	The phrase 'Keeping global temperature to 1.5?C will still prove challenging for small island developing states' needs to be rephrased as it currently implies that SIDS are responsible for keeping global temperatures below 1.5?C. Suggestion to change this phrase to: "Even if global temperatures are kept below 1.5?C, there will be be considerable challenges for SIDS..." [Grenada]	Language has been changed and "keeping" is no longer in the updated text. The new text reflects that SIDS face challenges at 1.5C and higher temperatures.
38664	12	44	12	44	The word "keeping" make the reader think about mitigation efforts (i.e. emisisons reductions) while here we are talking about impacts and responses. Therefore I suggest deleting "keeping" and changing "to" to "at". [Jan Fuglestvedt, Norway]	Accepted - Text was revised with the suggested edit
49096	12	44	12	45	Keeping global temperature to 1.5?C will still prove challenging for small island developing states needs to be rephrased as currently implies SIDS are responsible for keeping global temperatures below 1.5?C. Suggest "Even if global temperatures are kept below 1.5?C there will be be considerable challenges for SIDS..." [Bill Hare, Germany]	Language has been changed and "keeping" is no longer in the updated text. The new text reflects the same meaning as the proposed text in this comment
50778	12	44	12	44	...Small Iland Developing States (SIDS)... instead of "...small iland developing states (SIDS)..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
52584	12	44	12	46	Suggested change: "Maintaining global temperature increases to 1.5oC will still prove challenging for small island developing states (SIDS) that are already facing significant threats from climate change and other stressors at 1oC of warming." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
53904	12	44	12	45	This reads as if small islands are mitigating on their own [Piers Forster, United Kingdom (of Great Britain and Northern Ireland)]	Language has been changed to reflect that small islands are not solely responsible for mitigation. The new text reflects that SIDS face challenges at 1.5C and higher temperatures.
54396	12	44	12	44	Wording: "keeping global temperature … wil prove challenging for .. SIDS", it is not the SIDS that can do that, maybe: " even if temperatures…" [Reinhard Mechler, Austria]	Not applicable - This section was rewritten
54398	12	44	13	3	What are the hazards? Is lkely a calibrated IPCC uncertainty language statement or common parlance? Can you add confidence? [Reinhard Mechler, Austria]	Due to space constraints, the multiple hazards facing small islands cannot be listed in the ES statement. However, the hazards are discussed in the supporting sections that are listed at the end of the ES statement. Confidence statements have been added
54400	12	44	13	3	Unclear: "Adaptation to be considered in light of SD" [Reinhard Mechler, Austria]	Text has been modified and this statement is no longer included
57614	12	44	12	48	Not only SIDs, applies to many vulnerable regions and populations [Hans Poertner, Germany]	This ES statement specifically focuses on small islands and is in the "Small islands, and coastal and low-lying areas" section of the ES
62680	12	44	13	3	Why should this be only true for SIDS? With all respect for SIDS, but this bullet needs to be carefully rephrased to capture similar impacts for other disadvantaged people and communities. (2 vs. 1.5) [Andreas Fischlin, Switzerland]	This ES statement specifically focuses on small islands and is in the "Small islands, and coastal and low-lying areas" section of the ES.
49842	12	45	12	45	Here it is talked about stressors at 1C. Earlier in the summary it is stated that 1C = 2017 and "present day warming of 1C". So, are the stressors talked about present already today? Then state it! [Erik Kjellström, Sweden]	The text has been modified and reference to 1C has been removed.
4986	12	46	13	3	There is no mention here of the likely consequences of sea level rise for the island states. If sea level sensitiviity for the global ocean is indeed 15-20 meters/degree as paleoclimatic changes imply, then many of the small island nations are already in serious, long term jeopardy of being wiped off the map, and stabilizing at 1.5 or 2, overshoot or not, is already far too high a stabilization level. What their leaders really should have been asking for is that the ultimate equilibrium level be 0 C (or even less for a while) if they want to avoid inundation and survive, and all with no overshoot. I just do not see how they could have thought that saying stay below 1.5 C would also mean that 1.5 C is anywhere close to an acceptable long-term equilibrium increase in the global average temperature. [Michael MacCracken, United States of America]	Text has been modified and there is now inclusion of risks from sea level rise. There is also another ES statement that specifically addresses risks of sea level rise for small islands
262	12	47	12	47	.....loss of or negative change..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
41322	12	47	13	2	If the word "likely" is not calibrated language, it is suggestedthat it shoukd not be used. [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
46660	12	47	12	47	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Uncertainty language has been properly formatted
10010	13	1	13	2	Statement on benefits to small island developing states (SIDS) is too general and without much information on the potential adoption measures in regards to sustainability. [Saudi Arabia]	Text has been modified and this term is no longer included. The ES statement now focuses on changes to risk at 1.5C compared to 2C for small islands
52586	13	1	13	3	Discussing 'benefits' and 'advantages' of a 1.5oC relative to 2.0oC warming does not seem to be the right tone, since a 1.5oC increase in global temperatures will, in itself, result in serious socio-environmental impacts. I would like to suggest changing the overall tone to reflect this without sounding overly pessimistic. For example: "Risks faced by SIDS in a 1.5oC world compared with a 2.0oC world will be lower, especially when coupled with the implementation of alternative adaptation strategies." [Charlotte Roehm, United States of America]	Text has been modified and the ES statement now focuses on changes to risk at 1.5C compared to 2C for small islands
1778	13	2	13	3	The sentence, as it is, indicates that there is a trade-off between adaptation and sustainable development. Why is it so? On the contrary, adaptation supports sustainable development as it mitifates a threat (climate change) to this development. Perhaps the sentence intends to indicate that there are limitations to adaptation, limiting the potential benefits to SIDS from avoided risks a 1 t 1.5 oC versus 2.0 oC. If so, these limitations must be mentioned in brief here. [Greece]	Text has been modified and these terms are no longer included. The ES statement now focuses on changes to risk at 1.5C compared to 2C for small islands
7198	13	2	13	3	Yes, but how? What does this mean concretely? [Petra Tschakert, Australia]	Text has been modified and these terms are no longer included. The ES statement now focuses on changes to risk at 1.5C compared to 2C for small islands

Comment No	From Page	From Line	To Page	To Line	Comment	Response
18250	13	2	13	3	The sentence seems to imply that adaptation action does not contribute/goes against sustainable development. If this is the case, please explain how. If not, please rephrase. [Andrea TILCHE, Belgium]	Text has been modified and these terms are no longer included. The ES statement now focuses on changes to risk at 1.5C compared to 2C for small islands
62682	13	4	13	5	Reduce by how much? Reduce significantly or not? Reduce relative to what, 2 vs. 1.5? Remember also that conflicts due to CC are contested. Formulate as robustly as possible. (2 vs. 1.5?) [Andreas Fischlin, Switzerland]	Accepted. A new sentence is added to say that current methodologies that try to link CC and conflict are biased, with reference from Adams et al 2018
4988	13	5	13	11	With over 90% of displacement since 2000 being related to climate and weather stresses, as noted in this point, at a time when the warming was just getting to 1 C, it needs to be said here much more forcefully that going to 1.5 or 2 C is going to be much, much more disruptive of society. I think it would also be very helpful to decisionmakers to be providing some real numbers about those displaced instead of just talking about more or fewer refugees. [Michael MacCracken, United States of America]	This sentence has been revised.
7200	13	5	13	6	This comes across as a bit simplistic. There are many factors contributing to human conflict that have very little to nothing to do with climate. [Petra Tschakert, Australia]	Accepted. A new sentence is added to say that current methodologies that try to link CC and conflict are biased, with reference from Adams et al 2018
15876	13	5	13	11	The heading of this paragraph should mention displacement (migration) as this is a focus of the paragraph. Also, the final sentence does not make sense. [Australia]	Not applicable - This text was deleted
17276	13	5	13	11	This whole paragraph needs careful editing. [David Schoeman, Australia]	Accepted - Text was revised
40156	13	5	13	11	Supporting statements say nothing about conflict at 1.5C. General discussions of the relationship between climate and conflict should be saved for the main AR6 assessment. [Ko Barrett, United States of America]	This sentence has been deleted. Only those that focusses on 1.5/2 remain.
46662	13	5	13	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted, confidence statements are provided in the ES.
49714	13	5	13	6	Keeping average global warming to 1.5°C is likely to reduce the factors that can contribute to human conflict such as extreme events and eroding food and water supplies' is suggested to change as 'Keeping average global warming to 1.5°C is likely to reduce the key risk factors that can result in the human conflict such as extreme events and eroding food and water supplies relative to average global warming to 2°C'. [Yinlong XU, China]	This sentence has been revised.
49844	13	5	13	5	I guess "below" has been left out here, before "1.5C"! [Erik Kjellström, Sweden]	Not applicable - This text was deleted
263	13	6	13	6	Disaster related human displacement..... [Paul Doyle, Canada]	Not applicable - This text was deleted
52588	13	6	13	6	Change to: "...and the erosion of food and water supplies." [Charlotte Roehm, United States of America]	Not applicable - This text was deleted
52590	13	6	13	8	Suggest changing to: "Disaster related displacement is projected to increase over the 21st century. Between 2001 and 2015, over 90% of displacements were related to climate and weather disasters (medium confidence)." [Charlotte Roehm, United States of America]	Not applicable - This text was deleted
60328	13	6	13	6	Disaster related displacement of what? What exactly being displaced? [United States of America]	This sentence has been revised.
264	13	7	13	8	.....21st century, since more than 90% of those displaced between 2001 and 2015 was related to climate change and weather..... [Paul Doyle, Canada]	Not applicable - This text was deleted
1248	13	7	13	7	remove "was" [Butt Nathalie, Australia]	Not applicable - This text was deleted
3394	13	7			Remove 'was'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6470	13	7	13	7	was related' should be 'related' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
12808	13	7			In the sentence "… with over 90% of displacement between 2001 to 2015 was related…" the "was" is superfluous. It should read "...2015 related…" [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
30442	13	7	13	7	« with over 90% of displacement between 2001 to 2015 was related to climate and weather disasters » Wording : delete "was" [France]	Not applicable - This text was deleted
35620	13	7			…2015 related' (without was) [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
41508	13	7	13	7	no comma [Sergio Aquino, Canada]	Not applicable - This text was deleted
60330	13	7	13	7	with over 90% of displacement between 2001 to 2015 was related may be rewritten for clarity, such as "where over 90%" [United States of America]	Not applicable - This text was deleted
265	13	8	13	11	Final sentance needs total revamping. [Paul Doyle, Canada]	This sentence has deleted. Only those that focusses on 1.5/2 remain.
1250	13	8	13	11	check this sentence - hard to follow/meaning unclear [Butt Nathalie, Australia]	Not applicable - This text was deleted
21704	13	8	13	10	The sentence is very unclear, please clarify. [Sweden]	Not applicable - This text was deleted
46874	13	8	13	11	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted, confidence statements are provided in the ES.
52592	13	8	13	11	Suggested change as this sentence provides confusion. "In agricultural and over vulnerable settings, there is strong evidence for indirect results of temperature increases exacerbating ongoing violence. Conflicting results remain with regards to the relationships between climatic variables and a range of forms of human conflict and violence (low confidence)." [Charlotte Roehm, United States of America]	This sentence has been revised.
57616	13	8	13	11	Reword, not very clear [Hans Poertner, Germany]	Not applicable - This text was deleted
35622	13	9			Better: 'especially' instead of 'over'… [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
6472	13	10	13	10	during the relationships' should be 'for the relationships' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
35624	13	10			in the relationships' instead of during [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
5516	13	13	13	17	I could not find the source of the agragate impact estimate (1.6%) in this chapter. I am surprised that such a clear number was arrived at when the AR5 did not find this to be clear at all. Seems unfounded. Suggest consdering this paragraph in the context of that of the AR5 WG2 SPM and Ch 10 ES statements. I am also surprised that there would be a growth threshold between 1.5 and 2. but not between 1 and 1.5. Confidence needs to be stated as well as traceability. [Haroon KHESHGI, United States of America]	Not applicable. Text was revised.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
4990	13	13	13	14	I really question this point--that what is happening at 1.5 C will be "very similar" to current impacts that are reflective of 1 C. If this is the case, then a reasonable inference would be that the impacts at 1 C are similar to those at 0.5 C, and then those at 0.5 C are very similar to those at 0 C. And so, bu associatiive reasoning, there are really no more impacts now or will be at 1.5 C than there were at 0 C--and this is demonstrably not the case (might I cite the Arctic, the loss going on from the Greenland and Antarctic ice sheets, the start of permafrost thawing, the increase in wild fires, the shifts in ranges of fish/flora/fauna, and on and on). The phrasing here is just completely unacceptable. I don't know of support for the proposition that between 1.5 and 2 C there is some single threshold related to all impacts and staying below 1.5 C is acceptable and going over 2 C is not. I think this just has to be changed. [Michael MacCracken, United States of America]	Accepted. Text was revised
9712	13	13	13	19	It is unclear how the impacts on economic growth of 1.5c compares to 2c. Does the statement imply that 1.5c pathway has lower impacts on economic growth than the 2c pathway? In which cas one would ask how economic growth is measured and particularly how mitigation costs are reflected. [Mustafa BABIKER, Sudan]	Accepted. Text was revised
22758	13	13	13	19	This para is important to show the disadvantages of low income countries. Please refer the reference point in the chapter. [Shuzo Nishioka, Japan]	Accepted. Text was revised
28196	13	13	13	19	Line 13-14 say there is not much difference between 1°C and 1.5°C in economic growth. Line 16-18 say there is an increase across 1°C > seems to be a contradiction, please explain better. [Germany]	Accepted. Text was revised
41324	13	13	13	17	no confidence levels? [Lourdes Tibig, Philippines]	Accepted. Text was revised
49098	13	13	13	19	It is difficult to reconcile the fact that the mentioned impacts of climate changes on global GDP increase by 1.6%/°C of global warming with the projected impacts at 1.5°C being equal to the current ones [Bill Hare, Germany]	Not applicable. Text was revised.
49846	13	13	13	13	What is "economic growth of 1.5C"? [Erik Kjellström, Sweden]	Accepted - Text was revised
54402	13	13	13	19	What is the level of confidence here for these statements? [Reinhard Mechler, Austria]	Accepted. Text was revised
60332	13	13	13	19	Is there a confidence or likelihood level for the statement? [United States of America]	Accepted. Text was revised
61952	13	13	13	19	I could not find the source of the executive summary statement on economic growth for 2°C in the chapter. [Valérie Masson-Delmotte, France]	Accepted. Text was revised
62684	13	13	13	16	Under 2°C includes the present (~1*C) and 1.5°C. The meaning of the 2nd sentence is therefore not easy to understand. Do you mean a bit below 2°C but >> 1.5*C? Note the subtleties with formulations such as "well below 2°C" as used in the Paris Agreement's article 2."Well below 2°C" is by some Parties also understood as 1.5°C. Thus you need to be more precise. [Andreas Fischlin, Switzerland]	Accepted. Text was revised
54180	13	14			I suggest changing "current impacts under about 1°C of global warming" to "detected at current level of warming". [Jan Fuglestvedt, Norway]	Text has been modified and there is no longer reference to 1C of global warming
62686	13	15	13	17	1.6% across 1°C is probably well meant, but not well formulated. Do you mean "further warming by 1°C" or what? Since impacts from a warming of 1°C typically vary also with the absolute level of temperature such a precise figure may not always be independent from the absolute temperature levels. [Andreas Fischlin, Switzerland]	Not applicable. Text was revised.
266	13	16	13	20	Last 2 sentences in this paragraph need to be rewritten for clarity of meaning. [Paul Doyle, Canada]	Accepted. Text was revised
10392	13	16	13	16	instead of "agriculture" write crop yield changes or so [Christopher Reyer, Germany]	Not applicable - This section was rewritten
21706	13	16	13	17	What does "impact of agriculture", "impact of energy" etc. refer to? [Sweden]	Not applicable - This section was rewritten
28198	13	16	13	17	Please rephrase paragraph because " impact of agriculture, coastal storms, energy, human mortality, labour and crime on gross domestic product " are a mixture of direct and indirect impacts of CC. Please clarify what indirect effects are meant (i.e. impacts of agriculture or energy or labour on GDP can be very different). [Germany]	Accepted - Text was revised
31472	13	16	13	17	We request clarification of what "1.6%" indicates. It could be understood as % of GDP of damage costs as this section mention economic growth and mitigation as well as adaptation cost. However, it is not clear with the current text. We request more supplement explanation for this section. [Japan]	Not applicable. Text was revised.
35626	13	16			…the impact of change in agriculture [Roman Corobov, Republic of Moldova]	Not applicable - This section was rewritten
38666	13	16	13	17	THis sentence is unclear ("1.6% across 1 deg C of global warming".) [Jan Fuglestvedt, Norway]	Not applicable. Text was revised.
49100	13	16	13	17	Should this sentence say the "impacts of climate change on agriculture, coastal storms... etc."? What level of confidence is attributed to the valuu 1.6%? Is there a range? [Bill Hare, Germany]	Not applicable. Text was revised.
60334	13	16	13	17	The following sentence is ambiguous as to whether climate change is causing a positive or negative effect on global GDP: "Globally, the impact of agriculture, coastal storms, energy, human mortality, labor, and crime on gross domestic product is estimated to increase by about 1.6% across 1°C of global warming." Also, the 1.6% value is not addressed anywhere else in the chapter. Based on the sectors listed, presumably this figure is drawn from the Hsiang et al. (2017) paper, thus: (1) shouldn't the 1.6% value be described somewhere in the chapter itself, and (2) is it appropriate to rely on a single study value in an assessment such as this? [United States of America]	Not applicable. Text was revised.
41510	13	17	13	17	across 1 or 1.5? [Sergio Aquino, Canada]	Not applicable - This section was rewritten
49848	13	17	13	17	What is meant by "1.6% across 1C"? Is it "1.6% per degree warming"? [Erik Kjellström, Sweden]	Not applicable. Text was revised.
52594	13	17	13	17	Change 'across' to 'with'. [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
3396	13	18	13	19	Rephrase the whole sentence: 'Increasing mitigation costs is projected to be offset by the reduction of climate-related costs through mitigation in certain sectors'. This would make this statement more positive. [David Docquier, Belgium]	Not applicable. Text was revised.
4992	13	18	13	19	The phrasing here is quite confusing--and the point just does not seem valid--IT NEEDS TO BE DELETED. There are all sorts of cost effective efficiency improvements that have pay back periods of a few years or less and the costs of alternatives are coming way down. With any reasonable calculation of the Social Cost of Carbon, makng sure to be considering impacts like the initiation of Greenland and Antarctic mass loss and more, there are all sorts of mitigation actions that are cost effective. I am aware of no justification for this statement unless one uses a discount rate that is far above what is appropriate to be using in situations looking at very fundamental, even irreplaceable, aspects of the environment and provision of ecological resources. [Michael MacCracken, United States of America]	Accepted. Text was revised
35628	13	18	13	19	Propose rewording: 'However, reducing climate-driven losses through limiting the degree of global warming in certain key sectors is projected to be brought to nothing by the impacts of increasing mitigation costs. [Roman Corobov, Republic of Moldova]	Accepted. Text was revised
38668	13	18	13	19	This statement needs a clear references to some robust underlying assessmente in the chapter. [Jan Fuglestvedt, Norway]	Accepted. Text was revised

Comment No	From Page	From Line	To Page	To Line	Comment	Response
52596	13	18	13	19	Suggested change: "However, the reduction in climate costs related to limiting the degree of global warming, is in certain key sectors projected to be offset by the impacts of increasing mitigation costs." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
62688	13	18	13	19	Very useful statement in principle, but close to being trivial. Full offset? Perhaps even worse? This is a very policy relevant question that is nowhere else in this ES dealt with, while it is of major concern to policy makers. You need to much more elaborate on this. In particular in the context of SR1.5. Impoacts of ambitious mitigation requiring BECCS, e.g.impacts on food prodcution, biodiversity? Very critical issues that need to be treated with much more care than this statement accomplishes. [Andreas Fischlin, Switzerland]	Accepted. Text was revised
5574	13	19	13	19	why not also mention the increase rate of emigration as a consequences of climate change? [Sandra CASSOTTA, Denmark]	Migration is mentioned in final version of the executive summary
1348	13	21	13	26	Unclear what this is being compared to. It is also a statement that does not actually belong there [Karen Olsen, Denmark]	The text has been deleted and the food production statements rewritten
3688	13	21	13	26	It is stated that mitigation costs may imply an increased risk ofhunger in low-income countries. Measures for 1.5? will further increase this risk. Food trade may thus be a key response measure to alleviate hunger in developing countries under 1.5 and 2°C stabilization scenarios. I don't agree this statement. Low income developing countries have very limited capabilities to manage the risks of hunger and may not afford to import food. Please revise accordingly. [Ying Chen, China]	The text has been deleted and the food production statements rewritten
6058	13	21	13	26	Does this statement imply the use of land for energy crops and sequestration instead of food production? Or is this more an economic analysis of trade-offs between mitigation costs and avoided damages? [Timothy Carter, Finland]	The text has been deleted and the food production statements rewritten
6164	13	21	13	26	Unclear what this is being compared to. It is also a statement that does not actually belong there [Anne Olhoff, Denmark]	The text has been deleted and the food production statements rewritten
13932	13	21	13	22	In mitigating costs associated with climate change impacts on many nations, food production is a key factor for consideration. mitigate has many definitions, I'm not sure which one you are using here. please do not use it here as anything except for mitigaiton of climate change. Plesae use remediation or some other synonym. in this sentence, you might mean in justifying the high mitigation costs? [Natalie MAHOWALD, United States of America]	The text has been deleted
18252	13	21	13	26	Unclear what this is being compared to. It is also a statement that probbaly does not actually belong there [Andrea TILCHE, Belgium]	The text has been deleted and the food production statements rewritten
28200	13	21	13	26	Please rephrase paragraph to clarify the statement because it is unclear whether food production or food trade or both is most significant to mitigate costs and to alleviate hunger. "Food trade may thus be a key response measure to alleviate hunger in developing countries under 1.5 and 2°C stabilization scenarios." Why are concrete proposals given here, whereas the rest of the statements do not provide any proposals for adaptation / mitigation measures? [Germany]	The text has been deleted and the food production statements rewritten
31474	13	21	13	26	It's a very important suggestion. We recommend to leave this suggestion for the final draft. [Japan]	The text has been deleted and the food production statements rewritten
35872	13	21	13	26	Importance of adaptation of domestic agriculture in addressing the question of food security is absent. Instead of calling for strengthening domestic agricultural production and in particular improving the resilience of crops to the effects of climate change, food trade is proposed as a key response to alleviate hunger in developing countries. It has been strongly argued in the literature that dependency on food imports has had a strong negative impact on food security of developing nations due to exposure to volatile price behaviour, thereby exacerbating poverty and hunger. Instead, the need is increased investment, including climate finance, in agriculture and in agricultural research aimed at developing climate resilient crops that ensures productivity in the face of increasing climate stresses. Para needs to be rewritten. References 1) FAO. (2011). Price Volatility and Food Security: A Report by the High Level Panel of Experts on Food Security and Nutrition. Rome: Food and Agricultural Organization of the United Nations. 2) Ghosh, J. (2010). The unnatural coupling: Food and global finance. Journal of Agrarian Change, Vol No. 10, No. 1, 72-86. 3) IATP (2008) Commodities Market Speculation: The Risk to Food Security and Agriculture, Institute for Agriculture and Trade Policy, Minneapolis, Minnesota, USA. 4) Kannan, K., Dev, S. M., & Sharma, A. N. (2000). Concerns on Food Security. Economic and Political Weekly, Vol. 35, No. 45, 4-10. 5) Naylor, R. L., & Falcon, W. P. (2000). Food Security in an Era of Economic Volatility. Population and Development Review, Vol. 36, No. 4 , 693-723. [India]	Accepted: text changed and the executive summary for chapter 3 reorganised and restructured to accommodate these and other tissues.
36954	13	21	13	26	This is a very important point. We recommend to leave this suggestion for the final draft. [Keigo Akimoto, Japan]	The text has been deleted and the food production statements rewritten
39192	13	21	13	27	This does not capture the human suffering involved in what you are saying. Please touch heart with your language, in describing the differences to people's daily lives/loss of a .5C difference. [Lindsey Cook, Germany]	Not applicable - This section was rewritten
54404	13	21	13	21	Avoid mitigating when it is supposed to refer to risk reduction [Reinhard Mechler, Austria]	Not applicable - This section was rewritten
62690	13	21	13	21	I cannot understand the meaning of "In mitigating costs associated with climate change impacts on many nations" [Andreas Fischlin, Switzerland]	The text has been deleted
62692	13	21	13	22	I cannot understand the purpose of making a statement such as "food production is a key factor for consideration". This is no useful assessment (everybody knows already who is only a bit informed). [Andreas Fischlin, Switzerland]	The text has been deleted and the food production statements rewritten
62696	13	21	13	26	The bullet is not clear (in addition to the flaws I already pointed out): With the 2°C limit we can reduce crop losses. Only with the 2°C? Not so with the 1.5°C? What about prevous bullets in this ES, which stated something else? You need to integrate this bullet with those. Then whenever you have two effects with the possibility to cancel each other out, quantitites matter a lot. Which of these effects is stronger? To which extent can they "offset" each other? This is so crucial that the vague statements made here need to be carefully reconsidered and rephrased. Use then also IPCC uncertainty language and not phrases such as "it is plausible" which have littel meaning in this highly policy relevant context. [Andreas Fischlin, Switzerland]	The text has been deleted and the food production statements rewritten
35874	13	22	13	23	That is, although restraining the global temperature increase to 2 degree C is projected to reduce crop losses under climate change may be changed to "That is, although restraining the global temperature increase to 2 degree C is projected to reduce crop losses under climate change provided there is no improvement in crop varieties and management practices" [India]	The text has been deleted and the food production statements rewritten
49102	13	22	13	25	This paragraph states that "mitigation costs may imply an increased risk of hunger in low-income countries", and that limiting to 1.5 may increase this risk further, but this statement is given with no further detail of what conditions would allow this to be the case. Mitigation options designed to not interfere with food production would not incur such a risk. Such a simplistic statement is not very helpful as it misses important context [Bill Hare, Germany]	The text has been deleted and the food production statements rewritten

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53986	13	22	13	26	The statement that mitigation COSTS would imply increase risk of hunger in low-income country is arbitrary. First, mitigation must happen first and mostly in high-income countries who must pay their historical climate debt as they caused climate change. Second, the risk of mitigation in developing countries is around the deployment of CCS/ BECCS/afforestation and other geoengineering proposals that would have large negative impacts on land use, water and biodiversity, thus competing with local food production and endangering the basis of peoples' livelihoods. Global food trade is in many cases one of the main causes of food insecurity and agriculture systems that cause climate change. DELETE all text from "That is, xxxxxx until stabilization scenarios". [Elenita Daño, Philippines]	The text has been deleted and the food production statements rewritten
1780	13	23	13	24	Why the associated mitigation costs may imply an increased risk of hunger in low-income countries? It would be better to say that the costs needed for mitigation may be too high to be undertaken by low-income countries and funding bodies (i.e. if these costs are too high and cannot be undrtaken by goverments or other funding institutions, then the relevant mitigation actions will not be implemented). The risk of hunger may be caused by mitigation measures and not by mitigation costs. [Greece]	The text has been deleted and the food production statements rewritten
4994	13	23	13	25	It is not clear here if this conclusion has allowed for how much can be accomplished b focusing mitigation efforts on strong and early reductions in emissions of short-lived warming agents--for a statement like this to be made, this point needs to be presented explicitly. In addition, to the extent that this point has validity, it needs to be said that it needs to be made clear here that the consideration is leaving out the potential for climate intervention and for what appear to be increasing possibilities for carbon dioxide removal at reasonable cost. Providing a strong near-term cooling offset is just what climate intervention could well be designed to provide if we would research the issue and start early on, basically imitating what small volcanic eruptions would be doing were they to fortuitously occur. And the costs associated with the new prospects for CDR are being claimed to be roughly equivalent to or less than the estimates of the Social Cost of Carbon. So, it is essential in the write-up here to make very clear that there are options to be considering--it is just that these options are not being fully considered as it has long been hoped the world could get along without them, just as it was hoped that mitigation could be so rapid adaptation would not be necessary. Unfortunately, this has not been the case--mitigation has been going far too slowly and so now what were inconceivable approaches in the past now need to be considered, with the note made that these options come from the bottom of the bucket and that there are not further backup options available. [Michael MacCracken, United States of America]	Text reworded - there is new section on land use and CDR. This chapter is not the appropriate place to discuss the role of short-lived warming agents.
17278	13	23	13	23	…reduce crop losses…; relative to what? [David Schoeman, Australia]	Not applicable - This section was rewritten
62694	13	24	13	24	It is plausbile? Is that all the scientific literature says? Again I say, increase this risk significanatly? By how much? Please be specific. [Andreas Fischlin, Switzerland]	Text reworded - there is new section on land use and CDR. This chapter is not the appropriate place to discuss the role of short-lived warming agents.
41512	13	25	13	25	Food trade may be a key response…. [Sergio Aquino, Canada]	Accepted - Text was revised
51042	13	25	13	26	The citation for this statement (found in the text on p. 150, line 51) is an article titled "Economic implications of climate change impacts on human health through undernourishment". The first line of the abstract says "This study quantified the impacts of climate change on human health through undernourishment using two economic measures. " It's not a study about trade. This sentence in the executive summary (and underlying report) is a sweeping statement about food trade being a key response measure to alleviate hunger. Please when you make sweeping statements like this, which can be easily and handily challenged by rigorous social science research, at least provide several appropriate sources to back up this claim. Please delete this sentence. [Doreen Stabinsky, United States of America]	Accepted. Statement is correct and a reference that supports it has been added.
52598	13	26	13	26	1.5°C and 2°C [Charlotte Roehm, United States of America]	Editorial - copyedit to be completed prior to publication
3416	14	1	16	19	Section 3.1 could be much lighter, by removing Fig. 3.1 and some paragraphs (P14 L9-11, P14 L15-21, P14 L23-25, P15 L1-12. The first paragraph of the chapter and Box 3.1 are relevant. [David Docquier, Belgium]	Agreed. The Text was revised with the suggested edits.
10522	14	1	16	20	The title of Chapter 3 is “Impacts of 1.5? global warming on natural and human systems”. But from the content list, almost all the sections involve the comparison between 1.5? and 2? warming. There is no clear reason to do this comparison as this is a special report on 1.5? warming. More elaboration is necessary to explain why this chapter also focuses on comparing the impacts between 1.5? and 2? warming. [Hong Yang, Switzerland]	In this Special Report the aim is to investigate the differences between todays climate, 1.5 °C warmer world and 2°C warmer world. It explores observed impacts and projected risks for a range of natural and human systems with a focus on how risk levels change at 1.5°C and 2°C.
48226	14	1	15	27	Compared to Chapter 2, Chapter 3 does not spell out a specific question to address which may challenging to understand the objectives of this chapter. Could questions discussed in Setion 3.2 be used in describing the objectives of this Chapter? [Sarah Connors, France]	In the SR1.5 only chapter 2 addresses specific guidance questions. Chapter 3 followed another structure.
61808	14	1	16	20	The introduction should be shortened and sharpened. The reference to Box 3.9 on page 15 reads as quite strange. I do not find the two figures of the introduction that helpful to understand where to find what. In particular, Figure 3.2 makes no use of the central part of the figure (the world map). [Valérie Masson-Delmotte, France]	The Section has been revised and the Figures changed. Figure 3.2 was deleted.
10012	14	3	14	4	The aim of this chapter is to use peer-reviewed scientific evidence published since the AR5 to assess changes in the climate, but this is not consistent with most of the used references and claims, which are in many occasion general climate science, not specific to the 1.5oC [Saudi Arabia]	Accepted. The chapter was sharpened to 1.5°C and text was revised.
39588	14	3	14	3	Insert "IPCC" before "AR5" (at least in its first mention in this chapter). [Hernan Edgardo Sala, Argentina]	Accepted. Text was revised.
40158	14	3	14	7	This chapter does exactly what is stated in the first sentence of this paragraph, but that was not the task for the Special Report. This report was to assess literature relevant to 1.5C. In far too many cases, there is an extensive citation of literature that has nothing to do with 1.5C. This chapter should focus on those issues for which there is specific information for 1.5C and leave the rest to the main AR6 report. [Ko Barrett, United States of America]	Agreed. The chapter was sharpened to 1.5°C and text was revised.
40160	14	3			Does the chapter also use non peer-reviewed evidence as allowed by IPCC procedures? [Ko Barrett, United States of America]	Yes it does.
50562	14	3	14	3	I would remove the words "published since the AR5", since the report also uses earlier literature, and rightly so. [Jacob Schewe, Germany]	Accepted. Text was revised.
44914	14	4	14	12	Box 3.7 is not referred in this paragraph. [Hiroaki Kondo, Japan]	Accepted. Text was revised.
30990	14	5	14	5	A good point in the text to clarify the definition of pre-industrial [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Pre-industrial is defined in chapter 1 and the glossary.
17280	14	6	14	6	Delete "levels" [David Schoeman, Australia]	Not applicable - This section was rewritten
3410	14	10	14	11	Replace this sentence by 'Further details are provided in the supplementary material that accompanies this chapter'. [David Docquier, Belgium]	Not applicable - This section was rewritten
7080	14	12			Section 3.2. Assessing 1.5 --> Section 3.2 Assessing 1.5°C [Dmitry L. Musolin, Russian Federation]	Accepted - Figure was revised
15878	14	12			Figure 3.1: Knowledge gaps are not properly addressed in the Executive Summary. [Australia]	Noted, section 3.7 has been revised and two points were elected for the executive summary.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17282	14	12	14	13	Second box from the top in the figure is missing a ºC… [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
39590	14	12	14	12	Insert ""C" in the second box ("Assessing 1.5"). [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
49850	14	12	14	13	This figure seems meaningless. [Erik Kjellström, Sweden]	Accepted. The figure was changed.
55300	14	12	14	12	In Figure 3.1., second box, delete "1.5" [ELISA BERDALET, Spain]	Editorial - copyedit to be completed prior to publication
3412	14	13			Figure 13: The box of Section 3.3 in this figure does not totally agree with the title of the corresponding section in the table of contents. Please make them fit together, e.g. 'Global and regional climate changes and associated hazards'. [David Docquier, Belgium]	Rejected - Figure present a guidance of the information included in each section
3414	14	13			Figure 13: Is it really necessary to make such a figure? Does it bring something? Furthermore, I think there should also be an arrow between Sections 3.3 and 3.4 since climate changes lead to impacts. Therefore, I am not sure this figure is really needed. [David Docquier, Belgium]	Yes, it easily guides the reader through the chapter.
3874	14	13	14	13	Figure 3.1 is not needed [Roderik VAN DE WAL, Netherlands]	Figure was changed.
6030	14	13	14	13	This figure is helpful for navigating the chapter. It is certainly "traditional" in the manner of its sub-divisions (as stated below). However, here the left hand box on Section 3.3. makes no mention of impacts, which is also the traditional approach. Only in the definitions do the climate drivers come to be described as impacts. A second major omission from this diagram, as I will continue to press, ad nauseam, is the socio-economic context for expressing vulnerability and exposure. I would seriously like to see section 3.3 expressed as "Observed and projected pathways of change". Here the critical changes and variations in climate and non-climate factors (of potential importance for impacts) that have been experienced and are projected would be described. After all, not only climate information is required for IAV analysis. Then, even more radical, I would summarise these in a balanced manner in the chapter (section 3.3) starting with the context and then giving the climate, but relegating most of the mass of climate information to a technical appendix rather than supplementary material. That way, the authors' important scientific contributions are recognised and can be located, but the chapter can focus on presenting the fundamentals required for IAV assessment. Then Section 3.4 focuses on both observed and projected impacts, in the traditional sense, whether or not these are based on climate alone or include other stressors too. [Timothy Carter, Finland]	Thank you - the whole chapter 3 was revised to ensure clarity
35876	14	19	14	19	Change 'integrated' to 'integral' [India]	Not applicable - This section was rewritten
55302	14	20	14	20	on the lived experience in the natural world and humans: check this sentence, message not clear [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
49946	14	23	14	25	Many questions on differences between risk and impacts of climate change, given the nature of climate change projections for further assessment. Could you provide a special section or box on the differences between risks and impacts completed with ilustration for wide range of audience? I found you already have Box 3.1 for the definition, but any illustration will help. For example: can we use the term of enabling environment for defining risks? and specific sector or object for defining impact? [Perdinan Perdinan, Indonesia]	Agreed. The Box was moved to Chapter 1.
55304	14	24	14	24	Inconsistently? Find a more appropiate term. [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
17828	15		16		Definition of Risk, Hazard, Vulnerability, and Exposure should be clearly explained. In AR3, it is recommended to assess Vulnerability from Exposure, Sensitivity, and Adaptive Capacity. But AR5 suggested to assess Risk from Exposure, Hazard, and Vulnerabilty. These different suggestion has caused still confusion./. Cui, G., Kwak, H.B., Choi, S.H., Kim, M.I., Lim, C.H., Lee, W.K., Kim, J.S., Chae, Y.R., 2016. Assessing vulnerability of forests to climate change in South Korea. Journal of Forestry Research 27(3):489-503. [Republic of Korea]	The Box was deleted and content moved to Chapter 1, see also definition in the glossary.
35880	15				Box 3.1: Impacts and risks are defined here. Also add - definition of vulnerability. [India]	The Box was deleted and content moved to chapter 1. Vulnerability is defined in the glossary.
39592	15	1	15	1	Insert a space before "Other" in "Box 3.1.Other". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
50780	15	1	15	1	..Box 3.1. Other... instead of "..Box 3.1.Other..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
39594	15	2	15	2	I suggest to replace "glossary" by "Glossary". [Hernan Edgardo Sala, Argentina]	Accepted. Text was revised.
49852	15	5	15	12	If there are boxes on geographic hotspots it can be questions why there is no hotspot on the Arctic as this is the place where warming is most pronounced? Also, what about Box 3.4 and Box 3.7, they are not mentioned here. [Erik Kjellström, Sweden]	Accepted - Figure was revised.
268	15	6	15	6	....focus on geographic..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
502	15	6	15	6	A typo: "focuse on geographic" should be "focus on geographic" [Taoyuan Wei, Norway]	Not applicable - This section was rewritten
17284	15	6	15	6	Replace “focuse” with “focus" [David Schoeman, Australia]	Not applicable - This section was rewritten
19318	15	6			Change focuse to focuses or focus [Aristeidis Koutroulis, Greece]	Not applicable - This section was rewritten
35878	15	6	15	6	Change - 'focuse' to 'focus' [India]	Not applicable - This section was rewritten
44318	15	6	15	6	focus on [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
53642	15	6	15	6	A box can be considered focus on the possible increase of south asian monsoon which would leading towards severe extreme events such as monsoon floods, urban floods, flash floods and lanslides [AKM SAIFUL ISLAM, Bangladesh]	Due to length restrictions it was not possible. This topic has been considered in several parts of the chapter, including the x-chapter box.
60336	15	6	15	6	typo "focuse" [United States of America]	Not applicable - This section was rewritten
1252	15	7	15	7	SIDS) should be "(SIDS)" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
17286	15	7	15	7	Delete ")" [David Schoeman, Australia]	Not applicable - This section was rewritten
18254	15	7	15	7	Please refer to low lying islands and coasts as opposed to SIDS and impacts in these geographically vulnerable areas. This applies to all the report. [Andrea TILCHE, Belgium]	Thanks for the comment. The chapter recognizes that the use of a single terminology or phrase throughout the report would not represent the range of terminologies used, the foci and the issues represented in the literature that this report assesses. In some instances it is appropriate to use "low lying islands and coasts" when referring to islands, or similar terms particularly where the literature assessed focuses on vulnerabilities which hinge primarily on geographical characteristics. This is done in most parts of the chapter. However, in other contexts where the literature considers a range of other factors including a country's economic situation, sustainable development and sovereignty, other phrases (as used in the literature being assessed e.g. SIDS) are more appropriate. This is the case with Box 3.5 which specifically assesses literature focused on SIDS. Additionally, not all islands are low-lying, so a fuller range of impacts and environments need to be considered. The use of particular terms in this report has therefore been given careful consideration but is ultimately being driven by the literature being assessed. The Glossary provides a definition for SIDS.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39596	15	7	15	7	There is an orphan parentheses in "Small Island Developing States, SIDS)". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
60338	15	7	15	7	Extraneous open parenthesis [United States of America]	Not applicable - This section was rewritten
10524	15	8	15	8	“Box 3.3” should be “Box 3.4”. [Hong Yang, Switzerland]	Not applicable - This section was rewritten
44912	15	8	15	8	Box 3.3 --> Box 3.4 [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
55918	15	8	15	8	I believe Box 3.3 should be 3.4 (3.3 is repeated) [Debora Ley, Guatemala]	Not applicable - This section was rewritten
1254	15	10	15	10	remove closing parenthesis at the end of the line/sentence. [Butt Nathalie, Australia]	Not applicable - This section was rewritten
15880	15	10	15	10	Do the authors mean commitment of the USA to limiting warming? [Australia]	Not applicable - This section was rewritten
17288	15	10	15	10	Delete ")" [David Schoeman, Australia]	Not applicable - This section was rewritten
39598	15	10	15	10	There is an orphan parentheses in "global warming to 1.5°C or 2°C).". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
50782	15	10	15	10	where did the parantheses start in "..global warming to 1.5oC to 2.oC)."? [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
60340	15	10	15	10	Box 3.9 does not present "pros and cons of the USA limiting, or not, global warming ..." Edit to be consistent with title and content of Box 3.9. [United States of America]	Agreed. Text is revised.
50784	15	11	15	11	..on land use,.. instead of "..on Land use,.." or "..on Land Use,.." instead of "..on Land use,.." [Amjad Masood, Pakistan]	Accepted. Text was revised.
24198	15	12	15	12	Box 3.2on" on is adjacent [Nazan AN, Turkey]	Not applicable - This section was rewritten
39600	15	12	15	12	Insert space before "on" in: "Box 3.2on". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44320	15	12	15	12	Space is missing after "Box 3.2on" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
50786	15	12	15	12	..warmer worlds.. instaed of "..Warmer worlds.." or "..Warmer Worlds.." intead of "..Warmer worlds.." [Amjad Masood, Pakistan]	Accepted. Text was revised.
7202	15	21	15	22	Shouldn't it say here that Ch5 (esp 5.2) assesses impacts on SD, poverty and inequalities at the level of sub-regions to households? [Petra Tschakert, Australia]	Agreed. Text is revised.
40162	15	23	15	24	Please consider NOT beginning each section and subsection with a summary of relevant knowledge from AR5. This is not the task for this Special Report and contributes to its excessive length. Rather, consider that task one for the main assessment report. If you do that here, you create problems for the main report who either have to repeat your assessment there (those authors will not be happy) or may draw different conclusions under the authorship of a whole different set of authors. All reports in this assessment cycle are synthesized together in the final report. [Ko Barrett, United States of America]	Accepted. The AR5 summary is shortened and the text focussed on 1.5°C/2°C warming.
40164	15	27			The calibrated language is not applied in the ES and is missing in many sections in this chapter. [Ko Barrett, United States of America]	Agreed. The Chapter was revised and the calibrated language was applied.
53038	15	27	15	27	What is IPCC calibrated language? [Thian Gan, Canada]	Not applicable - This text was deleted
56608	15	27	15	28	If the calibrated language is applied throughout, why not in the summary paragraphs. It seems even more important there as people will read these out of context. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Done where applicable.
57694	15	27	16	6	The set of definitions proposed does not appear fully satisfactory and should be developed further for consistent use of language across working groups throughout AR6: The definition of impact and risk should match the risk framework of WGII, now adopted across working groups, with all changes in climate related physics viewed as hazard once they impact vulnerable systems (living, i.e. human and biological systems and their infrastructures) directly at present or in the future. It also seems to make no sense to exclude the use of the term impact from projections into the future. The term resilience is presently under debate and also includes negative aspects in the sense of inertia to change (even if change would be beneficial). [Hans Poertner, Germany]	The Box was deleted and content moved to Chapter 1, see also definition in the glossary.
39602	15	29	15	29	Delete "[START BOX 3.1 HERE]", [Hernan Edgardo Sala, Argentina]	Accepted. Text was revised.
54668	15	29	15	29	omit the text '[start box here]' [Qudsia Zafar, Pakistan]	Accepted.
6026	15	31	16	6	A crucial Box whose contents need to be reflected in the ES. [Timothy Carter, Finland]	Thank you but not applicable. The Box was deleted and content moved to Chapter 1.
14104	15	31	16	5	This box is very similar and more comprehensive than the statement on impacts and risk that appears in chapter 1 page 35 lines 42 to 53. It is intentional so? If it isn't maybe you could either rearrange the box in chapter 1 as a cross chapter box or just insert a reference to the box in chapter 3. It could be better for framing [Meimalin Moreno, Venezuela]	The Box was deleted and content moved to Chapter 1.
15882	15	31	15	47	Is there some guidance on what a low, moderate, high or very high risk of impact means? If so, provide a cross reference here, or consider adding it. [Australia]	The Box was deleted and content moved to Chapter 1.
48222	15	31	16	1	Box 3.1 is consistent with the use of impact and risk defined in Chapter 1. I wonder whether refering to Box 3.1 in Chapter 1 or indicating that the definition of impact and risk is the same across the report in Chapter 3, would improve readability of the repor? [Sarah Connors, France]	The Box was deleted and content moved to Chapter 1.
52602	15	31	15	31	Suggest changing the Box 3.1 title to: "How impact and risk terminology is used throughout this chapter." [Charlotte Roehm, United States of America]	The Box was deleted and content moved to Chapter 1.
56610	15	31	15	47	Does "risk" in the context of this chapter include vulnerability and exposure or is it used more loosely as in e.g. the event attribution literature? Also, projected impacts refer to impacts in the physical system whereas impacts refers to societal impacts as well? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	The Box was deleted and content moved to Chapter 1.
57618	15	31	15	47	This is confusing, in the past impact refers to consequences for human and natural systems but in the future it refers to physical climate. [Hans Poertner, Germany]	The Box was deleted and content moved to Chapter 1.
5754	15	33	15	47	Impacts and risks are defined here. It would be a good idea to also define vulnerability. [Govindasamy Bala, India]	The Box was deleted and content moved to chapter 1. Vulnerability is defined in the glossary.
28202	15	33	15	35	This definition of impacts is not in accordance with the definitions of AR5 and the glossary of this report. It defines only "observed impacts", whereas impacts in general include observed and projected (potential) impact. Please improve consistency with the AR5 definitions as used in this glossary and in the rest of this report. Please see also our comment on the entire report regarding the definition of impacts. [Germany]	The Box was deleted and content moved to Chapter 1, see also definitions in the glossary.
41514	15	33	15	33	delete: or outcomes [Sergio Aquino, Canada]	Not applicable. The Box was deleted and content moved to Chapter 1.
28204	15	36	15	39	This definition of projected impact is not in accordance with the definitions of AR5 and the glossary of this report. It limits the definition of projected impacts only to physical and geophysical systems, whereas in the AR 5 and in the glossary impacts also include effects on human systems. It also creates confusion about what a hazard is and what an projected impact (...consequences of climate change for physical (e.g., air, water, wind) ... systems where there is high confidence in the change and that other drivers would not alter the projection.). Thus please do not use this definition here and delete it. Please see also our comment on the entire report regarding the definition of impacts. [Germany]	The Box was deleted and content moved to Chapter 1, see also definitions in the glossary.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
52604	15	36	15	39	Would suggest including human systems since this chapter is addressing both. [Charlotte Roehm, United States of America]	The Box was deleted and content moved to Chapter 1.
46876	15	37	15	37	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Agreed. The chapter was revised and the calibrated language was applied.
1256	15	38	15	38	replace "that" with "where" [Butt Nathalie, Australia]	Not applicable. The Box was deleted and content moved to Chapter 1.
52606	15	40	15	44	Why is risk related to human-influenced systems only? Given the notion of teleconnections, areas not directly impacted by human-driven impacts may be impacted indirectly by changes in climate. This term of risk should be applicable to both human and natural systems given that natural systems may reach thresholds beyond which they may begin to have large impacts on human and natural systmes. [Charlotte Roehm, United States of America]	The Box was deleted and content moved to Chapter 1, see also definition in the glossary.
1352	16				This section can probably largely be dropped because it should be explained only once for the entire report - preferably close to the beginning. The only relevant question to address here, if at all, is: how does the approach relate to the natural system [Karen Olsen, Denmark]	Not applicable. The section was revised.
6168	16				This section can probably largely be dropped because it should be explained only once for the entire report - preferably close to the beginning. The only relevant question to address here, if at all, is: how does the approach relate to the natural system [Anne Olhoff, Denmark]	Not applicable. The section was revised.
18258	16				This section can probably largely be dropped because it should be explained only once for the entire report - preferably close to the beginning. The only relevant question to address here, if at all, is: how does the approach relate to the natural system [Andrea TILCHE, Belgium]	Not applicable. The section was revised.
46664	16	3	16	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Agreed. The Chapter was revised and the calibrated language was applied.
50684	16	3	16	6	Descripbe the nature of SSP3 (disfunctional, fragmented) to balance sustainable description of SSP1 [Bastiaan van Ruijven, Austria]	Not applicable. The Box was deleted and content moved to Chapter 1.
50788	16	5	16	5	Sustainable Development Pathway (SSPI) instead of "sustainable development pathway (SSPI)" [Amjad Masood, Pakistan]	Not applicable. The Box was deleted and content moved to Chapter 1.
15884	16	6			First mention of SSP3 in this chapter- please expand the acronym. [Australia]	Not applicable. The Box was deleted and content moved to Chapter 1.
44322	16	6	16	6	What is SSP3? [Rita Man Sze Yu, China]	Not applicable. The Box was deleted and content moved to Chapter 1.
53040	16	6	16	6	Box 3.1 has been significantly improved compared to that of the first draft [Thian Gan, Canada]	Not applicable. The Box was deleted and content moved to Chapter 1.
39604	16	8	16	8	Delete "[END BOX 3.1 HERE]". [Hernan Edgardo Sala, Argentina]	Accepted. Text was revised.
54672	16	8	16	8	omit the text '[end box here]' [Qudsia Zafar, Pakistan]	Not applicable. The section was revised.
35304	16	12	16	15	which offers about the changes --> "which offers [an overview?] about the changes" [Ana Bastos, France]	Not applicable - This section was rewritten
40192	16	12	16	12	Notwithstanding: could be Not with standing (but it is week words, delete it will be better) [Amal Hussein, Egypt]	Not applicable - This section was rewritten
52608	16	12	16	15	Suggested change: "Notwithstanding, readership of the entire chapter is strongly encouraged for a comprehensive assessment from currently available scientific literature about the changes in the climate system and the impacts on natural and human system under a global warming of 1.5°C." [Charlotte Roehm, United States of America]	Not applicable - This section was rewritten
1258	16	13	16	13	change "assessment, which offers" to "assessment it offers" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
6474	16	13	16	13	which offers about' should be 'which describes' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
12810	16	13			In the sentence "… which offers about the changes…" there should be an "it" between which and offers. The sentence should read "…which it offers about…". [Marie-Jeanne S. Royer, Canada]	Not applicable. The section was revised.
13934	16	13	16	13	Figure: very cool figure, and seems clear. Except:"Notwithstanding, readership of the entire chapter is strongly encouraged for the comprehensive assessment, which offers about the changes in the climate system and the impacts on natural and human system for global warming of 1.5°C, from presently available scientific literature." I don't know what this sentence means, that the readers should read the whole chapter? or that readers with diverse interests can read it? [Natalie MAHOWALD, United States of America]	Not applicable - This section was rewritten
17290	16	13	16	13	This sentece needs editing for grammar [David Schoeman, Australia]	Not applicable - This section was rewritten
32462	16	13	16	13	which offers about the changes: missing a noun e.g. insight, perspective, detailed explanation [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
44324	16	13	16	13	which offers about the changes [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
56272	16	13	16	13	Offers dicussion? Or rephrase. [Annika Herbert, Australia]	Not applicable - This section was rewritten
57622	16	15	19	46	This section could be condensed with methodology text moving to the SOM or through reference to chapters 1 and 2 [Hans Poertner, Germany]	Accepted. Some information has been moved to SOM or reference to other chapters is made
1350	16	16	16	17	The figure is not informative. Delete [Karen Olsen, Denmark]	The Figure was changed and merged with Figure 3.1.
2390	16	16			Caption should read "cities" not "urban cities" [Debra Roberts, South Africa]	Accepted - Figure was revised
6166	16	16	16	17	The figure is not informative. Delete [Anne Olhoff, Denmark]	The Figure was changed and merged with Figure 3.1.
7204	16	16	16	19	Not clear why a globe is used here, and arrows that have their origin over very specific regions. [Petra Tschakert, Australia]	The Figure was changed and merged with Figure 3.1.
17292	16	16	16	17	In the figure, is there any other type of city than an "Urban City"? [David Schoeman, Australia]	Accepted - Figure was revised
18256	16	16	16	17	The figure is not very informative. We recomend to delete [Andrea TILCHE, Belgium]	The Figure was changed and merged with Figure 3.1.
39958	16	16	16	19	It would be better if the figure has a hyperlink to the subsection for each topic [Adi Nugraha, United States of America]	It is technically impossible to adjoin several linking point within one figure, at least not in such complexity. Sorry.
41326	16	16	16	19	Figure 3.2 is a bit confusing. [Lourdes Tibig, Philippines]	The Figure was changed and merged with Figure 3.1.
52610	16	16	16	16	While the goal of the Figure is solid, the schematic of the figure is somewhat confusing. The representation of the sections covered in the chapter are fine, but their integration in the central diagram are not particularly satisfying. An integrated, multi-scale diagram may be better suited for this purpose that shows not only the sectors, but also the interaction between sectors. As is mentioned a little earlier in the chapter, in order to undertand the scope of the Chapter and thus the scope and breadth of the issues at hand, an integrated approach is crucial. No ecosystem (natural or human) will respond in isolation. [Charlotte Roehm, United States of America]	The Figure was changed and merged with Figure 3.1.
56612	16	16	15	19	The figure is helpful but why do some arrows go to certain geographical areas only (even though there are more areas represented in the subsections) while other not? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	The Figure was changed and merged with Figure 3.1.
57620	16	16	16	18	Why urban cities in Fig 3.2? Should be either urban and settlements or cities and settlements [Hans Poertner, Germany]	Accepted - Figure was revised
7082	16	17			In the figure, words "Urban cities" sounds strange to me… I believed that "urban" always refers to cities. [Dmitry L. Musolin, Russian Federation]	Accepted - Figure was revised

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6028	16	19	16	19	This figure is lacking information on the socioeconomic pathways to match the climate information described at top right. That's probably because the chapter has not synthesised this information to the same level fo detail as the climate. [Timothy Carter, Finland]	Noted. The figure intended to present where the reader could find the information. Figure has been revised.
21748	16	19			I was trying to reproduce this view of planet Earth (Figure 3.2) using different projections, but I was unable. I guess it is a zoom of the Indian Ocean, but not showing the entire sphere. I think its would be better to replace it by a better projection [LUIS VALDES, Spain]	The Figure was changed and merged with Figure 3.1.
43208	16	19	16	19	Urban cities - change this to urban areas, all cities are urban… although not all urban areas are cities.. [Edward Byers, Austria]	Accepted - Figure was revised
62310	16	23	16	23	Please instead of writing " (i.e. physical changes in extremes and associated impacts) (Seneviratne et", write "(i.e. physical changes in extremes and associated impacts; Seneviratne et" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
2258	16	24	17	4	Sounds like the assessment is based almost exclusively on other assessment reports, even if you then say that you also apply methods plublished more recently. I guess that the report does not only apply recent methods but also draws on recent published results and findings. [gerhard Krinner, France]	Rejected. The assessment is based both on previous methods as well as on new methodologies based on the recent literature. The text has been revised to make this point clearer.
3418	16	24	17	4	Reading this paragraph, it is clearer why the whole Chapter 3 is very long. But I stll find that it could be considerably reduced. 248 pages is too much for a single chapter. [David Docquier, Belgium]	Editorial. Number of pages in review version does not correspond to the number of IPCC pages.
52612	16	24	17	4	Is there no auxillary information being used to inform the content of this chapter beyond the IPCC SREX report, 5 chapters in the IPCC WG1 AR5 report and other chapters? It would seem pertinent to bring in much newer data, information, and knowledge that has been published since 2014 in order to make a more effective and currently informed assessment. [Charlotte Roehm, United States of America]	Rejected. There is obviously newer information being considered. The previous text was probably not clear enough on this point. We have revised it to clarify that the underlying evidence includes previous IPCC reports as well as a substantial body of new literature.
1260	16	26	16	26	change "5" to "five" [Butt Nathalie, Australia]	Not applicable - This section was rewritten
53438	16	26	16	26	WG1 should be written as WGI [Seyed Muhammadreza Tabatabaei, Iran]	Not applicable - This section was rewritten
53556	16	26	16	26	WG1 should be written as WGI [mahnaz khazaei, Iran]	Not applicable - This section was rewritten
5576	16	27	16	27	Bindoff et al., 2013b …you did not cte Bindoff et al before therefore it should be Bindoff et al., 2013a….please check in the entire document all the wrong citations [Sandra CASSOTTA, Denmark]	Editorial - copyedit to be completed prior to publication
50792	16	37	16	37	..Box 3.2 on .. instead of "..Box 3.2on .." [Amjad Masood, Pakistan]	Accepted - Text was revised
17806	17		19		1) Summary Table for Cimate models and simulations used in "3.2.1" is needed. If analysis period be included, it would be helpful to clarify understanding the time emerging climate response. 2) Data description for RCP2.6, RCP8.5 CMIP5 runs, used in the main text should be added [Republic of Korea]	Rejected. This information is too detailed and is different for different studies considered. However, the underlying information is available in the referenced studies.
39606	17	1	17	1	For the sake of clarity, I suggest to add a comma after "ecosystems" in: "ecosystems and humans and adaptation options". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
53446	17	1	17	1	WG2 should be written as WGII [Seyed Muhammadreza Tabatabaei, Iran]	Not applicable - This section was rewritten
53564	17	1	17	1	WG2 should be written as WGII [mahnaz khazaei, Iran]	Not applicable - This section was rewritten
41516	17	3	17	4	delete: For …. Assessments methods [Sergio Aquino, Canada]	Not applicable - This section was rewritten
39608	17	7	17	7	For the sake of clarity, I suggest to add a comma after "Section 3.2.1" in: "...presented in Section 3.2.1 and methods used to assess observed impacts and...". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
53440	17	9	17	9	WG1 should be written as WGI [Seyed Muhammadreza Tabatabaei, Iran]	Not applicable - This section was rewritten
53448	17	9	17	9	WG2 should be written as WGII [Seyed Muhammadreza Tabatabaei, Iran]	Not applicable - This section was rewritten
53558	17	9	17	9	WG1 should be written as WGI [mahnaz khazaei, Iran]	Not applicable - This section was rewritten
53566	17	9	17	9	WG2 should be written as WGII [mahnaz khazaei, Iran]	Not applicable - This section was rewritten
61810	17	9	17	9	Please be very explicit on which approaches of the AR5 WGI and WGII differed, and what has been harmonised here. [Valérie Masson-Delmotte, France]	Noted. The text on attribution was now moved to the Annex 3.1. The Annex text makes clearer what are the differences between the two approaches (space needed for this was not available in main chapter).
15886	17	15			The title has "observed" but there is nothing really about observations in the text that follows, more about models simulating said observations and future projections. [Australia]	Accepted. Title was revised.
38670	17	15	17	15	This is a useful section. [Jan Fuglestvedt, Norway]	Noted, thank you.
49104	17	15			This whole section is in a very poor state and requires proof-reading and consistency checks on many levels. [Bill Hare, Germany]	Noted. Text was revised and improved for clarity.
49854	17	15	17	15	How can "observed" changes in climate and weather at 1.5C warming levels be assessed? [Erik Kjellström, Sweden]	Accepted. Title was revised.
49858	17	15	22	13	Other RCM-based studies that could be included are Donnely et al (https://doi.org/10.1007/s10584-017-1971-7), Kjellström et al., 2017 (https://www.earth-syst-dynam-discuss.net/esd-2017-104/#discussion) and Nikulin et al. 2018 (http://iopscience.iop.org/article/10.1088/1748-9326/aab1b1). [Erik Kjellström, Sweden]	Noted. Studies could not be included because of space limitations.
52614	17	15	21	38	While this section is interesting, it appears to be related to the methodology of collection. This information alone would benefit to be in a separate chapter dedicated specifically to the modelling component, or combined with Chapter 2. Alternatively some parts of this could be shortened and moved to Chapter 2. [Charlotte Roehm, United States of America]	Rejected. This methodological information is directly relevant to the assessment of changes in climate extremes and changes in impacts.
53416	17	15	17	15	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Accepted - Sentence was revised
53534	17	15	17	15	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Accepted - Sentence was revised
54676	17	15	17	16	text should be written as 'How are observed and projected climatic changes at 1.5°C comapred to higher levels of warming assessed?' [Qudsia Zafar, Pakistan]	Noted. Issue was noted (use of "observed"), title was revised (with different option).
17294	17	16	17	17	Awkward wording, revise [David Schoeman, Australia]	Accepted - Sentence was revised
3420	17	18	17	22	It is not logical to start explaining the need of climate models for predictions and projections, while the title of this sub-section involves first observations and then projections. I think the first paragraph of this sub-section should be dedicated to observations. Anyway, I do not think this paragraph answers the question of this sub-section, so it could be removed and replaced by an observation-based paragraph. [David Docquier, Belgium]	Accepted, thank you for useful comment. The text was revised and now first addresses observations.
28206	17	20	17	20	Add "and thereafter" after "..over the coming century", because of the long term extensions to 2300. [Germany]	Not applicable - This section was rewritten. Text mentions "over the course of the 21st century and beyond" later in the paragraph.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49948	17	21	17	22	Do we refer to the same definition of impact and risk here? As we use impact models for risk assessment? Readers may confuse as risk and impact have different definition with refer to Box 3.1. [Perdinan Perdinan, Indonesia]	Not applicable - This section was rewritten
6476	17	28	17	28	were to be followed' should be 'was to be followed' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
24190	17	30	17	30	2046-65" should be changed as "2046-2065" [Nazan AN, Turkey]	Editorial - copyedit to be completed prior to publication
53042	17	34	17	34	When will warming reaches 1.5oC or 2oC will depend on the emission pathways or climate scenarios assumed? [Thian Gan, Canada]	Yes on average for single scenarios. But even for the same scenarios, different models will reach that temperature at a different time, depending on their climate sensitivity and also their internal climate variability. Does not require changes in text.
57696	17	36	18	44	This appears as a useful way of contemplating the outcomes of the other chapters for chapter 3 [Hans Poertner, Germany]	Noted, but comment unclear. Not sure how this would affect the consideration of the results from other chapters in chapter 3.
21750	17	37			insert space between "3.2on" [LUIS VALDES, Spain]	Accepted - Text was revised
24200	17	37	17	37	Box 3.2on" on is adjacent [Nazan AN, Turkey]	Accepted - Sentence was revised
39610	17	37	17	37	Insert space before "on" in: "Box 3.2on". [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
3422	17	40			Typo: 'distinguishing'. [David Docquier, Belgium]	Accepted - Text was revised
10292	17	40	18	44	Paragraphs A-E may need to be realigned for a clearer definition of the 1.5°C climate projection and in order to point more straightforward to the four core considerations summarized up in section 3.2.3. [Hungary]	Not applicable anymore. Text has been rewritten, Section 3.2.3 is not included anymore.
11978	17	40	17	47	The use of transient results could be supported by the following paper, which made a rather precise comparison for precip change bewteen transient and stabilised scenarios near 2C and found the differences to be small. Good, Peter, et al. "Large differences in regional precipitation change between a first and second 2 K of global warming." Nature communications 7 (2016): 13667. [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Not included, but could possibly be considered for inclusion prior to publication. Evidence from this article is consistent with the assessment from the chapter.
17810	17	40	17	47	Human-induced warming can't be emphasied enough. In "A.", additional description for the anthropogenic warming and internal variability would be useful. [Republic of Korea]	Rejected. Information should be clear from context. Could not expand text very much due to space constraints.
35882	17	40	17	40	Replace 'distingishing' with 'distinguishing' [India]	Accepted - Sentence was revised
38672	17	40	17	47	Check for consistency across the SR that these three cases are explained in similar terms and same order. [Jan Fuglestvedt, Norway]	Noted. We have tried to keep the nomenclature consistent throughout the chapter.
62312	17	40	18	44	This section would be better if highlighted in tex box [JACQUES-ANDRE NDIONE, Senegal]	Rejected. Information is important and is suitable in main text. In addition, text would be too long for a box.
53044	17	47	17	47	I wonder why SLE to will only be minimally related to the climate scenarios considered? SLE is closely related to the melting of glaciers and Arctic sea ice. Average annual rates of global ice mass change in Gt yr-1 and in SLE (mm yr-1). Melting of 200 Gt yr-1 of ice mass will lead to about 0.5mm of SLE per yr (Marcelon et al., 2012). [Thian Gan, Canada]	Noted. We assume that the reviewer means Sea level rise with SLE? This is the case because of inertia in the system. The scenario does play an important role for the final sea level rise. More information on this is provided in Section 3.3.9.
13936	17	49	18	1	In general, long-term equilibrium stabilization responses could not be… This sentence is redundant [Natalie MAHOWALD, United States of America]	Accepted - Sentence was revised
3426	18	1	18	24	I would revert points B and C, since C is linked to A, more than B is linked to A. [David Docquier, Belgium]	Rejected. Order does not seem critical, and point B seems somewhat more important than C, which is why it is treated first.
6032	18	1	18	11	These are not really 1.5 or 2.0 deg worlds. As is explained here, they are climates resulting from emissions scenarios targeted at 1.5 or 2 deg worlds. So is it valid to include the worlds above those thresholds in an analysis of the risks in those worlds? By definition, the worlds are then above the target. More pertinent, perhaps is the type of world implied by the emissions targeting those temperatures. Given the major implications they would have for land use, social and economic systems, which affects the impacts discussed later in the chapter, it is uncertainties in the emissions pathways that really need to be explored. The target is given as 1.5 or 2 deg. So why include temperature above this in a risk assessment of impacts? Surely that evaluation should be done for climate patterns at those global levels. Then the regional uncertainties are simply based on the patterns of change at those global levels, with the uncertainties arising from natural variability, climate model representation of regional changes, transient vs equilibrium outcomes, and the underlying assumptions of the forcing scenarios. There's a PDF there that could be analysed for attribution. So shouldn't we fix the climate change level, for which there are multiple ensembles of climate responses to map the regional and downscaled uncertainties (including extremes)? Then the interest would be on the impacts/risks under these levels as specified in the Paris Agreement. The likelihood of exceeding these levels is a scientific task relating to the effectiveness of mitigation. It shouldn't have direct relevance for impacts in this context. The only exception for this comes in the next point regarding overshoot. Here it is legitimate to look at temperatures above the thresholds (see comments on next section) [Timothy Carter, Finland]	Rejected. The main issue is that due to internal climate variability, we might not be able to detect that we are on a pathway leading to a higher temperature than 1.5°C. Hence the probability of reaching 1.5°C with the pathways called "1.5°C scenarios" is intrinsically part of this assessment, as well as the impacts that would be caused in the case where emissions scenarios that are deemed "compatible with a 1.5°C target" would fail to deliver this outcome.
38674	18	1	18	11	Important. But unclear what the concrete implciations are for this chapter. [Jan Fuglestvedt, Norway]	Noted. Thanks for noting the importance of this text. The concrete implications are that several analyses provide projections for extremes as a function of global temperature, allowing to assess also impacts that would result from higher levels of warming. Detailed quantitative assessments on this point are also provided in the cross-chapter box on the "1.5° warmer worlds".
49950	18	1	19	47	Can the authors add a discussion on the uncertanity surrounding climate change projections and their interpretation? Winkler et al. 2011 on climate scenario development can be a potential reference. [Perdinan Perdinan, Indonesia]	Rejected. Could not be included because of space limitations.
35038	18	6	18	7	The better representation of sentence could be: This is due to both the discrepancies between models and internal climate variability. [Shaukat Ali, Pakistan]	Editorial - copyedit to be completed prior to publication
49106	18	6	18	7	This is due both to discrepancies between models and internal climate variability. is simply wrong. Internal climate variability has nothing to do with uncertainty in the climate response. And fundamental uncertainty of TCR is not a 'discrepancy' either. This paragraph needs proof-read by Ch 02 authors. [Bill Hare, Germany]	Noted. Internal climate variability can also play a role, but agree that it is minor and not the main point here. Could consider editing it prior to publication, including some point on climate sensitivity (in coordination with chapter 2 authors // see also comment 50564)
50564	18	6	18	6	In order to clarify that this is not simply an issue of imperfect climate models, I think it would be appropriate to mention here that the discrepancies between models reflect, at least in part, uncertainty in estimates of climate sensitivity at large, whether based on models, observations, or paleo reconstructions. See, for instance, http://www.realclimate.org/index.php/archives/2017/08/sensible-questions-on-climate-sensitivity/ for an overview of recent studies of climate sensitivity. [Jacob Schewe, Germany]	Noted. This point is indeed valid but too detailed given space restrictions. But could consider editing it prior to publication (see also comment 49106)

Comment No	From Page	From Line	To Page	To Line	Comment	Response
24192	18	9	18	48	In the some lines "1.5 °C or 2.0 °C" like the line of 9,17 and in the some lines like the line of 26,48 "1.5 °C or 2 °C". It should be the consistency in whole part of the text [Nazan AN, Turkey]	Accepted - Sentence was revised
6034	18	13	18	24	Now overshoot scenarios are a separate category, with respect to risk. This makes an implicit assumption that such conditions ought to be considered by researchers, because the Paris targets are very likely infeasible. Can we justify that assumption, and were researchers actually asked to consider this? Only following that rationale is it reasonable to consider climates outside the levels. As well explained here, these need to be considered separately from the targeted temperatures. In principle, they could overshoot by a wide range of magnitudes and over large differences in time horizon. In reality, of course, these scenarios are in fact much more plausible than many others. It would be important to know at what temperature change levels major irreversibilities begin, and Box 3.5 and Table 3.8 are helpful in that regard. Some synthesis of those findings might be helpful in the ES. At 1.5 deg C we expect these tipping points ; at 2 deg C these; at 2.5 these, etc. Could a figure be constructed with some kind of semi-quantitative score of how many thresholds are crossed per degree C of sustained global warming? The thresholds themselves may be subjectively defined (e.g. is it unacceptable to lose any, 50% or only all of the world's coral reefs?), but if they are defined with caveats, then the reader can judge what is acceptable. Perhaps a tipping point burning embers diagram per sector or per region plus global. Overall, I think the authors have adopted a sensible approach here. Overshoot needs to be mentioned, but is really largely outside the remit, especially concerning impacts. HOWEVER, the readership needs some sense of what missing the targets would mean. AR6 should indeed look at this in more detail. [Timothy Carter, Finland]	Noted. Agree with reviewer that impacts of overshooting are important (and as mentioned in this text would need to be addressed in the AR6). Unfortunately, there is too little literature on this point at the moment to provide a more detailed assessments on this in the SR15. Also pace of change would be critical to assess. Some of these points are thematised in more depth in the cross-chapter box on the "1.5 warmer worlds".
41328	18	15	21	13	The explanation on how assessments have been done provide for some level of understanding that is highly technical for policy makers. Can a summary in table form be done? [Lourdes Tibig, Philippines]	Rejected. A table was not considered easier to interpret.
7046	18	18	19	25	Lad degradation - agro ecosystem productivity chemical based [Cate Tuitt, United Kingdom (of Great Britain and Northern Ireland)]	unclear what this comment refers to
3424	18	23			Separate '3.2' and 'on'. [David Docquier, Belgium]	Accepted - Sentence was revised
6478	18	23	18	23	Box 3.2on' should be 'Box 3.2 on' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
12812	18	23			…Cross-Chapter Box 3.2on… there should be a space between "3.2" and "on" [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised
21752	18	23			insert space between "3.2on" [LUIS VALDES, Spain]	Accepted - Sentence was revised
38676	18	23	18	23	Not sure if "definition" is the right word here. [Jan Fuglestvedt, Norway]	Editorial. Agree, this is a typo. Will replace "definition and questions" with "questions". Edit to be completed prior to publication.
39612	18	23	18	23	Insert space before "on" in: "Box 3.2on". [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
44326	18	23	18	23	Space is missing after "Box 3.2on" [Rita Man Sze Yu, China]	Accepted - Sentence was revised
50794	18	23	18	23	..Box 3.2 on '1.5oC..'.. .. instead of "..Box 3.2on '1.5o ..'.." [Amjad Masood, Pakistan]	Accepted - Sentence was revised
54680	18	23	18	23	space between '3.2' and 'on' [Qudsia Zafar, Pakistan]	Accepted. Was corrected.
39614	18	24	18	24	Instead of "in the IPCC AR6 report", use simply "in the IPCC AR6". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
53644	18	24	18	24	The issues of over shoot has also been discussed in Chapter 1 of this report [AKM SAIFUL ISLAM, Bangladesh]	Noted. Will check that chapter 1 text is consistent chapter 3 prior to publication.
28208	18	26	18	37	Please ensure that the following background information is considered in the text to prevent misinterpretation: If the warming periods are calculated relative to observed pre-industrial values, the real warming of the models in these periods relative to their own pre-industrial control run diverges from 1.5°C (because model pre-industrial control values are different from "measured" pre-industrial values). This means that periods are used for the assessment of 1.5°C global warming, in which the models are more/less than 1.5°C out of their equilibrium (derived from piControl simulations). [Germany]	Rejected. This discussion does not belong in this chapter. These questions are addressed in chapter 1.
49108	18	26			The following paragraph is not aligned with Ch 01. And "The meaning of “1.5°C or 2°C” climate was not defined prior to this report" is bad drafting or simply incorrect. Either, we knew already what these warming levels refer to (which clearly is the case in the AR5). Or we didn't, but then we also don't 'define' it in this repirt [Bill Hare, Germany]	Rejected. As is clear both from chapter 1 and this chapter, several aspects needed more detailed interpretation. For instance, the relevance pre-industrial period to be considered.
54300	18	26	18	37	More inter-chapter consistency required regarding defintion of pre-industrial - also with other chapters e.g. Chp 1, where 1850-1900 is stated. There is a cited study later in Chapter 3 (p61, line 33), which also refers to 1850-1900. [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text was coordinated with chapter 1. FGD text refers to chapter 1, as well as to the cross-chapter box on 1.5°C warmer world, which was written with chapter 1 authors.
43210	18	30	18	34	The importance of the pre-industrial baseline selection (e.g. 0.5, 0.6, 0.7°C), as recently shown in a recent paper - should probably be noted somewhere in this introductory section: See this work here: https://www.nature.com/articles/nclimate3345 [Edward Byers, Austria]	Rejected. This discussion does not belong in this chapter. These questions are addressed in chapter 1.
17808	18	31	18	33	To understand "human-induced warming in the absense of secular trend in natural forcing", natural variability (e.g., decadal oscilation) and data (e.g., multi-model ensemble) description are needed, since natural variability could give substantial impact depending on the length of assessed period (20, 30 years) and the chosen period (near term , mid or end 21st century). [Republic of Korea]	Noted. Agree, but this topic belongs in chapter 1, not chapter 3.
37146	18	31	18	33	Chapter 3 defines the pre industrial period (1850-1879) inconsistently with the definition in Chapter 1 (1850-1900). [John Sweeney, Ireland]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
522	18	33	18	33	The reference period used here is different than in Chapter 1. [Robert Koppu, United States of America]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
6036	18	33	18	33	Why is this 30-year period used here? This is mentioned as being very similar to 1850-1900 (as used in AR5), but is of course a 30-year period (standard WMO) and may be more comparable to future 30-year periods commonly adopted in IAV studies. [Timothy Carter, Finland]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
15888	18	33	18	33	1.5oC relative to pre-industrial (1850-1879). For more context, it is useful to also report 0.5oC (?) relative to the present (2010-2018?) (i.e. we are one third of the way there?). [Australia]	Noted. Definition of present-day is addressed in chapter 1.
15890	18	33	18	33	Wrong reference period - should be 1850-1900 (e.g. Chapter 1 p 14 li 37) [Australia]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
17646	18	33	18	33	The pre-industrial reference period should be 1850-1900 (Lines 36-37, Ch.1). [Sai Ming Lee, China]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
29338	18	33	18	33	As reference period, 1850-1879 is mentioned. Chapter 1 considers the period 1850-1900 as pre-industrial reference period (page 1-16, Chapter 1.2.1.2). Although they mention that average temperatures over 1850–1879 are less than 0.01°C from the average for 1850–1900, some argumentation to this in Chapter 3 would be also essential. [Borbala Galos, Hungary]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
38678	18	33	18	37	Check consistency with ch1 re periode for pre-industrial period. [Jan Fuglestvedt, Norway]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
53046	18	33	18	33	1.5oC is the global average increase over the pre-industrial period. Since Industrial Revolution occurred from 1750 to 1850, why setting the the reference industrial period over 1850-1879? [Thian Gan, Canada]	Noted. This question is addressed in chapter 1, not chapter 3.
53646	18	33	18	33	This Chapter defines pre-industrial reference period as 1850–1879 whereas Chapter 1 defines it as 1850-1900 [AKM SAIFUL ISLAM, Bangladesh]	Accepted. This was corrected throughout the chapter and the FGD text refers to chapter 1 here.
39616	18	36	18	36	Start with upper-case: "Cross-Chapter Box". [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
57564	18	36	18	36	Cross-Chapter Box (with capital letters) [Hans Poertner, Germany]	Accepted - Sentence was revised
6038	18	39	18	44	This is simply part of the forcing uncertainty associated with target levels of temperature change (as commented on earlier). It also emphasises the importance of judging impacts in their (uncertain) context; here this is most commonly land use change or atmospheric composition that may alter the local climate (relative to no land use change or other atmospheric composition for the same mean annual temperature change), while at the same time presumably themselves acting as co-stressors on the resource base and/or population, with the local climate change. [Timothy Carter, Finland]	Rejected. This is not the uncertainty associated with global climate sensitivity, but with the regional response, i.e. "regional climate sensitivity".
15892	18	39	18	39	replace "interference" with "interaction" [Australia]	Rejected. "Interference" seems more suitable.
3428	18	40			Not only biophysical feedbacks, but all climate-related feedbacks (e.g. surface albedo feedback) can strongly affect regional climate. [David Docquier, Belgium]	Rejected. This is only included as example. In addition, biophysical feedbacks include surface albedo feedbacks related to vegetation, and are the most relevant for IAM because of the extensive use of BECCS and bioenergy in the high-mitigation pathways.
12814	18	40			(e.g.,, Hirsch et al., 2017;… there is an extra "," [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised
21754	18	40			Remove a comma after e.g,, [LUIS VALDES, Spain]	Accepted - Sentence was revised
50796	18	40	18	40	...(e.g., ... instead of "..(e.g.,, ..." [Amjad Masood, Pakistan]	Accepted - Sentence was revised
60342	18	40	18	40	Duplicate commas after e.g. [United States of America]	Accepted - Sentence was revised
21756	18	41			It seems to me that megacities should be mentioned here [LUIS VALDES, Spain]	Rejected. Too detailed in this context.
61814	18	46	19	7	What are the implications of these gaps for the assessment? I could not find easily where this is provided (difference between equilibrium and transient change;precise, case study examples of impacts of scenarios (eg. land use, short lived climate forcers such as aerosols) for regional climate. [Valérie Masson-Delmotte, France]	Not applicable. This text was rewritten. Note that the implications of these gaps in the case of the use of transient scenarios for the 1.5°C assessments are briefly addressed in the FGD on page 19 in the paragraph starting with "In some cases, assessments for short-term stabilization responses...".
6040	19	1	19	3	There have been some similar runs conducted, including the "commitment runs" reported in the AR4, fixing 2000 emissions. So, is there really an indication that the equilibrium patterns of change and characterisitcs of weather extremes will be much different from what can be learnt from existing information? Is this even a reasonable question to pose? Would 1.5 deg C be the level of warming of choice to reach equilibrium at, or might there be different opinions of the aspirational level? This would be especially pertinent if means were found for extracting GHGs from the atmsophere. What level should humanity choose then? Small Island states might opt for pre-industrial. High latitude regions, probably not, with the risk of lapsing into Little Ice Age conditions. Cooling is a more profound risk in some regions than warming, at least close to pre-industrial levels. [Timothy Carter, Finland]	Noted. We are not aware of such analyses from the literature.
1782	19	2	19	2	This shortfall needs to be addressed, to the extent possible, in AR6 based on new literature that will be available by the time of its compilation. Otherwise, the sentence creates certainty that it will be possible to address the gap in AR6 (which may not be the case). [Greece]	Noted. This edit was not included but could be a useful caveat. Will consider to include it prior to publication, also based on AR6 zero-order draft.
30992	19	2	19	3	I couldn't agree more with the point about providing long-term equilibrium scenario simulations. However, there is nothing substantial in the CMIP6 plans to provide this. Hence, this sentence is 'set up to fail'. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Will possibly make an edit as suggested in comment #1782 prior to publication, also depending on status of AR6 zero-order draft (I.e. whether there are indication that this will be addressed in the AR6).
12816	19	3			changes in climate at 1.5° global… is missing the "C" for celsius after 1.5° [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
24202	19	3	19	3	at 1.5"" there is no C [Nazan AN, Turkey]	Not applicable - This section was rewritten
6480	19	5	19	5	are not tied to reductions of greenhouse gas emissions or concentrations are' should be 'which are not tied to reductions of greenhouse gas emissions or concentrations, are' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
50566	19	5	19	5	remove ", are" after "measures" [Jacob Schewe, Germany]	Not applicable - This section was rewritten
28210	19	9	19	16	Please ensure that following background information are considered in the text to prevent misinterpretation: If the warming periods are calculated relative to observed pre-industrial values, the real warming of the models in these periods relative to their own pre-industrial control run diverges from 1.5°C (because model pre-industrial control values are different from "measured" pre-industrial values). This means that periods are used for the assessment of 1.5°C global warming, in which the models are more/less than 1.5°C out of their equilibrium (derived from piControl simulations). [Germany]	Rejected. The sampling periods are based on the temperature in the respective models. Hence, the global temperature in the simulations is the same, it is the considered time frame that differ.
49860	19	9	19	28	The DMI-paper by Maule et al (2017) saying stg on differences for the European climate in a 2C world based on RCP4.5 and RCP8.5 should be mentioned here. [Erik Kjellström, Sweden]	Rejected. Too detailed given space limitations.
54296	19	9	19	15	A slightly more involved description of time sampling approach could be useful, to state that it might be an average of a time period centred on the point of reaching 1.5 degrees, rather than a point sample. [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. This is too detailed given the space limitations.
3430	19	10			Replace 'use' by 'uses'. [David Docquier, Belgium]	Accepted - Sentence was revised
3432	19	11			Add '(GCM)' after 'global climate model'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
2252	19	12	19	15	I think it should be acknowledged, however, that this approach assumes that a 1.5 warmer world is the same according to all RCPs, which is not necessarily the case. See e.g. Bärring and Strandberg, 2017. Does the projected pathway to global warming targets matter? https://doi.org/10.1088/1748-9326/aa9f72 [Gustav Strandberg, Sweden]	Rejected. This topic is addressed in the section (see paragraph starting with "In some cases, assessments for short-term stabilization responses..."). But we cannot provide more in depth material because of space limitations.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
10394	19	12	19	12	maybe add here that Frieler K, S Lange, F Piontek, CPO Reyer, J Schewe, L Warszawski, F Zhao, L Chini, S Denvil, K Emanuel, T Geiger, K Halladay, G Hurtt, M Mengel, D Murakami, S Ostberg, A Popp, R Riva, M Stevanovic, T Suzuki, J Volkholz, E Burke, P Ciais, K Ebi, TD Eddy, J Elliott, E Galbraith, SN Gosling, F Hattermann, T Hickler, J Hinkel, C Hof, V Huber, J Jägermeyr, V Krysanova, R Marcé, H Müller Schmied, I Mouratiadou, D Pierson, DP Tittensor, R Vautard, M van Vliet, MF Biber, RA Betts, B Bodirsky, D Deryng, S Frolking, CD Jones, HK Lotze, H Lotze-Campen, R Sahapal, K Thonicke, H Tian, Y Yamagata (2017) Assessing the impacts of 1.5°C global warming - simulation protocol of the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP2b). Geoscientific Model Development. 10, 4321–4345 doi.org/10.5194/gmd-10-4321-2017 provide climate scenarios for multi-model, cross-sectoral impact simulations using time window sampling [Christopher Reyer, Germany]	Rejected. This section deals with climate aspects not impact analyses. But the mentioned article is now referenced in the following section.
49856	19	13	19	15	It is awkward mentioning only the IMPACT2C project. There are others, if you want to mention another European one "HELIX" could be mentioned (it also started with 2C (and 4C and 6C) but did some work on 1.5C at the end). I don't see the need for naming European (or any other) research projects here, focus on giving the appropriate citations to the scientific literature instead. If IMPACT2C should be mentioned it should be without a degree sign in the name. [Erik Kjellström, Sweden]	Noted. Will consider editing prior to publication (either removing reference or including further similar references to other projects)
50798	19	13	19	13	Regional Climate Model (RCM).. instead of "regional climate model (RCM).." [Amjad Masood, Pakistan]	Accepted - Reference was edited
50800	19	13	19	13	...RCM output.. instead of "...RCM model output.." [Amjad Masood, Pakistan]	Editorial - copyedit to be completed prior to publication
3434	19	14			Replace 'global climate model (GCM)' by 'GCM'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
50802	19	14	19	14	...Global Climate Model (GCM).. instead of "...global climate model (GCM).." [Amjad Masood, Pakistan]	Accepted - Sentence was revised
8024	19	16	19	20	A comparison of 1.5C warming projected by pattern scaling method and multimodel ensemble mean of CMIP5 models reveals a close similarity (See Fig.5 and 6 of the following paper): Chen Xiaolong,Zhou Tianjun. 2017. Surface air temperature projection under 1. 5 ? warming threshold based on corrected pattern scaling technique[J]. Advances in Earth Science, 2017,32(4):435-445,doi:10.11867/j.issn.1001-8166.2017.04.0435 [in Chinese with English abstract]. [Tianjun Zhou, China]	Noted. This reference was not added due to space limitation, but may be added in the Annex prior to publication.
53048	19	16	19	16	Given the disadvantage of pattern scaling which is not expected to emulate climate models' response at local scale, why it is still used to derive specific climatic responses to global warming? [Thian Gan, Canada]	Noted. Most assessments of the chapter are not based on pattern scaling. However, given that the literature on 1.5°C warming is scarce, it was considered useful to also consider some publications using this approach.
60344	19	16	19	16	Santer et al. (1990) reference for pattern scaling may be included. [United States of America]	Rejected. Too old and not directly relevant to SR15 assessment. Readers can refer to previous IPCC reports for more in-depth background on pattern scaling.
50570	19	20	19	23	Either here or in the Supplementary Information, the expert judgment methodology should be explained in more detail. It's not clear to me whether the expert "opinion" comes into play only when deciding on the precise color gradient in the updated burning embers diagram, or if there are other steps involved that rely on expert judgment, rather than being supported by published evidence. [Jacob Schewe, Germany]	Rejected. Expert judgment is already introduced in previous IPCC reports. In addition, the derivation of the burning embers diagrams is introduced elsewhere in the chapter and follows the same approach as in AR5. It will be considered prior to publication if more background on the burning embers diagram may need to be provided in the Annex.
3462	19	23	19	28	These two sentences could constitute the first paragraph of Section 3.2.1 as it is related to observations. [David Docquier, Belgium]	Accepted - First paragraph of Section 3.2.1 was revised accordingly.
50568	19	23	19	23	Here and elsewhere, when referring to "Supplementary Information", please also indicate Annex 3.1 where this Information can be found. [Jacob Schewe, Germany]	Accepted - Sentence was revised
50804	19	23	19	23	...above the pre-industrial period/time.. instead of "...above the pre-industrial.." [Amjad Masood, Pakistan]	Editorial - copyedit to be completed prior to publication
6042	19	26	19	28	Shouldn't this logic relating to possible non-linear responses, also apply to use of responses to the same increment but at a higher level (e.g. as stated above, in lines 21-23 for differences between present and +3 deg C? [Timothy Carter, Finland]	Rejected. The report is about 1.5°C warmer climate, hence it is not relevant to discuss in detail what would happen at +3°C global warming.
49110	19	30			Short-term stabilisation is very misleading as 'short term' would In fact, the HAPPI simulations are as stable and long-term as one could get in the 21st century. [Bill Hare, Germany]	Rejected. Does not understand comment. "Short-term stabilization" seems appropriate and not other reviewers commented on this point.
19320	19	31			Delete "using" [Aristeidis Koutroulis, Greece]	Editorial - copyedit to be completed prior to publication
50806	19	31	19	32	...Sea Surface Temperature (SST)... intsead of "...sea surface temperature (SST)..." [Amjad Masood, Pakistan]	Accepted - Sentence was revised
50808	19	32	19	33	.... "Half-a-degree Additional-warming, Prognosis and Projected Impacts (HAPPI) project".... instead of .... "Half a degree additional warming, prognosis and projected impacts" (HAPPI) project".... [Amjad Masood, Pakistan]	Editorial - copyedit to be completed prior to publication
61818	19	33	19	33	explain the design of the HAPPI project [Valérie Masson-Delmotte, France]	Rejected. The text could not be expanded on this point because of space limitations. It now refers to chapter 1, where the HAPPI project is presented.
6044	19	35	19	35	The word "that" is confusing here - should it be deleted? [Timothy Carter, Finland]	Accepted - Sentence was revised
31030	19	35	19	35	scenario) are very similar [Rafiq Hamdi, Belgium]	unclear what this comment refers to
39618	19	35	19	35	I suggest to delete "that" in this line. [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
60346	19	35	19	35	Revise "that are very similar" to "are very similar" for better clarity. [United States of America]	Accepted - Sentence was revised
2260	19	36	19	36	Here and in many other places, the references are not complete yet; I guess this will be corrected at a later stage [gerhard Krinner, France]	Editorial - copyedit to be completed prior to publication
17296	19	36	19	36	Delete "that" [David Schoeman, Australia]	Accepted - Sentence was revised
21758	19	36			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Sentence was revised
52616	19	36	19	36	Missing Ref. [Charlotte Roehm, United States of America]	Accepted - Sentence was revised
54686	19	36	19	36	Seneviratne et al. reference correction throughout the text [Qudsia Zafar, Pakistan]	Accepted - Reference was edited
62314	19	36	19	36	In the reference "Seneviratne et al." it's missing the year [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Sentence was revised
116	19	40	19	40	theassessment to be changed in "the assessment" [teodoro georgiadis, Italy]	Accepted - Sentence was revised
269	19	40	19	40	For the assessment of ..... [Paul Doyle, Canada]	Accepted - Sentence was revised
504	19	40	19	40	A typo: "For theassessment" should be "For the assessment" [Taoyuan Wei, Norway]	Accepted - Sentence was revised
2262	19	40	19	40	Many typos remain throughout the text, e.g. here "theassessment". Surely this will be proofread thoroughly [gerhard Krinner, France]	Accepted - Sentence was revised
3436	19	40			Separate 'the' and 'assessment'. [David Docquier, Belgium]	Accepted - Sentence was revised
6482	19	40	19	40	For theassessment of' should be 'For the assessment of' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
7084	19	40			theassessment --> the assessment [Dmitry L. Musolin, Russian Federation]	Accepted - Sentence was revised
7786	19	40			space between the and assessment [Anthony Lupo, United States of America]	Accepted - Sentence was revised
10676	19	40	19	40	Change to 'For the assessment …' [Franklin Paredes, Brazil]	Accepted - Sentence was revised
12818	19	40			For theassessment of… there should be a space between "the" and "assessment". [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised

Comment No	From Page	From Line	To Page	To Line	Comment	Response
19322	19	40			Insert a space to theassessment [Aristeidis Koutroulis, Greece]	Accepted - Sentence was revised
21760	19	40			insert space between "theassessment" [LUIS VALDES, Spain]	Accepted - Sentence was revised
29406	19	40	19	40	A space is missing between "the" and "assessment". [Joan A. Lopez-Bustins, Spain]	Accepted - Sentence was revised
35040	19	40	19	40	theassessment should changed to "the assessment" [Shaukat Ali, Pakistan]	Accepted - Sentence was revised
35306	19	40	19	40	fortheassessment --> separate words [Ana Bastos, France]	Accepted - Sentence was revised
35884	19	40	19	40	Add space between the words 'the' and 'assessment' [India]	Accepted - Sentence was revised
39620	19	40	19	40	Insert space in "theassessment". [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
40194	19	40	19	40	please make a space between "the" and "assessment" [Amal Hussein, Egypt]	Accepted - Sentence was revised
41518	19	40	19	40	For the assessment [Sergio Aquino, Canada]	Accepted - Sentence was revised
44328	19	40	19	40	Space is missing after "For theassessment" [Rita Man Sze Yu, China]	Accepted - Sentence was revised
44916	19	40	19	40	theassessment --> the assessment [Hiroaki Kondo, Japan]	Accepted - Sentence was revised
49420	19	40	19	40	add the space between 'the' and 'assessment' [Alexander Chernokulsky, Russian Federation]	Accepted - Sentence was revised
50810	19	40	19	40	For the assessment of ... instead of "For theassessment of ..." [Amjad Masood, Pakistan]	Accepted - Sentence was revised
50964	19	40	19	40	For theassessment needs space between the and assessment [Fatima Driouech, Morocco]	Accepted - Sentence was revised
54684	19	40	19	40	space between 'the' and ' assessment' [Qudsia Zafar, Pakistan]	Accepted - Sentence was revised
60348	19	40	19	40	Include space in "theassessment" [United States of America]	Accepted - Sentence was revised
61820	19	44	19	47	I suggest to move the few lines of the supplemenary material related to the use of attribution here. They are hidden in the supplementary material while relevant for implications of changes when GMST increased by 0.5°C. [Valérie Masson-Delmotte, France]	Rejected. Could not be included because of space limitations. Depending on material of SPM, will consider moving some material from the Annex to the main text on this topic, if this seems relevant.
49112	20	1			The content of this section appears to be very similar to the one before. Although in parts in an even poorer state. (an example: "Global warming (e.g., of 1.5°C or 2°C) is based on a global average of the daily temperature"...) [Bill Hare, Germany]	Noted. The text was substantially revised.
49422	20	1	20	49	Some approaches for impact assessing deal with total warming (anthropogenic + natural), but not with 'human-inducing warming' only. This point is highlighted in the 1.2.1.3 section and should be mentioned here as well (with the reference ot the 1.2.1.3 section). [Alexander Chernokulsky, Russian Federation]	rather 1.2.1.2; but because of space limitation, it is difficult to repeat
50584	20	1	21	19	I don't understand the logic of what is discussed here in section 3.2.2 vs. what is discussed in the Supplement, SI_S3-2. My impression is that given the discussion in the Supplement, section 3.2.2 could by shortened substantially, to just mention the most important aspects and otherwise referring to the Supplement. [Jacob Schewe, Germany]	The section has been much shortened
53418	20	1	20	1	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Accepted - Sentence was revised
53536	20	1	20	1	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Accepted - Sentence was revised
15894	20	3	20	3	Replace "known" with "already observed" for consistency with the rest of the paragraph [Australia]	Accepted - Sentence was revised
56614	20	3	20	8	I don't understand the paragraph. Are you simply trying to say that we we can't observe impacts of 1.5 given we have only reached a global warming of 1? Or is there something more substntial? Please rephrase. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	yes it is the point; sentence has been improved
61828	20	3	21	19	This section could be shorter and sharper, building on the summary. [Valérie Masson-Delmotte, France]	done - this part has been much shortened
35042	20	5	20	5	a global warming "a" may be removed [Shaukat Ali, Pakistan]	Editorial - copyedit to be completed prior to publication
35044	20	6	20	6	The word "assessing impacts" should be more approriate instead of detecting impacts. [Shaukat Ali, Pakistan]	Accepted - Sentence was revised
10294	20	10	20	11	The approach of multiplication by a 1.5 factor might be too oversimplified and misleading here in terms of numerical quantification, when speaking about sensitivity of various systems in general. [Hungary]	It is true, but sometimes, there is no other solutions
28212	20	10	20	14	Like in lines 26-28 of page 19 it should be mentioned that non-linear effects could change the results. [Germany]	this part has been removed
30858	20	10	20	12	This seems a very rough approximation and based on one reference only. Also, can this be applied to ALL sorts of "observed impacts"? [Érika Mata, Sweden]	The paper of Schleussner et al 2017 shows several examples; this approach is complementary to more complex ones and is useful to better analyse the relationship between the global signal and the local impact
54632	20	10	20	11	This assumption seems very rough, if not irrelevant when considering natural systems. There is no reason to think that impacts will be proportional to the temperature increase. And major risks will likely be those not linearly related to the temperature increase. This should be ackowledged here. [Nadine Le Bris, France]	It is true and it has been acknowledged: it assumes a strong dependence of the ecosystem on temperature; the idea is to present a palette of methods from the simplistic ones to more complex ones
5578	20	11	20	11	do you have a reference for ...This provides a first ?approximation of trends and relies on the assumption of linear dynamics….I think that the trend could be non-linear…do you have evidence for using the approximation of a linear dynamic? [Sandra CASSOTTA, Denmark]	this part has been removed
1784	20	12	20	13	It may be too weak if dynamics are exponential instead of linear. [Greece]	Noted. This approach is complementary to more complex ones and is useful to better analyse the relationship between the global signal and the local impact
17298	20	12	20	17	These senteces need editing for grammar [David Schoeman, Australia]	Accepted - Sentence was revised
53050	20	13	20	13	I believe approximating dynamics of climate change by a linear approximation may under estimate the impact of global warming at 1.5oC. [Thian Gan, Canada]	Noted. This approach is complementary to more complex ones and is useful to better analyse the relationship between the global signal and the local impact
12820	20	14			…half a degree warming(e.g., … there should be a space between "warming" and "(" [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised
39622	20	14	20	14	Insert space before the opening parenthesis. [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
50812	20	14	20	14	warming (e.g.,... instead of "warming(e.g.,..." [Amjad Masood, Pakistan]	Accepted - Sentence was revised
56274	20	14	20	14	Change to: "frameworks are being…" [Annika Herbert, Australia]	unclear what this comment refers to
62316	20	14	20	14	Instead of writing "half a degree warming(e.g., Schleussner et al. 2017).", please write "half a degree warming (e.g., Schleussner et al. 2017)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Sentence was revised
9064	20	15			The sentence " ..., is to use conclusions from paleontological data combined with …" is not correct. This second approach refers to "paleodata" or "data from paleorecords" (that includes geochemical data as well as data from fossil organisms). It should be "..., is to use conclusions from paleodata combined with ..." [Alejandro Cearreta, Spain]	It is right; paleontological data have been replaced by past data
61822	20	15	20	15	not paleontological data (evidence from past warm climates). [Valérie Masson-Delmotte, France]	Accepted - Sentence was revised
41520	20	19	20	19	extra space before The latter [Sergio Aquino, Canada]	Accepted - Sentence was revised

Comment No	From Page	From Line	To Page	To Line	Comment	Response
50574	20	20	20	20	I recommend replacing "'tune'" by "calibrate" (without quotes) [Jacob Schewe, Germany]	Accepted - Sentence was revised
54636	20	20	20	20	This third approach is the most robust to assess major risks due to combination of stressors, but might be limited knowledge of the system considered. [Nadine Le Bris, France]	Noted. We agree
10396	20	22	20	35	maybe add here the paper by Frieler K, S Lange, F Piontek, CPO Reyer, J Schewe, L Warszawski, F Zhao, L Chini, S Denvil, K Emanuel, T Geiger, K Halladay, G Hurtt, M Mengel, D Murakami, S Ostberg, A Popp, R Riva, M Stevanovic, T Suzuki, J Volkholz, E Burke, P Cials, K Ebi, TD Eddy, J Elliott, E Galbraith, SN Gosling, F Hattermann, T Hickler, J Hinkel, C Hof, V Huber, J Jägermeyr, V Krysanova, R Marcé, H Müller Schmied, I Mouratiadou, D Pierson, DP Tittensor, R Vautard, M van Vliet, MF Biber, RA Betts, B Bodirsky, D Deryng, S Frolking, CD Jones, HK Lotze, H Lotze-Campen, R Sahapal, K Thonicke, H Tian, Y Yamagata (2017) Assessing the impacts of 1.5°C global warming - simulation protocol of the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP2b). Geoscientific Model Development. 10, 4321–4345 doi.org/10.5194/gmd-10-4321-2017 that provides several GCMs for impact simulations. some stabilization at 1.5 degress, some useful for time-woindow sampling [Christopher Reyer, Germany]	Accepted - Sentence was revised
19324	20	22	20	35	This section contains information on risk assessment based on offline impact models. These models are usually driven by bias adjusted climate inputs. Depending on the bias adjustment method (especially for methods that do not preserve trends), the signal of the bias adjusted parameter, including temperature that is used to define warming level, is modified (Grillakis et al., https://www.earth-syst-dynam.net/8/889/2017/). As a result, the risks simulated from the impact model can correspond to a different global warming level (even slightly different). This has to be clearly referred in the report. [Aristeidis Koutroulis, Greece]	Accepted - Sentence was revised
12822	20	23			…impacts at 1.5 or 2°C… there should be "°C" after "1.5" [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised
24204	20	23	20	23	at 1.5 or 2°C" there is no °C after 1.5 [Nazan AN, Turkey]	Accepted - Sentence was revised
61824	20	23	20	23	I am not sure that scenarios have been introduced in this chapter (e.g. RCP). Call the x chapter box on scenarios for details. [Valérie Masson-Delmotte, France]	Noted. This section refers to the cross-chapter box on 1.5°C warmer worlds for more details on aspects of scenarios, and that cross-chapter box refers to the box on scenarios. But it could be considered to add a reference to the cross-chapter box on scenarios as well prior to publication.
17300	20	24	20	24	Replace "to" with "with". [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
60350	20	24	20	24	Revise "associated to" to "associated with" [United States of America]	Editorial - copyedit to be completed prior to publication
1786	20	25	20	25	Delete the second 'level'. [Greece]	Editorial - copyedit to be completed prior to publication
54298	20	25	20	26	Time sampling discussed in 3.2.1, not 3.2.2. [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Sentence was revised
28214	20	26	20	30	Please ensure that following background information are considered in the text to prevent misinterpretation: If the warming periods are calculated relative to observed pre-industrial values, the real warming of the models in these periods relative to their own pre-industrial control run diverges from 1.5°C (because model pre-industrial control values are different from "measured" pre-industrial values). This means that periods are used for the assessment of 1.5°C global warming, in which the models are more/less than 1.5°C out of their equilibrium (derived from piControl simulations). [Germany]	This is the topic of chapter 1
44918	20	26	20	30	This paragraph is inside of section 3.2.2, however, says 'see also section 3.2.2'. Is this OK? [Hiroaki Kondo, Japan]	Accepted - Sentence was revised
50576	20	26	20	38	In lines 26 and 38, reference is made to "section 3.2.2", which however is the number of the present section. Please insert number of the relevant section to which reference is made. [Jacob Schewe, Germany]	Accepted - Sentence was revised
62318	20	26	20	26	Instead of writing "scenarios, as described by James et al. (2017) (see also Section 3.2.2).", please write "scenarios, as described by James et al. (2017; see also Section 3.2.2)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Sentence was revised
103	20	30	20	30	Lizumi et al. (2017) (doi:10.1038/s41598-017-08214-4) should be Iizumi et al. (2017). Family names starting with "ii" are quite popular for Japanese nationality. [Toshichika Iizumi, Japan]	Accepted - Sentence was revised
2216	20	30	20	30	Lizumi' should be 'Iizumi' [Akihiko Ito, Japan]	Accepted - Sentence was revised
49114	20	30	20	32	This sentence is not clear, needs to be rephrased [Bill Hare, Germany]	Accepted - Sentence was revised
50572	20	30	20	30	First author's name is Iizumi (capital i), not Lizumi. [Jacob Schewe, Germany]	Accepted - Sentence was revised
53648	20	30	20	30	This sentence may be added as an example. Mohammed et al. (2017 ; doi: 10.1007/s10584-017-2073-2) showed different effects on extreme flows and water availability of Brahmpautra River under 1.5 and 2 C global warming considering high-end climate change". [AKM SAIFUL ISLAM, Bangladesh]	Rejected. Too detailed.
17302	20	31	20	31	midway is one word [David Schoeman, Australia]	Accepted - Sentence was revised
3438	20	32			It seems that the bit 'and the 2°C scenario from RCP2.6 and RCP4.5 in 2100' is not needed. The interpolated 1.5°C scenario lies between the no-change and RCP2.6 scenarios. [David Docquier, Belgium]	In this Lizumi et al 2017, RCP2.6 has a global temperature increase of +1.8°C and RCP4.5 of +2.7°C
61826	20	32	20	32	check coherency for mean warming in RCP2.6 (here given as 1.8°C) with other chapters (1, 2 and x chapter box on scenarios). [Valérie Masson-Delmotte, France]	these are the values given in the cited paper
53052	20	35	20	35	There are more model simulations than observations in assessing impacts at 1.5oC or 2oC warming? Under RCP2.6, maximum temperature over 2081-2100 relative to 1981-2000 are projected to be about 1.5 to 2oC Sillman et al. (2013). [Thian Gan, Canada]	Not applicable - this part is removed
50578	20	39	20	40	I don't see the logic why this requires expert judgment, other than the kind of expert judgment involved in any science. I recommend to either remove this sentence or be more specific. [Jacob Schewe, Germany]	Not applicable - this part is removed
15896	20	42	20	48	This paragraph appears to be focused on the spatial variability of warming. However, a number of unrelated topics are raised, including signal to noise and temporal variability, as well as phenology. It would be preferable to focus this paragraph on the main topic of the section (how risks of 1.5oC versus higher warming levels assessed). [Australia]	Not applicable - this part is removed
19326	20	42	20	48	Also for Europe, from the study by Vautard et al 2014 (http://iopscience.iop.org/article/10.1088/1748-9326/9/3/034006/meta): The European climate under a 2?°C global warming: A marked trend with an increased amplitude of up to more than 4?°C in the 20-year return value of the summer daily maximum and an even larger warming (up to more than 6?°C) over Scandinavia for extreme cold daily minima in winter. [Aristeidis Koutroulis, Greece]	Not applicable - this part is removed
35308	20	42	20	42	... a global average of the daily temperature. --> daily AIR SURFACE temperature [Ana Bastos, France]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
50580	20	42	20	48	I find this paragraph somewhat confusing. The two points I take from it are that regional warming may exceed global warming - which I think has been mentioned above - and that sub-daily temperatures may change at different rates than the daily average. I think it would be good to simply state these points in a clear language, cite the relevant literature, and not start discussing signal-to-noise, significance, or other issues which would need more space to explain properly. [Jacob Schewe, Germany]	Not applicable - this part is removed
62320	20	42	20	48	This paragraph is really good [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - this part is removed
32078	20	44	20	45	The term "Spatial variations" is not clear and is incomplete. Suggestion to replace with "regional changes in other temperature metrics" [Jamaica]	Not applicable - this part is removed
36410	20	44	20	45	The term "Spatial variations" is not clear and is incomplete. Suggestion to replace with "regional changes in other temperature metrics" [Snaliah Mahal, Saint Lucia]	Not applicable - this part is removed
49116	20	44	20	45	Spatial variations is not clear and incomplete, consider replacing by "regional changes in other temperature metrics" [Bill Hare, Germany]	Not applicable - This section was rewritten
35310	20	48	20	48	Should read: Piao et al., 2015a. Also worth adding Peng et al. 2013 (doi:10.1038/nature12434) [Ana Bastos, France]	Not applicable - This section was rewritten
39624	20	48	20	48	Add the letter "a" after "2015" in "Piao et al., 2015" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
3440	21	1	21	19	This paragraph is very important but I would separate it into 2 parts, the first one ending with L6 ('Section 3.2.3)') and the second one starting with 'Another major challenge'. The two parts are linked, but they provide two slightly different ideas (downscaling uncertainties on the one hand, and propagation uncertainties on the other hand). [David Docquier, Belgium]	done
9182	21	1			As a courtesy for the authors, I provided a long (but obviously not exhaustive) list of minor corrections thorugh some examples. For instance here please change "i.e" to "i.e." [Marco Turco, Spain]	Not applicable - This section was rewritten
10398	21	1	21	19	most of this paragraph still deals with challenges at the climate model side but should be about the impact model side [Christopher Reyer, Germany]	It should be for both climate and impact models; impacts model considerations have been added
15898	21	1	40	34	In Section 3.3 the section headings (e.g. 3.3.1.2, 3.3.2.2 and 3.3.3.2) and some of the figures (e.g. Figures 3.7 and 3.9) suggest great emphasis on differences between projections for 1.5oC and 2oC of global warming. While these differences are important, the projected changes between now and 1.5oC of global warming themselves are key, and this is often reflected in the text (e.g. on p31). It is unclear why some of the section headings and figures suggest otherwise. [Australia]	Rejected. The differences between climate at 1.5°C and 2°C global is a main focus of the report.
15900	21	1	40	34	In Section 3.3 there seems to be an excessive amount of content on historical observed changes that the text does not strongly link to inferences on future changes under 1.5oC of global warming. Unless the text can make these links stronger, this text would seem to be out of scope and can probably be removed. Much of the content is summarised in previous IPCC reports in any case. [Australia]	Accepted. Text on "hiatus" period was moved to the Annex.
15902	21	1	40	34	In Section 3.3, the figure showing differences between projected changes for 1.5oC and 2oC (e.g. Figure 3.10, p33) show 2C change minus 1.5C change. This frames the discussion in terms of "how much additional change would 2oC global warming produce". Consideration could be given to showing 1.5oC change minus 2oC change instead, which would frame the discussion in terms "how much change would be avoided if global warming was limited to 1.5oC rather than 2oC" and better support the discussion in Secton 3.5. [Australia]	Rejected. Does not seem to be more useful information. Would also mask the fact that substantial changes occur at 1.5°C global warming, and that this level of warming can thus not be considered fully safe either.
15904	21	1	40	34	It is difficult to see the relevance of much of the contect of Section 3.3 because of the structure. Each climate variable is discussed in terms of observed changes, inferences from observations on the effects of a further 0.5oC of global warming (where available) and projections. Each of these has a global and regional aspect. The section might be more readable if all aspects for a given climate variable were kept together. For example, all aspects (including global changes) of mean temperature discussed before moving onto extreme temperature. [Australia]	Noted. We have shortened the global section and moved most of the material on temperature and precipitation to the respective subsections on these variables.
60352	21	1	48	43	The structure of the text in sections 3.3.1- 3.3.4 focuses on (1) global change, (2) temperature, (3) precipitation, and (4) drought. But dedicating 20 pages to discuss nuances between the "observed and attributed" and "projected" changes in each of the topics loses the reader. Since many of the results depend on AR5, summarizing those results first in the context of the four topics then describing new results would convey the points much better. In addition there are many of the same references (e.g., Seneveratne) that start the description of each section. Consider consolidating to reduce to 3-4 pages. There are nuggets of good information that get lost in sheer repetitiveness. The reference to regions also seems random. Explain upfront what regions you will be focussing on and why – talking about all regions randomly depending on the paper being referenced and discussed is not needed. [United States of America]	Noted. Text has been shortened. Redundancies have been removed. We have tried to avoid repetition of references.
12824	21	3			… on 1.5°C and 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
44920	21	6	21	6	see section 3.2.3': Section 3.2.3 is summary. Is this OK? [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
10400	21	11	21	11	also cite Frieler K, S Lange, F Piontek, CPO Reyer, J Schewe, L Warszawski, F Zhao, L Chini, S Denvil, K Emanuel, T Geiger, K Halladay, G Hurtt, M Mengel, D Murakami, S Ostberg, A Popp, R Riva, M Stevanovic, T Suzuki, J Volkholz, E Burke, P Ciais, K Ebi, TD Eddy, J Elliott, E Galbraith, SN Gosling, F Hattermann, T Hickler, J Hinkel, C Hof, V Huber, J Jägermeyr, V Krysanova, R Marcé, H Müller Schmied, I Mouratiadou, D Pierson, DP Tittensor, R Vautard, M van Vliet, MF Biber, RA Betts, B Bodirsky, D Deryng, S Frolking, CD Jones, HK Lotze, H Lotze-Campen, R Sahapal, K Thonicke, H Tian, Y Yamagata (2017) Assessing the impacts of 1.5°C global warming - simulation protocol of the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP2b). Geoscientific Model Development. 10, 4321–4345 doi.org/10.5194/gmd-10-4321-2017 which is the latest ISIMIP protocol paper focussing on 1.% vs 2°C impacts [Christopher Reyer, Germany]	done
6484	21	14	21	14	frameworks being' should be 'frameworks are being' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
17304	21	14	21	14	Insert "are" between "frameworks" and "being" [David Schoeman, Australia]	Not applicable - This section was rewritten
60354	21	14	21	14	Include "are" in "frameworks are being adopted" [United States of America]	Not applicable - This section was rewritten
50582	21	17	21	18	What does "is already an issue" mean? That it is being applied, or that it is a problem? [Jacob Schewe, Germany]	right (second option)! But this part is removed
61830	21	17	21	19	It is already an issue for the physical systems. Please reformulate. Physical systems do not have issues. [Valérie Masson-Delmotte, France]	This part is removed
5580	21	18	21	18	I guess that all the citations of the references…. (Rougier and Goldstein, 2014; Tran et al., 2016; Williamson and Goldstein, 2012).… should be in chronological order…from the oldest to the newest…please check in the entire document the right order of the citations. [Sandra CASSOTTA, Denmark]	Not applicable - This section was rewritten
41522	21	18	21	18	not for biological system [Sergio Aquino, Canada]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6046	21	19	21	19	Another method that I don't see mentioned explicitly here, would be to extract information from model-based impact studies that have undertaken systematic sensitivity analysis with respect to climate. This can offer estimates of impacts per unit of climate change (e.g. per degC or per 10% precipitation change), with other factors fixed. Realism may be limited, but attribution of simulated impacts easier. Impact response surfaces have been presented in recent years showing these types of analysis (though not explicitly to study 1.5 degC global warming) and the approach could be cited here. Of course, local sensitivity studies would then need to be matched to regional projections under 1.5 degC or 2 degC global warming (e.g. using pattern scaling or information from a Figure such as Figure 1.3, for observed, combined with an equivalent multi-model ensemble climate projection figure in Box 3.2), These examples are for Europe, where regional temperature change exceeds the GMAT change, so the part of the response surface to look at might be around 2-3 degC or even higher. Maybe an analysis for AR6, but work has started on this in different sectors, see for example: Fronzek et al., 2011. Evaluating sources of uncertainty in modelling the impact of probabilistic climate change on sub-arctic palsa mires. Nat. Hazards Earth Syst. Sci. 11, 2981–2995. http://dx.doi.org/10.5194/nhess-11-2981-2011; Prudhomme et al. 2013a. Climate change and river flooding: part 1 classifying the sensitivity of British catchments. Clim. Chang. 119, 933–948. http://dx.doi.org/10.1007/s10584-013-0748-x.; Prudhomme et al. 2013b. Climate change and river flooding: part 2 sensitivity characterisation for British catchments and example vulnerability assessments. Clim. Chang. 119, 949–964. http://dx.doi.org/10.1007/s10584-013-0726-3; Pirttioja et al., 2015. A crop model ensemble analysis of temperature and precipitation effects on wheat yield across a European transect using impact response surfaces. Climate Research, 65, 87-105; doi: 10.3354/cr01322 - here look at Fig 8. Recent work has looked at model responses over large sub-continental regions and for multiple sectors, but currently in review. [Timothy Carter, Finland]	this suggestion has been taken into account in the paragraph dealing with uncertainties in SI
10402	21	22	21	38	this summary mostly summarizes section 3.2.1 and not 3.2.2 [Christopher Reyer, Germany]	Noted. The summary was removed because of space limitations.
38680	21	22	21	38	Check for consistency across the SR that these three cases are explained in similar terms and same order. [Jan Fuglestvedt, Norway]	Noted. Will need to be double checked with final versions of other chapters. May be relevant for SPM.
62322	21	24	21	38	This summury is really good [JACQUES-ANDRE NDIONE, Senegal]	Noted. The summary was removed because of space limitations. May be included again prior to publication if deemed necessary.
270	21	29	21	30	Have trouble grasping the usefulness of (d) possibility. When talking about the uncertainty of data millenia into the future, does this justify any discussion whatsoever?? [Paul Doyle, Canada]	Rejected. Possibility (d) is important for the assessment of committed climate change, e.g. the long-term disparition of small-island states because of sea level rise.
41524	21	31	21	31	extra space before Data…. [Sergio Aquino, Canada]	Not applicable - This section was rewritten
15906	21	33	21	33	Replace "data" with "model outputs"or "analyses". Model projections are not data. [Australia]	Not applicable. This section was removed due to space constraints.
5582	21	37	21	38	the authors mention the lag…but I think they should include in the text the concept of predictability, unpredictability, autocorrelation (negative and positive) as these concepts are linking the time lag of the events [Sandra CASSOTTA, Denmark]	Rejected. Lag is used here in a general sense, these additions would be too detailed.
7290	21	37	27	37	Re: lag effects for snow melt - this can be misleading. There will not be a lag effect for seasonal snowpack, only for permanent snow. Suggest making this clearer. (also other parts of this chapter) [Chantal Donnelly, Australia]	Rejected. Too detailed.
17820	21	41	21	41	The removal of "associated hazard" in the title of section 3.3 would be good. Although there are a number of description about the hazards, however, it is not appropriate to mention in the section title. [Republic of Korea]	Rejected. "Hazard" is a well established term in the context of risk assessments (terminology introduced in the IPCC SREX report and also further discussed in the IPCC AR5 WG2 report).
17822	21	41	21	41	I think the section structure of 3.3 should be re-organized. Section 3.3.1 provides an overview on changes in global climate with a focus on global patterns of temperature and precipitation. Sections 3.3.2-3.3.11 provide assessments for specific aspects of the climate system. However, the content in section 3.3.1 is duplicated with that in some sections of 3.3.2-3.3.11, therefore, the authors may want to also provide a new section which provides an overview on changes in regional climate. And then, the authors may want to provide assessments for specific aspect of the climate system. Furthermore, some topics in sections of 3.3.2-3.3.11 do not correspond to the climate system. For example, the scope of section 3.3.5 (runoff and river flooding) are not matched with that of section 3.3.8 (ocean circulation and temperature). [Republic of Korea]	Noted. Not all suggested changes seemed pertinent. But Section 3.3.1 has been very substantially shortened. Other proposed changes (e.g. section on regional changes) would be too complex to implement and would lead to too much redundancy, in particular given space limitations.
57624	21	41			This section is very long with detailed specialized information. The whole chapter has 60 pages assigned, the authors will need to make sure there is a balance to reflect the information in scoped content – in the scoped content the climatic changes are all set in the context of impacts, risks and adaptation, and this is lost here. I suggest the authors build from SREX but not repeat SREX material and present information in a condensed summary form eg using tables (see SREX Table 3.1). It is tempting to present all information in detail, this should be an integrated chapter with policy-relevant messages [Hans Poertner, Germany]	The text was substantially shortened, some material was moved to the Annex.
57626	21	41	21	41	Why isn't hazard defined in Box 3.1? [Hans Poertner, Germany]	Hazard is a well established concept from prior IPCC reports (e.g. IPCC SREX, IPCC AR5 WG2), not necessary to introduce it again given space constraints.
62308	21	41	67	38	I'd like to suggest add a case of damage by strong hail and extreme drought which occurred in temperate coniferous forest in Korea in 2017 as a' Box3.x'. [Go Eun Park, Republic of Korea]	Rejected. Too detailed.
15908	21	43	21	47	The title of Section 3.3 refers to hazards as well as changes in climate but this paragraph, and the rest of the section, only discusses temperature and precipitation means and extremes. The section does not, therefore, contain a comprehensive discussion of hazards. [Australia]	Noted. It might be useful to add a sentence on hazards prior to publication, in coordination with SPM and glossary. But as indicated in other answers, "hazard" is well established as concept from prior IPCC reports (IPCC SREX, IPCC AR5 WG2).
3442	21	46			Delete ', including … extremes'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
41526	21	47	21	47	in Section 3.3.12. [Sergio Aquino, Canada]	Accepted - Punctuation was edited
21762	21	49	22	13	I find this entire paragraph repetitive. Please consider deletion. [LUIS VALDES, Spain]	Rejected. Was kept because it indicates was are broad resources underlying the assessment, both from past IPCC reports as well as from several new publications (list expanded for the latter).
53442	21	49	21	49	WG1 should be written as WGI [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication
53560	21	49	21	49	WG1 should be written as WGI [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication
3444	22	2			Delete 'as'. [David Docquier, Belgium]	Not applicable - This sentence was rewritten
19330	22	3			Jacob et al. missing year [Aristeidis Koutroulis, Greece]	Accepted - Reference was edited
3446	22	5			Delete the sentence 'Backgroung … Section 3.2'. [David Docquier, Belgium]	The sentence is still there, only revised

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7292	22	5	22	12	FYI (regarding using RCP8.5 for the 1.5C ensemble) Donnelly et al. 2017 compared ensemble precipitation projections using transient time slice methods first with an ensemble made up of RCP2.6 and 4.5 and second with an ensemble made up of RCP8.5. This was done to determine whether the projected impacts at 2C were dependent on the choice of RCP used to drive the ensemble for a particular warming threshold. [Chantal Donnelly, Australia]	Not applicable - This text was deleted
19328	22	5	22	7	It is stated, "The main assessment on projections build on the transient evaluation of climate at 1.5°C vs 2°C global warming based on global climate model simulations driven with the RCP8.5 scenario (see Section 3.2.)". I cannot see any information in Section 3.2 leading to this conclusion. Is there any table including information on number of studies per RCP? [Aristeidis Koutroulis, Greece]	Not applicable - This text was deleted
3448	22	6			Replace 'build' by 'builds'. [David Docquier, Belgium]	Not applicable - This text was deleted
50966	22	6	22	6	assessment on projections build ==> builds [Fatima Driouech, Morocco]	Not applicable - This text was deleted
1354	22	7			Scenario RCP8.5 is supposedly described in section 8.2. It is not. Nor are there any scenarios described [Karen Olsen, Denmark]	Not applicable - This text was deleted
6170	22	7			Scenario RCP8.5 is supposedly described in section 8.2. It is not. Nor are there any scenarios described [Anne Olhoff, Denmark]	Not applicable - This text was deleted
18260	22	7			Scenario RCP8.5 is supposedly described in section 8.2. It is not. Nor are there any scenarios described [Andrea TILCHE, Belgium]	Not applicable - This text was deleted
44922	22	7	22	7	see Section 3.2. --> Specify subsection number. [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
3450	22	8			Replace 'as' by 'at'. [David Docquier, Belgium]	Not applicable - This text was deleted
1788	22	10	22	10	What is meant by 'approximately consistent'? [Greece]	Not applicable - This text was deleted
44924	22	10	22	10	see Section 3.2. --> Specify subsection number. [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
61832	22	10	22	12	I could not find the elments showing different results for precipitation in section 3.2 (references, examples). This is needed in this chapter. Too much repetion in this whole paragraph with earlier sections. [Valérie Masson-Delmotte, France]	Not applicable - This text was deleted
15910	22	11	22	12	Addition of text stating how the report addresses differences in results for 1.5oC from RCP8.5 and from other emissions scenarios would be helpful. [Australia]	Not applicable - This text was deleted
5584	22	12	22	12	mean precipitation is a vague term…may be specify that it is meant for a specific month or period. [Sandra CASSOTTA, Denmark]	Not applicable - This text was deleted
15912	22	12	22	13	It is not obvious how the changes in hazards for 0.5oC are relevant to this report on 1.5oC. Another sentence or two might be necessary to explain this. [Australia]	Not applicable - This text was deleted. Note that the background on the use of changes in hazards for 0.5°C warming in the observed record is provided in section 3.2
1356	22	16			The chapter is on impacts. That's where the focus has to be. Description of the science of climate change need to be minimized. I wonder why there is no separate chapter describing there relevant parts. Section can be reduced by 75% [Karen Olsen, Denmark]	Rejected. This is a wrong interpretation of the mandate of this chapter. This chapter is covering both WG1 and WG2 material, hence changes in climate need to be covered, in order to robustly assess changes in impacts. Nonetheless, text was shortened in this section due to space limitations.
3510	22	16	27	6	I am not convinced that there should be a separate Section 3.3.1 on global climate changes since it only focusses on temperature and precipitation, which are discussed in Sections 3.3.2 and 3.3.3 respectively. Section 3.3.1 does not only focus on global changes but also on regional changes through the different maps shown. My suggestion is to merge the temperature paragraphs of Section 3.3.1 with Section 3.3.2, and the precipitation paragraphs of Section 3.3.1 with Section 3.3.3. Thus, there would be a section dedicated to changes in temperature (both global and regional), and a section related to precipitation (both global an regional). [David Docquier, Belgium]	Noted. This section has been now very substantially shortened.
6172	22	16			The chapter is on impacts. That's where the focus has to be. Description of the science of climate change need to be minimized. I wonder why there is no separate chapter describing there relevant parts. Section can be reduced by 75% [Anne Olhoff, Denmark]	Rejected. This is a wrong interpretation of the mandate of this chapter. This chapter is covering both WG1 and WG2 material, hence changes in climate need to be covered, in order to robustly assess changes in impacts. Nonetheless, text was shortened in this section due to space limitations.
18262	22	16			The chapter is on impacts. That's where the focus has to be. Description of the science of climate change need to be minimized. I wonder why there is no separate chapter describing there relevant parts. Section can be reduced by 75% [Andrea TILCHE, Belgium]	Rejected. This is a wrong interpretation of the mandate of this chapter. This chapter is covering both WG1 and WG2 material, hence changes in climate need to be covered, in order to robustly assess changes in impacts. Nonetheless, text was shortened in this section due to space limitations.
57698	22	16	68	37	While an excellent disciplinary compilation of climate physics phenomena the further integration of WGI and WGII information would at the same time identify disciplinary information to be moved to online supplementary material without harming the policy relevant messages. This would bring relevant information on impacts further upfront, help identify key impacts and risks and enhance readability for stakeholders. [Hans Poertner, Germany]	Noted. This section has been now very substantially shortened.
17308	22	18	24	20	This section talks about observed and projected changes, buit doesn't really get into attribution in any detail. [David Schoeman, Australia]	Noted. Attribution is mentioned in Section 3.2 and some material is provided in the Annex. If it is considered critical, some text to be brought up again in the main document prior to publication.
21764	22	19		21	Repetitive. Consider deletion [LUIS VALDES, Spain]	Done. Text was substantially shortened and condensed. This specific sentence is no longer included.
61836	22	19	23	23	Too long, lack of focus, not an exhaustive assessment (e.g. literature / hiatus). [Valérie Masson-Delmotte, France]	Noted. Text on hiatus has been removed, all of the text has been substantially shortened.
17310	22	23	22	23	Is this sentence true for a year, or for a multi-decadal average, as per definitions? [David Schoeman, Australia]	Noted. Text was revised and the FGD now provides 2 numbers in coordination with chapter 1: The average warming over the decade 2006-2015 and the attributed human-induced warming in the year 2017.
21766	22	23			• "The Global Mean Surface Temperature (GMST) warming has reached 1°C above pre-industrial levels at the 24 time of writing" I think it is useful to add " meaning that a substantial part of land mass is already in the range of 1.5-2ºC above the pre-industrial levels." [LUIS VALDES, Spain]	Not applicable. Referred sentence has been substantially revised.
29408	22	23	22	32	Please make out if GMST is derived from "air temperature over the ocean" or from "ocean water temperature". [Joan A. Lopez-Bustins, Spain]	Rejected. Depends on analysis. Specifics are addressed in chapter 1.
41528	22	23	22	24	delete: delete: at the time of writing [Sergio Aquino, Canada]	Not applicable - This section was rewritten
61834	22	23	22	32	repeated from chapter 1 without quoting the exact corresponding section [Valérie Masson-Delmotte, France]	Noted. Has not yet been fixed. Reference to specific section could be added prior to publication.

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3452	22	24	22	32	Not needed. What is interesting is the warming as of today, not as of AR5. Only the first sentence of this paragraph is really necessary. [David Docquier, Belgium]	Rejected. Need both information on present conditions and a reference to AR5 assessment (which underlay the preparation of the Paris agreement).
15914	22	24	22	26	It is not clear that the sentence on Hartmann et al. (2013) is meant to back up the previous sentence or introduce new information. This is because it is not clear whether 1880 is taken as pre-industrial, whether GMST and globally averaged land and ocean surface temperature at the same quantity and because the Hartmann range allows for the possibility of warming less than 1oC. [Australia]	Not applicable anymore. Text has been substantially revised. Context for AR5 reference has been precised.
15916	22	25	22	25	The text "for time frames up to 2012" seems unnecessary. [Australia]	Not applicable - This section was rewritten
53054	22	25	22	25	Given the nonlinear trend of warming, 0.85oC over 1880-2012 compared to 0.72oC over 1951-2012, I am not sure if a linear trend approach should be used? [Thian Gan, Canada]	Not applicable. This text has been removed.
15918	22	26	22	26	over the period not "above" [Australia]	Noted. Text has been revised ("for the period 1880-2012")
15920	22	26	22	26	Should read "warming of 0.85 [0.65 to 1.06]°C during [or "over"] the period 1880–2012" [Australia]	Noted. Text has been revised ("for the period 1880-2012")
40196	22	26	22	27	the statement (see also Annex 3.1 to this section for more details) is better to be more specify (see also Annex 3.1 , SI_S3-3_Supplementary information to Section 3.3), and this is missed in the table of contents in Annex 3.1,it must be in the table of contents added after (SI_S3-2_ Supplementary information to Section 3.2) to be SI_S3-3_------ page 7 [Amal Hussein, Egypt]	Accepted. Now noted specific section.
15922	22	30	22	30	It is not clear what "sensibly" means in this context. [Australia]	Accepted - sentence was rewritten
56276	22	30	22	30	Change "estimate" to "estimated". [Annika Herbert, Australia]	Not applicable - This section was rewritten
32812	22	32			I feel this paragraph really has to point out that the model results are for surface air temperature and fully global, and that's not what's used in chapter 1. I don't expect everything to be redone, but I think the implication needs to be made clear, namely that 1.5C for SAT in a climate model with full spatial coverage is equivalent to about 1.3C (based on ch 1) were the limited spatial coverage of historical observations and SSTs rather than air temperatures over the oceans to be used. This means all the impacts reported here are for lower levels of warming that what would be realized when ch 1's definition of 1.5C were to be reached. The definition used here when the models are analyzed is in principle fine, but as it's not what's used in chapter 1 that needs to be stated explicitly in my opinion. [Drew SHINDELL, United States of America]	Rejected. This is too detailed and would belong in chapter 1. May need to be considered in coordination with chapter 1 (possible note to be included prior to publication).
39626	22	35	22	35	Replace "global mean surface temperature" by "GMST", because it was already defined in the previous paragraph. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
19332	22	39			Add a (before Seneviratne [Aristeidis Koutroulis, Greece]	Not applicable - This section was rewritten
7788	22	40	22	48	Especially line 45, would recommend not using "incorrectly", since we would expect periods of higher and lower temperatures within trends that are generally upward. The period 1947-1977 (or there abouts) could also be termed such, but it does not cast any doubt or aspersion that temperatures since 1880 are generally up. [Anthony Lupo, United States of America]	Not applicable. This paragraph has been removed due to space limitations.
49862	22	40	22	41	Here, you could add stg on 2017 as well [Erik Kjellström, Sweden]	Not applicable. This paragraph has been removed due to space limitations.
30444	22	43	22	44	The term decoupled is not adequate in this context. We suggest to replace "global temperature response" by "global temperature interannual variation" [France]	Not applicable - This section was rewritten
15924	22	44	22	45	Is "cooler global temperatures" correct? It is not clear what the temperatures are cooler relative to. Should this read "the slow down in GMST warming"? [Australia]	Not applicable. This paragraph has been removed due to space limitations.
15926	22	45	22	45	Is it necessary / justified to refer to the hiatus period as incorrectly labelled? The text does not specifically say that there was no Actual hiatus in GMST warming and this statement does not seem to be justified by the text. [Australia]	Not applicable. This paragraph has been removed due to space limitations.
15928	22	45	22	47	There is an assumption here that because warming can temporarily proceed at slower rates than would be expected given radiative forcing then it can also temporarily proceed at faster rates. This needs more justification. [Australia]	Not applicable. This paragraph has been removed due to space limitations.
29340	23		23		Figure 3.3 the legend are hard to read (have a bad quality). [Borbala Galos, Hungary]	Not applicable - This figure was deleted
54362	23	1	23	1	See very recent publication of Huang et al. (2018, Nature climate change) on the role of arctic temperatures [Robert Vautard, France]	Not applicable - This figure was deleted
29410	23	2	23	2	A space is missing between "3.2" and "on". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
39628	23	2	23	2	Insert space in "Box 3.2on". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
50814	23	2	23	2	..Box 3.2 on.. instead of "..Box 3.2on.." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
56756	23	2	23	2	Missed a space after "Box 3.2"… [Xiaolin Zhang, China]	Not applicable - This section was rewritten
15930	23	3	24	4	This statement requires more justification. For example, is it assumed that internal climate variability is on shorter time scales than human-induced warming? Is it assumed that there is no significant natural long-term warming signal on the time scales of warming to 1.5C? In terms of risks of impacts and tipping points in the climate system, does is matter whether a 1.5C threshold in human-induced warming is reached or whether a 1.5C threshold in "total" temperature difference (all forced signals and unforced variability) is reached? Note that the following sentences are relevant here, but possibly need to appear before this one. [Australia]	Not applicable. This question is addressed in Chapter 1. Also for impacts, it is attributable warming that is relevant.
3454	23	6	23	13	This paragraph has nothing to do here. [David Docquier, Belgium]	Rejected. Attribution is also highly relevant to the chapter 3 assessment. Text has been, however, shortened and substantially revised.
56616	23	6	23	13	it would be useful here to referre to recent work (or chapter 1) where the attributable global warming is discussed also with respect to different estimates of GMst trends. E.g. https://www.nature.com/articles/s41598-017-14828-5 [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Too detailed for this section. This specific topic belongs in Chapter 1. In addition, this reference is also mention in the cross-chapter box on 1.5°C warmer worlds.
46666	23	7	23	11	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - This section was rewritten. Throughout Section 3.3.1. IPCC language has been used according to IPCC guidance document.
15932	23	9	23	9	It would be helpful to state the amount of warming between 1951 and 2010. [Australia]	Not applicable - Text has been substantially revised.
15934	23	10	23	13	This sentence does not seem to be relevant in this discussion, which seems to relate to how we are progressing towards 1.5C GMST warming and what the causes are. [Australia]	Not applicable - Text has been substantially revised.
53056	23	13	23	13	See Sillman et al. (2013). [Thian Gan, Canada]	Sillmann et al is not added
15936	23	15	23	34	It should be noted that the extremes commented on are not "threshold" extremes (e.g. annual number of days > 35C) [Australia]	Not applicable - Text has been substantially revised. Providing this type of information would be too detailed.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35046	23	15	23	34	More recent literature can be cited in this section: the increases in mean temperature and temperature extremes over China are greater than that in global mean temperature. With respect to 1986–2005, the temperature of hottest day (TXx) and coldest night (TNn) are projected to increase about 1/1.6 °C and 1.1/1.8 °C, whereas warm days (TX90p) and warm spell duration (WSDI) will increase about 7.5/13.8% and 15/30 d for the 1.5/2 °C global warming target, respectively. References: SHI Chen , JIANG Zhi-Hong, CHEN Wei-Lin , Laurent LI (2017). Changes in temperature extremes over China under 1.5 ?C and 2 ?C global warming targets. Advances in Climate Change Research, 1-10. [Shaukat Ali, Pakistan]	Rejected. We focused on global studies in the assessment, especially for temperatures since signal is found worldwide.
506	23	16	23	16	A typo: "global warming of of 0.5" should be "global warming of 0.5" [Taoyuan Wei, Norway]	Accepted - Text was revised with the suggested edit
9184	23	16			Please change "of of" to "of" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10678	23	16	23	16	Change to 'global warming of 0.5°C, …' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
19334	23	16			remove dublicate (of) [Aristeidis Koutroulis, Greece]	Accepted - Text was revised with the suggested edit
29412	23	16	23	16	Please delete the second "of". [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised with the suggested edit
39630	23	16	23	16	Delete "of" (it is repeated). [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
40198	23	16	23	16	the word "of" is repeated, delete one of them [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
49424	23	16	23	16	delete one 'of' [Alexander Chernokulsky, Russian Federation]	Accepted - Text was revised with the suggested edit
54364	23	16	23	16	repetition of "of" [Robert Vautard, France]	Accepted - Text was revised with the suggested edit
56278	23	16	23	16	Remove duplicate "to". [Annika Herbert, Australia]	Unclear what this comments refers to, the duplicate "of" was deleted
56754	23	16	23	16	delete "of" after warming: global warming of… [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
60356	23	16	23	16	Remove extraneous "of" [United States of America]	Accepted - Text was revised with the suggested edit
30994	23	17	23	19	I don't think it even accounts for linearity e.g. the spatial pattern of sea-ice change from 0.0 to 0.5 degC warmimg will be quite different to that from 1.5 to 2.0 degC waming. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Spatial pattern of sea-ice change would be different for these comparisons due to 1) threshold effects and 2) added temporal dependence. These are both leading to non-linear dependences on global temperature, which is referred to here. Note that this text was removed due to space constraints, but the approach is presented in Section 3.2.
53058	23	18	23	18	I would think that tipping points should be basically regional instead of global given the high spatial variability of climate variables? Conversely, I don't think we have quite reached the global tipping point yet? [Thian Gan, Canada]	Not applicable - This text was deleted.
40200	23	19	23	19	It will more easy for the reader to add beside the statement (see Box 3.5 on tipping points) that it is page 67 to be for example (see Box 3.5 on tipping points, p 67) [Amal Hussein, Egypt]	Not applicable - This text was deleted
3456	23	21			Rephrase: 'Schleussner et al. (2017) used this approach and assessed…' [David Docquier, Belgium]	Accepted - The sentence was revised
50816	23	23	23	23	describe once what GISTEMP? [Amjad Masood, Pakistan]	Accepted - Acronym was spelled out
53060	23	25	23	25	What is the definition of WSDI? Is WSDI the warm spell duration index which are annual counts of at least six consecutive days with Tmax greater than the historical 90th percentile value? [Thian Gan, Canada]	Not applicable - This section was rewritten. WSDI is referred to in following section. (Yes, the definition is correct).
50818	23	29	23	29	...six days... or "...6-days.." instead of "...6 days.." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
17312	23	31	23	34	This sentece needs editing for grammar [David Schoeman, Australia]	Not applicable - This section was rewritten
39632	23	31	23	31	Because it has not been previously defined, I suggest to include the full definition of "20CR" in this way: "20th Century Reanalysis (20CR)" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
49864	23	32	23	32	Can you be a bit more precise here "to be considered with caution" - what is it that you mean? The above discussion is based on observations that are also associated with uncertainties that also needs to be handled with "caution". [Erik Kjellström, Sweden]	Not applicable - This section was mostly removed.
508	23	35	23	35	The text in the figure is too difficult to read. [Taoyuan Wei, Norway]	Not applicable - This figure was deleted
15938	23	35	23	36	Quality of Figure 3.3 is very poor. Legends and labels are not legible [Australia]	Not applicable - This figure was deleted
28216	23	35	23	35	Parts of the figure 3.3 are unreadable. [Germany]	Not applicable - This figure was deleted
30446	23	35	23	42	Figure 3.3 : The poor quality of the Figure does not allow to properly assess its relevance and its ability to support the related messages [France]	Not applicable - This figure was deleted
39634	23	35	23	35	The legend in the Figure 3.3 (right side) is not legible. [Hernan Edgardo Sala, Argentina]	Not applicable - This figure was deleted
39960	23	35	23	36	The figure legend is not visible to read [Adi Nugraha, United States of America]	Not applicable - This figure was deleted
46892	23	35	23	42	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Not applicable - This figure was deleted
49952	23	35	23	37	Figure 3.3 should be clearer [Perdinan Perdinan, Indonesia]	Not applicable - This figure was deleted
53062	23	35	23	36	The legends of Figure 3.3 are not readable [Thian Gan, Canada]	Not applicable - This figure was deleted
54688	23	35	23	36	Fig titles and legends not visible [Qudsia Zafar, Pakistan]	Not applicable - This figure was deleted
3460	23	36			Figure 3.3: The quality is poor. I would enhance the resolution, as well as the label sizes. [David Docquier, Belgium]	Not applicable - This figure was deleted, and results are not referred to in detail.
3458	23	38			Typo: 'globally'. [David Docquier, Belgium]	Not applicable - This figure was deleted
17314	23	38	23	38	Replace "globall3.y" with "globally". [David Schoeman, Australia]	Not applicable - This figure was deleted
19336	23	38			Change globall3.y to globally [Aristeidis Koutroulis, Greece]	Not applicable - This figure was deleted
29342	23	38	23	38	There is a typo (globally) [Borbala Galos, Hungary]	Not applicable - This figure was deleted
32464	23	38	23	38	spelling: change "globall3.y" to "globally" [Rosanne Martyr-Koller, Germany]	Not applicable - This figure was deleted
39636	23	38	23	38	There is a typo in "globall3.y". [Hernan Edgardo Sala, Argentina]	Not applicable - This figure was deleted
44926	23	38	23	38	globall3.y-->globally? [Hiroaki Kondo, Japan]	Not applicable - This figure was deleted
50820	23	38	23	38	is "...globall3.y..."...globally..."? [Amjad Masood, Pakistan]	Not applicable - This figure was deleted
56750	23	38	23	38	globally insteand of "globall3.y"? [Xiaolin Zhang, China]	Not applicable - This figure was deleted
60358	23	38	23	38	typo in "globally" [United States of America]	Not applicable - This figure was deleted
62324	23	38	23	38	Instead of writing "Probability density functions show the globall3.y aggregated land fraction that experienced", please write "Probability density functions show the globally aggregated land fraction that experienced" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This figure was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53064	23	42	23	42	From Figure 3.3, it seems that cold extremes had increased much more than hot extreme. It is unclear how internal variability was estimated. [Thian Gan, Canada]	Not applicable - This figure was deleted, and results are not referred to in detail.
50968	24		24		In Fig. 3.4, 3.5, 3.6, 3.10 and Boxe 3.2, hatching highlights areas where there is a certain agreement, It would be better using dots as for the AR5 (hatching was used in case of few or no agreement) [Fatima Driouech, Morocco]	Noted (note that comment was wrongly assigned to Fig. 3.3 instead of Fig. 3.4). Hatching is common to indicate agreement. However, replacement of hatching with dots could be considered prior to publication if this seems highly important for communication.
15940	24	1	24	18	The treatment of observed and attributed changes in precipitation here seems confused and unbalanced. It should start with the key findings from AR5. Also provide a theoretical framework for increased mean and extreme rainfall in a warmer world, e.g. Held and Soden (2006) and many other key papers. The first paragraph could summarise observed global and regional changes in the mean precipitation and the second could address changes in extremes. There should also be more reference to Figure 3.6. [Australia]	Not applicable - This section was rewritten. Note that because of space constraints, text could only be short. Attribution is addressed briefly but not in detail.
49866	24	1	24	9	Are there really not any more recent studies after AR5? [Erik Kjellström, Sweden]	This figure is no longer included. But the assessment based on Schleussner et al. (2017) is still discussed briefly. Regarding observed changes for a global warming of 0.5°C, we are not aware of other global studies on this topic.
15942	24	3	24	4	Presumably this sentence refers to trends in land regions with adequate precipitation observations. Specify this to contrast with the following point about spatially complete land data. [Australia]	Not applicable - This section was rewritten. More regional detail is provided. Note that details cannot be provided because of space constraints.
15944	24	3	24	4	Rephrase. Does this mean that some regional precipitation trends are significant relative to variability? [Australia]	Not applicable - This section was rewritten.
15946	24	3	24	4	This sentence "Some regional precipitation…" does not make sense. [Australia]	Not applicable - This section was rewritten
15948	24	3	24	4	What time period do are these trends cover? [Australia]	Accepted. More information has been provided.
50652	24	3	24	4	Repetition of precipitation" in sentence" [Jagdish KRISHNASWAMY, India]	Not applicable - This section was rewritten
56280	24	3	24	4	Remove "with respect to precipitation", or rephrase entirely. [Annika Herbert, Australia]	Not applicable - This section was rewritten
15950	24	4	24	9	The implication of these changes for warming of 1.5C needs to be made clearer. Otherwise the content appears to be irrelevant. [Australia]	Rejected. Relevance of attribution is addressed in Section 3.2 (and in 1st annex).
29414	24	4	24	4	Some word/s is/are missing in this sentence: "respect to ¿global? precipitation". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
15952	24	5	24	6	Clarify. Does "little change since 1900" mean no long-term trend since 1900 or little variability on any time scales between 1900 and the present? [Australia]	Not applicable - Text was substantially shortened and sentence is no longer included.
15954	24	11	24	18	It is not clear how or why the changes in precipitation have been compared with the changes in temperature. It may make more sense to compare the precipitation changes arising from the targetted 0.5C warming analysis with the more general description of observed precipitation changes in the previous paragraph. [Australia]	Not applicable - Text was substantially shortened and sentence is no longer included. These results are now discussed in section 3.3.3, consistent with the suggestion from the reviewer.
32080	24	11	24	18	Adding a corresponding figure would illustrate the results more clearly [Jamaica]	Not applicable - Text was substantially shortened and sentence is no longer included. Figure is available in the Annex.
36412	24	11	24	18	Adding a corresponding figure would illustrate the results more clearly [Snaliah Mahal, Saint Lucia]	Not applicable - Text was substantially shortened and sentence is no longer included. Figure is available in the Annex.
49118	24	11	24	18	Adding the corresponding figure would illustrate the results in a nice way [Bill Hare, Germany]	Not applicable - Text was substantially shortened and sentence is no longer included. Figure is available in the Annex.
29418	24	12	25	9	Scale bars in Figures 3.4 and 3.5 could be improved. Blue colour for the range 0-1.5ºC looks cooling instead of warming. [Joan A. Lopez-Bustins, Spain]	Accepted. Final figures have been revised to have only warm colours for changes above 0°C.
1360	24	21	26	20	Important information [Karen Olsen, Denmark]	Noted, thank you. Text was kept with some edits.
6176	24	21	26	20	Important information [Anne Olhoff, Denmark]	Noted, thank you. Text was kept with some edits.
15956	24	21	26	20	It might be possible to remove some of the panels in Figures 3.4 and 3.5 to save space. For example, the middle panels showing warming for 2C may not be needed. [Australia]	Rejected. A main mandate of chapter 3 is to compare changes at 1.5 vs 2°C
15958	24	21	26	20	Presumably Figures 3.4, 3.5 and 3.6 show ensemble mean changes, and, for the right hand panel, ensemble mean differences in changes. This needs to be stated in the text and figure captions, together with the number of models used in the analysis. [Australia]	Rejected, not enough space for this level of detail in the main text. But more background is provided in the Annex. Number of models used can be found in the referenced underlying publication (see Annex). Information may be added to Annex prior to publication if considered critical.
15960	24	21	26	20	The hatching in Figures 3.4 and 3.5 is not particularly informative. Hatching showing model agreement on the magnitude of the 2C-1.5C warming difference would be more useful. [Australia]	Rejected. Hatching shows agreement about substantial difference (of same sign) between changes at 1.5°C and 2°C.
18264	24	21	26	20	Insights such as this should be the core of this chapter: namely the best available scientific insights regarding how warming of 1.5°C & 2°C affect impacts. [Andrea TILCHE, Belgium]	Noted. This text was mostly kept with minor edits and shortening.
19096	24	21	26	19	It may be useful to cite the following papers that discuss future changes in temeprature extremes based on the HAPPI experiments. (1) Wehner, M. et al. Changes in extremely hot days under stabilized 1.5°C and 2.0°C global warming scenarios as simulated by the HAPPI multi-model ensemble. Earth System Dynamics, in press.(Contact: Michael Wehner, mfwehner@lbl.gov) (2) Shiogama, H. et al. Reduced inequities in extreme climate hazards with the 1.5 ºC goal of the Paris Agreement. Nature Communications, submitted. (Contact: Hideo Shiogama, shiogama.hideo@nies.go.jp) (3) Hirsch, A. L., et al. Biogeophysical impacts of land use change on climate extremes in low emission scenarios: Results from HAPPI-Land. Earth's Future, in press. (Contact: Annette Hirsch, annette.hirsch@env.ethz.ch) [HIDEO SHIOGAMA, Japan]	Not applicable. This text has been removed. When referring to the HAPPI experiment, the reference from Mitchell et al. 2018 was used. Wehner et al. 2018 and Hirsch et al. 2018 are referenced in the chapter. A reference to Shiogama et al. 2018 may be included prior to publication if considered critical for the chapter material.
35048	24	21	24	33	More recent studies can be cited under the section such as: The regional mean surface air temperature (SAT) over EA stabilizes after ~2040 at 1.4°C above the present-day levels in the 1.5°C simulations. In the 2°C simulations, a stable 2.0°C warming is seen by 2090. The annual mean SAT averaged over EA will be 1.7°C and 2.3°C above preindustrial levels by 2100 in the 1.5°C and 2°C simulations, respectively. Therefore, the regional mean SAT over EA will experience approximately 0.2°C higher warming than the global mean in both scenarios. Reference: Li, D., Zhou, T., Zou, L., Zhang, W., and Zhang, L. (2018). Extreme High-Temperature Events over East Asia in 1.5°C and 2°C Warmer Futures: Analysis of NCAR CESM Low-Warming Experiments. Geophysical Research Letters, 45. https://doi.org/10.1002/2017GL076753 [Shaukat Ali, Pakistan]	Not applicable - This section was very substantially shortened and main text on changes in temperature is provided in Section 3.3.2. Note that regional studies could generally not be cited due to space limitations.
53420	24	21	24	21	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Accepted - Acronym was edited

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53538	24	21	24	21	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Accepted - Acronym was edited
29344	24	22	24	22	What do you mean under 'local'? What is the spatial resolution of the simulation results on Fig 3.4? Local could also be understood as microclimate. [Borbala Galos, Hungary]	Accepted. Removed "local" from figure label.
3464	24	23	24	25	The definitions of TXx and TNn should go to P23 L27-28, when they are first used. [David Docquier, Belgium]	Not applicable - This section was substantially rewritten.
2254	24	25	24	30	The average climate is the same in RCP8.5 and RCP2.6, but the trends within the time periods are significantly different. See e.g. Bärring and Strandberg, 2017. Does the projected pathway to global warming targets matter? https://doi.org/10.1088/1748-9326/aa9f72 [Gustav Strandberg, Sweden]	Not applicable - This section was substantially rewritten. However, it will be considered if a reference to the mentioned study should be included in the relevant part of Section 3.2.
3468	24	27			Remove 'Seneviratne et al.' after 'ESR;'. [David Docquier, Belgium]	Not applicable - This section was rewritten
10296	24	27	24	27	There is no date for the Seneviratne et al. reference [Hungary]	Accepted - Reference was edited
14168	24	27	24	27	"Seneviratne et al." Incomplete citation. [Rongshuo Cai, China]	Accepted - Reference was edited
21768	24	27			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was edited
39638	24	27	24	27	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Accepted - Reference was edited
49120	24	27	24	30	Is this really possible to reproduce the middle and right parts of Fig. 3.4 given that the model mean of the RCP2.6 simulations does not reach +2°C? Check consistency with the last sentence of the legend of Fig. 3.4 [Bill Hare, Germany]	Rejected. The results are similar, some RCP2.6 simulations reach 2°C.
21770	24	32			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was edited
39640	24	32	24	32	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Accepted - Reference was edited
49122	24	32			Seneviratne et al.: specify the year of publication [Bill Hare, Germany]	Accepted - Reference was edited
50822	24	32	24	32	year of publication is missing in reference "Seneviratne et al...." [Amjad Masood, Pakistan]	Accepted - Reference was edited
1358	24	34	24	35	I suggest to make temperature increase below 1.5°C blue, between 1.5 and 2 'white', and above 2°C 'reddish' in hue. This will show clearer that temperatures tend to be below the average over the oceans and above the average over land [Karen Olsen, Denmark]	Rejected. Figure shading was substantially revised, but it was considered difficult for communication to highlight temperatures with warming less than 1.5 in blue, since they still constitute a warming compared to the pre-industrial period (see also comment #29418). The new colour scheme clearly distinguishes 1.5 and warmer. Distinction between oceans and land is clear in revised figures.
6174	24	34	24	35	I suggest to make temperature increase below 1.5°C blue, between 1.5 and 2 'white', and above 2°C 'reddish' in hue. This will show clearer that temperatures tend to be below the average over the oceans and above the average over land [Anne Olhoff, Denmark]	Rejected. Figure shading was substantially revised, but it was considered difficult for communication to highlight temperatures with warming less than 1.5 in blue, since they still constitute a warming compared to the pre-industrial period (see also comment #29418). The new colour scheme clearly distinguishes 1.5 and warmer. Distinction between oceans and land is clear in revised figures.
18266	24	34	24	35	Suggest to make temperature increase below 1.5°C blue, between 1.5 and 2 'white', and above 2°C 'reddish' in hue. This will show clearer that temperatures tend to be below the average over the oceans and above the average over land [Andrea TILCHE, Belgium]	Rejected. Figure shading was substantially revised, but it was considered difficult for communication to highlight temperatures with warming less than 1.5 in blue, since they still constitute a warming compared to the pre-industrial period (see also comment #29418). The new colour scheme clearly distinguishes 1.5 and warmer. Distinction between oceans and land is clear in revised figures.
30996	24	34	24	35	Maps in figure 3.4 and other similar figures are quite small and hard to read. Also, the desription of the hatching is rather confusing. Does it indicate where models agree on the sign of change w.r.t. pre-industrial or where models agree on the sign of the difference between (a) and (b)? [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Hatching indicates agreement. May be replaced with dots prior to publication.
3466	24	35			Figure 3.4: While I totally understand the meaning of 'local temperature', isn't it more accurante to just say 'temperature'? Temperature changes are provided for each pixel separately, but over the whole world. So it gives a global image of the local variations. [David Docquier, Belgium]	Accepted. This was edited in the final version of the figure.
53066	24	36	25	1	I think the first and the second sentences should be combined as one sentence? [Thian Gan, Canada]	It is not done as suggested
29416	24	39	24	39	A bracket is missing after "(2017)". [Joan A. Lopez-Bustins, Spain]	Not applicable - This sentence was rewritten
49426	24	39	25	1	The word 'Note' should moved from the caption to the next text paragrpaph. [Alexander Chernokulsky, Russian Federation]	It is not done as suggested
50824	24	39	24	39	closing paranthesis is missing in "(adapted from..." [Amjad Masood, Pakistan]	Not applicable - This sentence was rewritten
56730	24	39	24	39	Missed a half bracket after (2017)? [Xiaolin Zhang, China]	Not applicable - This sentence was rewritten
39642	25	1	25	2	Insert a new line between lines 1 and 2. [Hernan Edgardo Sala, Argentina]	Not applicable - The section was rewritten and the figure with caption was deleted
44330	25	1	25	2	Line spacing between Lines 1 and 2 [Rita Man Sze Yu, China]	Not applicable - The section was rewritten and the figure with caption was deleted
15962	25	2	25	10	It is surprising that the text does not comment on the differences in 2C-1.5 warming difference between TXx and TNn. [Australia]	Not applicable - This section was rewritten.
15964	25	2	25	10	The references to "several land regions", "some locations", etc. in this paragraph are too vague. It would be helpful to be more specific about what regions/locations are being referred to. [Australia]	Rejected. This is a section describing global changes. Regional changes are addressed in substantial detail in Sections 3.3.2 and 3.3.3.
15966	25	2	25	6	The relevance of the land-sea warming contrast to regions of high 2C-1.5C warming difference needs to be made more strongly for these sentences to be worth including. It may be better to discuss the 2C-1.5C warming differences first and then simply note that the greatest of these tend to be in land areas with greatest absolute warming. [Australia]	Not applicable - This section was rewritten.
3470	25	4			Replace 'display' by 'displays'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3472	25	8			Replace 'extreme' by 'minimum'. As shown by Fig. 3.5, it is really for TNn that the difference between 2 and 1.5°C is substantial. [David Docquier, Belgium]	Not applicable - This section was rewritten.
15968	25	9	25	9	Change "as well as over sea in the Arctic" to read "as well as over sea in the Arctic and the Pacific sector of the Southern Ocean". [Australia]	No applicable - This section was rewritten and shortened.
13854	25	22	25	30	In the left panel of figure 3.6, the criteria that 2/3 of models are in agreement with their sign is a very weak criteria and tells us little about whether these changes are simply natural variability. In fact, given that essentially none of the large changes over land are hatched tells us that there is no detectible difference between scenarios and the text should reflect that more strongly. [Michael Wehner, United States of America]	Rejected. Hatching is only applied on the right-hand plots. But given confusion, including hatching on left-hand and middle-plots will be considered prior to publication. In addition, caption will be made clearer.
15970	25	22	25	30	Check consistency of use of "changes" and "differences". Is "changes" reserved for changes under 2C and changes under 1.5C? Is "differences" reserved for differences in changes between 2C and 1.5C? [Australia]	Noted. Yes, this is the way these terms have been used.
21772	25	22			Remove empty space after bracket [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39644	25	22	25	22	Delete space after the opening parenthesis. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
44332	25	22	25	22	heavy precipitation (five day maximum [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
60360	25	22	25	30	In the left panel of Figure 3.6, the criteria that 2/3 of models are in agreement with their sign is a very weak criteria and tells the reader little about whether or not these changes are simply natural variability. In fact, given that essentially none of the large changes over land are hatched tells the reader that there is no detectible difference between scenarios and the text should reflect that more strongly. [United States of America]	Rejected. Hatching is only applied on the right-hand plots. But given confusion, including hatching on left-hand and middle-plots will be considered prior to publication. In addition, caption will be made clearer.
10298	25	24	25	25	Compared to changes in temperature, changes in precipitation are not globally uniform and projections are more uncertain. This sentense should emphasise that the sign of future precipiation change is ambiguous in the projections. Suggestion: Compared to changes in temperature, the sign of precipitation change is not globally uniform and projections are more uncertain. [Hungary]	Not applicable - This section was rewritten.
11066	25	24	25	25	Compared to changes in temperature, changes in precipitation […] are more uncertain. - How can one infer from the material presented here that the change in precipitation is "more uncertain"? [Wilhelm May, Denmark]	This can be seen from the fact that models agree less regarding the sign of change of (mean) and extreme precipitation between 1.5°C and 2°C global warming (almost no hatching for precipitation, almost global hatching for temperature).
11980	25	25	25	30	There is a conflict between sentences stating that some regions show substantial changes between 1.5 and 2C and the sentence stating that "The differences are generally small between 1.5C and 2C". This final sentence is also misleading since Figure 3.6 shows ensemble means, which will tend to reduce magnitudes of change seen at regional scales for precipitation in particular. [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
13852	25	25	25	27	The uncertainty representation in Figure 3.6 is a significant step backwards from Figure 12.22 of the IPCC AR5 WG1. In the AR5 figure, confidence in both small and large changes relative to natural variations is depicted by a combination of stippling and hatching. The 1.5 and 2C scenarios show no representation of confidence/uncertainty at all. The left column of AR5 figure 12.22 shows that changes under rcp8.5 at the middle of this century are confidently small compared to natural variations. As that amount of global warming is of a similar magnitude to the 1.5 and 2C scenarios, the statements about “substantial changes” on lines 25-27 of page 3-25 are inconsistent with AR5 WG1, chapter 12. [Michael Wehner, United States of America]	Rejected. The reviewer erroneously assumed that hatching was also applied to left-hand plots. However, we will consider including hatching in the plots prior to publication to avoid this type of confusion. Also the caption will be improved to clarify this point prior to publication.
29420	25	25	25	28	You might be interested in recent results on precipitation extremes over the Eastern Mediterranean by this paper: Mathbout et al. (2017) Observed Changes in Daily Precipitation Extremes at Annual Timescale Over the Eastern Mediterranean During 1961–2012. Pure and Applied Geophysics https://link.springer.com/article/10.1007/s00024-017-1695-7 [Joan A. Lopez-Bustins, Spain]	Noted. This reference is not suitable for this section on global changes but it is cited when assessing regional changes in the chapter.
60362	25	25	25	27	The uncertainty representation in Figure 3.6 is a significant step backwards from Figure 12.22 of the WGI AR5. In the AR5 figure, confidence in both small and large changes relative to natural variations is depicted by a combination of stippling and hatching. The 1.5 and 2°C scenarios show no representation of confidence/uncertainty at all. The left column of AR5 Figure 12.22 shows that changes under RCP8.5 at the middle of this century are confidently small compared to natural variations. As that amount of global warming is of a similar magnitude to the 1.5 and 2°C scenarios, the statements about "substantial changes" on lines 25-27 of page 3-25 are inconsistent with WGI AR5 Chapter 12. [United States of America]	Rejected. The reviewer erroneously assumed that hatching was also applied to left-hand plots. However, we will consider including hatching in the plots prior to publication to avoid this type of confusion. Also the caption will be improved to clarify this point prior to publication.
49124	25	26			Australia also appears as a hotspot worth being mentioned together with the Mediterranean area [Bill Hare, Germany]	Not applicable - This section was rewritten
49126	25	29			On the figure Southern Asia does not appear as an obvious hotspot regarding this particular feature [Bill Hare, Germany]	Not applicable - This section was rewritten. Southern Asia is no longer highlighted.
15972	26	1	26	8	It is not quite clear what the hatching means in this figure. Does it mean "2/3 of the models agree that changes for 2C and changes for 1.5C are of the same sign"? [Australia]	The hatching indicates that 2/3 of the models agree on the sign of the difference between 1.5 and 2.
11982	26	1	26	1	20-year means are insufficient to properly show differences between 2C and 1.5C, so not much can be gleaned from the right-hand column in Figure 3.6. This could be supported by reference to the following paper, which, while looking over broader temperature windows, does at least have clear signal/noise. This paper shows that, for regional precip, the difference between 4C and 2C has quite different spatial patterns (in ensemble mean and individual models) than the change from 0-2C. Good, Peter, et al. "Large differences in regional precipitation change between a first and second 2 K of global warming." Nature communications 7 (2016): 13667. Thus one might expect that the precip change from 1.5-2C may be regionally different than that from 0-1.5C (even if this is hard to see in existing analyses due to weak signal/noise). [United Kingdom (of Great Britain and Northern Ireland)]	Noted. This reference could be considered for inclusion prior to publication.
41586	26	1			Fig 3.6 - One picture and four different scales for %. It is confusing. [Czech Republic]	Noted. In the FGD only analyses for extreme precipitation are included.
28218	26	7	26	7	Wartenburger et al. references a paper describing an online modelling tool which does not contain the plots shown here. Please correct the caption in order to clarify the sources of the plots. [Germany]	The underlying data basis is the data from Wartenburger et al., but the plots have been displayed differently. More details are provided in the Annex. If considered necessary, further information will be added prior to publication.
15974	26	10	26	19	It is surprising that the text does not comment on the fact that the figure shows greater increases with global warming in the frequency of the most extreme extremes (99.9th percentile) than in the frequency of less extreme extremes (e.g. 99th percentile). [Australia]	Not applicable - This text was deleted. The analysis is discussed elsewhere in the FGD (under Section 3.3.2). We do not discuss the different behaviour of rarer hot extremes vs more frequent hot extremes, but this feature is well understood.
61838	26	10	26	10	What are "pre industrial thresholds"? Is "risk" the right wording here, given the meaning allocated to "risks" in this chapter? [Valérie Masson-Delmotte, France]	Not applicable - This text was deleted.
10300	26	14	26	16	It should be noted that the approximately exponential increase in the number of occurrence of extreme days when defined with respect to a given threshold as illustrated in Figure 3.7 is directly tied to the use of a threshold in the definition of extreme indices. This sentense is too complicated, punctuation could be added. Suggestion: It should be noted that the approximately exponential increase in the number of occurrence of extreme days (when defined with respect to a given threshold, as illustrated in Figure 3.7) is directly tied to the use of a threshold in the definition of extreme indices. [Hungary]	Not applicable - This text was deleted. But this point is now addressed in Section 3.3.2 when the text has been clarified.
39646	26	17	26	17	Insert space in "in°C". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44334	26	17	26	17	Space is missing "(i.e. changes in°C or" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
11984	26	18	26	18	changes as a function of global temperature are often close to linear. This will depend on the scale and the analysis. This paper showed with clear signal/noise that the regional-scale precip change from 0-2C has quite different spatial pattern (in the tropics particularly) than that from 2-4C. Good, Peter, et al. "Large differences in regional precipitation change between a first and second 2 K of global warming." Nature communications 7 (2016): 13667. [United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The text mentions "often", it does not state this has a general rule. Several studies have shown that this statement is valid (e.g. Seneviratne et al. 2016, Nature; Wartenburger et al. 2017, GMD; Tebaldi and Knutti 2018, ERL.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
5586	26	19	26	19	Seneviratne et al. …please add the year to the citation [Sandra CASSOTTA, Denmark]	Not applicable - Text was revised.
17316	26	19	26	19	Missing terminal punctuation. [David Schoeman, Australia]	Not applicable - This section was rewritten
39648	26	19	26	19	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
50826	26	19	26	19	year of publication is missing in reference "Seneviratne et al...." [Amjad Masood, Pakistan]	Editorial. Not applicable - Text was revised.
29346	27		27		Figure 3.7 has a bad quality [Borbala Galos, Hungary]	Editorial - copyedit to be completed prior to publication
54690	27				Fig 3.7, high quality fig should be included [Qudsia Zafar, Pakistan]	Editorial. Not applicable. This figure was revised and moved in part to Sections 3.3.2 and 3.3.3. Note that full-resolution figures are not included in main document but are available
5378	27		27		The text is not too clear among the colour. Suggest to increase the contrast [Sulistyawati Sulistyawati, Indonesia]	Editorial - copyedit to be completed prior to publication
1362	27	1	27	6	Figure could easily be dropped [Karen Olsen, Denmark]	Figure was dropped from Section 3.3.1 and parts were moved to Section 3.3.2 and 3.3.3
3474	27	1			Figure 3.7: Resolution of the figure should be enhanced. [David Docquier, Belgium]	Editorial. Not applicable. This figure was revised and moved in part to Sections 3.3.2 and 3.3.3. Note that full-resolution figures are not included in main document but are available
6178	27	1	27	6	Figure could easily be dropped [Anne Olhoff, Denmark]	Figure was dropped from Section 3.3.1 and parts were moved to Section 3.3.2 and 3.3.3
7862	27	1	27	5	Figure 3.7: What is probability ratio? Ratio between what and what? It was never explained, either in the caption or in the text. [Petr Zavialov, Russian Federation]	Not applicable. This figure was moved (part to section 3.3.2 and part to section 3.3.3). Agree with reviewer that it would be useful to define the probability ratio either in main text or in Annex. Will consider this prior to publication.
11986	27	1	27	4	Low resolution figure and I don't understand what the figure is showing me, can the caption be improved? At the least vertical lines marking 1.5C and 2C would help. [United Kingdom (of Great Britain and Northern Ireland)]	Editorial. Not applicable. This figure was revised and moved in part to Sections 3.3.2 and 3.3.3. Note that full-resolution figures are not included in main document but are available. Will consider adding lines for 1.5°C and 2°C on new figures prior to publication.
15976	27	1	27	1	Quality of Figure 3.7 is poor. Legends and labels are not legible [Australia]	Editorial - copyedit to be completed prior to publication
15978	27	1	27	4	The figure caption should explain the meaning of the coloured plumes and thin and thick lines. [Australia]	Editorial. Not applicable. This figure was revised and moved in part to Sections 3.3.2 and 3.3.3. Will consider adding more background information in caption (or in Annex) prior to publication.
15980	27	1	27	1	There is no summary section for Section 3.3.1, whereas there is for both of sections 3.3.2 and 3.3.3. [Australia]	Noted. No summary is included, because Section 3.3.1 serves as introduction to the rest of the section.
15982	27	1	27	4	These figure show results for a continuum of global warming values that are not relevant to this report but, at the same time, do not show the full extent of PR for 2C warming. They could be replaced with smaller figure showing just the results for 0, 1.5 and 2C. [Australia]	Accepted / Not fully applicable. This figure was revised and moved in part to Section 3.3.2 and 3.3.3. There, it was complemented with analyses from Kharin et al. 2018 which provide the type of information that the reviewer is suggesting.
18268	27	1	27	6	is the figure really needed? [Andrea TILCHE, Belgium]	Figure was dropped from Section 3.3.1 and parts were moved to Section 3.3.2 and 3.3.3
53068	27	2	27	2	Define probability ratio. [Thian Gan, Canada]	Noted. Will considered including this definition in the main text or the Annex prior to publication.
13858	27	7	35	20	Section 3.3.2 draws heavily upon the SREX but ignores most of the extreme temperature analysis of the AR5. In particular, no mention of the changes in long period return values are made. As these changes are likely larger than changes in the average of the annual maximum and minimum, differences between the 1.5 and 2C stabilizations may be more apparent. Recent papers that treat this subject directly are: Sanderson et al.(2017) Community Climate Simulations to assess avoided impacts in 1.5?°C and 2?°C futures. Earth System Dynamics, 8, 827-847. https://doi.org/10.5194/esd-8-827-2017 and Wehner, et al (2017) Changes in extremely hot days under stabilized 1.5oC and 2.0oC global warming scenarios as simulated by the HAPPI multi-model ensemble. To appear in Earth System Dynamics. https://www.earth-syst-dynam-discuss.net/esd-2017-89/ . [Michael Wehner, United States of America]	Noted. Text has been substantially revised and new publications have been included. Wehner et al. 2018 is now cited (was not available at the time of the SOD); will consider if Sanderson et al. (2017) should be included prior to publication.
14164	27	7	27	7	When addressing the hot extremes or heat waves in this section, even across the Chapter 3, it seems only consider changes in temperature (e.g., mean or maximum temperature), not taking into account the influence of humidity. The heat-related morbidity and even mortality are more sensitive to the human-perceived equivalent temperature, commonly defined as a function of air temperature, humidity, and other climatic factors. Recent studies have demonstrated that global warming raises human-perceived equivalent temperature more than air temperature under extremely hot conditions. I would suggest to add a specific issue or box focusing on the deadly heat extremes. The following references may be helpful. Mora C, Dousset B, Caldwell I R, et al. Global risk of deadly heat[J]. Nature Climate Change, 2017, 7(7): 501-507. Li J, Chen Y D, Gan T Y, et al. Elevated increases in human-perceived temperature under climate warming[J]. Nature Climate Change, 2018: 1. [Rongshuo Cai, China]	Rejected. Study does not consider specifically 1.5 vs 2°C. However, impact of humidity for health is relevant and should be mentioned in the chapter. To be checked prior to publication in Section 3.4 (and possibly add a sentence on this point in Section 3.3.2)
60364	27	7	35	20	Section 3.3.2 draws heavily upon SREX but ignores most of the extreme temperature analysis of the AR5. In particular, no mention of the changes in long period return values are made. As these changes are likely larger than changes in the average of the annual maximum and minimum, differences between the 1.5 and 2°C stabilizations may be more apparent. Recent papers that treat this subject directly are: Sanderson et al. (2017) Community Climate Simulations to assess avoided impacts in 1.5°C and 2°C futures. Earth System Dynamics, 8, 827-847. https://doi.org/10.5194/esd-8-827-2017 and Wehner et al. (2017) Changes in extremely hot days under stabilized 1.5°C and 2°C global warming scenarios as simulated by the HAPPI multi-model ensemble. To appear in Earth System Dynamics. https://www.earth-syst-dynam-discuss.net/esd-2017-89/ . [United States of America]	Noted. Text has been substantially revised and new publications have been included. Wehner et al. 2018 is now cited (was not available at the time of the SOD); will consider if Sanderson et al. (2017) should be included prior to publication.
19158	27	11	28	22	It may be worthy to mention in section 3.3.2.1 the study by Turco et al. (2015), showing a global increase in mean temperatures and in the occurrence of unprecedented high temperatures during the past decades, based on several observational datasets. REF: Turco, M., Palazzi, E., Hardenberg, J., and Provenzale, A. (2015). Observed climate change hotspots. Geophysical Research Letters, 42(9), 3521-3528. [Sonia Jerez, Spain]	Noted. May consider to include prior to publication.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35050	27	11	27	18	Following study should be cited in the start of the section: A warming of 0.5?°C (from 1.5?°C to 2?°C) leads to significant increases in temperature and precipitation extremes in most regions. However, the projected changes in climate extremes under both warming levels highly depend on the pathways of emissions scenarios, with different greenhouse gas (GHG)/aerosol forcing ratio and GHG levels. References: Zhili Wang, Lei Lin, Xiaoye Zhang, Hua Zhang, Liangke Liu & Yangyang Xu (2017). Scenario dependence of future changes in climate extremes under 1.5?°C and 2?°C global warming,Scientific Reports, 7, doi:10.1038/srep46432 [Shaukat Ali, Pakistan]	Noted. Will consider adding a reference to this study prior to publication if critical for chapter.
3476	27	12			Replace 'tend' by 'tends'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
15984	27	12	27	25	There is no mention of increases in regional mean temperatures for a 0.5C global warming and it appears separately from the section on projections for 1.5 and 2C, rendering it largely irrelevant. [Australia]	Not sure what the reviewer is referring to. If this is related to the results from Schleussner et al. 2017, these are now mentioned in Section 3.3.2
50970	27	12	27	13	SREX report is cited several times, although AR5 can be cited as reference in the same cases as in this part for example [Fatima Driouech, Morocco]	Rejected. Better quality of temperature observations was explicitly mentioned in the SREX but not in the AR5 chapter 2.
53070	27	12	27	18	Re-phrase some sentences that are not well written? [Thian Gan, Canada]	It is still the same text
15986	27	15	27	16	The point about biases in estimated global mean surface temperature may well be true, but mentioning it here distracts from the discussion on regional temperature. [Australia]	Noted. May remove the point on GMST prior to publication since it is mentioned in Section 3.3.1.
12016	27	24	27	24	presumably to 95% confidence - phrase unnecessary, remove. [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. This text has been removed.
46670	27	26	27	26	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Do not understand comment from reviewer. Referred text is using the IPCC uncertainty language (is also used throughout this section).
15988	27	27	28	4	The relevance of most of this text is not clear. Relevance could be better established if p27, line 39 to p29, line 4 appeared at the beginning of the paragraph and if it was closely linked to the projections section. [Australia]	Noted. Text has been substantially rewritten and condensed.
35286	27	27	27	37	There are many recent attribution studies of regional changes in temperature extremes (as listed below), which need to be cited properly with updated assessments. Kim, Y.-H., S.-K. Min, X. Zhang, F. Zwiers, L. V. Alxander, M. G. Donat, and Y.-S. Tung, 2016: Attribution of extreme temperature changes during 1951-2010. Climate Dyn., 46, 1769-1782, doi: 10.1007/s00382-015-2674-2. King, A. D., M. T. Black, S.-K. Min, E. M. Fischer, D. M. Mitchell, L. J. Harrington, and S. E. Perkins-Kirkpatrick, 2016: Emergence of heat extremes attributable to anthropogenic influences. Geophys. Res. Lett., 43, 3438-3443, doi:10.1002/2015GL067448 Min SK, Zhang X, Zwiers FW, Shiogama H, Tung YS, Wehner M (2013) Multimodel detection and attribution of extreme temperature changes. J Clim 26:7430–7451 Morak S, Hegerl GC, Christidis N (2013) Detectable changes in the frequency of temperature extremes. J Clim 26:1561–1574 Sun Y, Zhang X, Zwiers FW, Song L, Wan H, Hu T, Yin H, Ren G (2014) Rapid increase in the risk of extreme summer heat in Eastern China. Nat Clim Change 4:1082–1085. doi:10.1038/nclimate2410 [Seung-Ki Min, Republic of Korea]	Noted. Regional attribution studies could generally not be cited in the main text due to space limitation. Will check if mentioned studies may be useful to be added as reference prior to publication, in particular if SPM draws substantially on attribution assessments..
55988	27	27	27	27	Some of the most robust observational changes have occurred in the Arctic and are well-documented in SWIPA (2017), noted above, including temperature extremes, sea ice and snow cover loss (including in different seasons), etc. A paragraph citing these changes could easily be provided and fit well into this narrative. [Pamela Pearson, United States of America]	Rejected. Not sure what "SWIPA (2017)" is referring to. There is a web page (https://www.amap.no/swipa2017), but not sure that reports are peer-reviewed.
56618	27	27	28	4	The only refernces to observed and attributed changes in extremes in this section is to the SREX report. The whole literature on event attribution is not even mentionedeven though some, especially in the BAMS special reports that exit since 2012 are for large regions and not just indivdual events. https://www.ametsoc.org/ams/index.cfm/publications/bulletin-of-the-american-meteorological-society-bams/explaining-extreme-events-from-a-climate-perspective/ [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Noted. Literature on attribution could not be expanded because of space limitations. Some literature is mentioned in the Annex. Will consider adding a reference to the BAMS special reports in the main text prior to publication.
46668	27	28	27	28	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Do not understand comment from reviewer. Referred text is using the IPCC uncertainty language, e.g. "likely" in italics. (IPCC language is also used throughout this section). Maybe this is referring to another section?
30862	27	29	27	31	Well (2018) is for australian buildings only. The statement is evident anyway, including the second part which only applies to commertial buildings (Ruparathna et al 2016). [Érika Mata, Sweden]	Rejected. Well (2018) is not cited in this section. Was the comment misplaced?
271	27	35	27	35	.....heat waves have increased..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
15990	27	38	35	48	It is surprising that the King et al. (2017) reference on Australian climate extremes and Andrew D King and David J Karoly 2017 Environ. Res. Lett. 12 114031 are not mentioned in Section 3.3.2.2. [Australia]	Noted. Could not include regional studies because of space limitations. May be considered for annex or possibly main text prior to publication.
49128	27	39	28	2	a 0.5°C global warming can also be identified for temperature extremes in a few large regions does not make sense [Bill Hare, Germany]	Accepted. The section was rewritten.
50976	27	42	28	42	Please add AR5 (WGI) as a reference and if possible other more recent papers [Fatima Driouech, Morocco]	Accepted. Text has been substantially rewritten. New publications have been included.
17694	28		35		Add recently studies for East Asia. We note some references, here. Kim, Y.-H., S.-K. Min, X. Zhang, F. Zwiers, L. V. Alxander, M. G. Donat, and Y.-S. Tung, 2016: Attribution of extreme temperature changes during 1951-2010. Climate Dyn., 46, 1769-1782, doi: 10.1007/s00382-015-2674-2. King, A. D., M. T. Black, S.-K. Min, E. M. Fischer, D. M. Mitchell, L. J. Harrington, and S. E. Perkins-Kirkpatrick, 2016: Emergence of heat extremes attributable to anthropogenic influences. Geophys. Res. Lett., 43, 3438-3443, doi:10.1002/2015GL067448 Min SK, Zhang X, Zwiers FW, Shiogama H, Tung YS, Wehner M (2013) Multimodel detection and attribution of extreme temperature changes. J Clim 26:7430–7451 Morak S, Hegerl GC, Christidis N (2013) Detectable changes in the frequency of temperature extremes. J Clim 26:1561–1574 Sun Y, Zhang X, Zwiers FW, Song L, Wan H, Hu T, Yin H, Ren G (2014) Rapid increase in the risk of extreme summer heat in Eastern China. Nat Clim Change 4:1082–1085. doi:10.1038/nclimate2410 [Republic of Korea]	Noted. Did not include suggested studies because of space limitations. If considered critical for assessment, could be added prior to publication.
1364	28	6	28	22	Interesting but not sufficiently important. Could be addressed briefly when addressing impacts on urban areas. [Karen Olsen, Denmark]	Accepted. Text was donated to Section on urban impacts
1790	28	6	28	35	These two paragraphs on the urban hea island effect are rather general and different from the rest of the text presenting the observed impact. [Greece]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts

Comment No	From Page	From Line	To Page	To Line	Comment	Response
3480	28	6	28	35	While these two paragraphs are interesting, they do not answer the question of observed recent changes in cities. They discuss more the UHI intensity in terms of seasonal cycle. Consider removing these paragraphs. [David Docquier, Belgium]	Not applicable. These paragraph were removed and text was donated to section on urban impacts
6180	28	6	28	22	Interesting but not sufficiently important. Could be addressed briefly when addressing impacts on urban areas. [Anne Olhoff, Denmark]	Accepted. Text was donated to Section on urban impacts
10404	28	6	28	35	the relation to 1.5 vs 2°C is really unclear for this section [Christopher Reyer, Germany]	Not applicable. These paragraph were removed and text was donated to section on urban impacts
15992	28	6	28	35	Despite a very long discussion of extreme heat events in cities, there is no clear summary of the issues. For example, would extremes increase more or less in ciities? [Australia]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts
15994	28	6	28	35	The relevance of this text is unclear as there is no mention of the effects of global warming, let alone 0.5C of global warming or projections, on UHI [Australia]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts
18270	28	6	28	35	This section should mention the Urban Heat Island effect in the context of climate change or not at all. i.e. what evidence is there regarding how the UHI effect, and its impacts, may worsen at 1.5°C, 2°C or higher? Insights in this area should also be merged with those on page 128 [Andrea TILCHE, Belgium]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts
13856	28	6	28	35	Page 3-28, lines 6-35. The discussion about cities is incomplete, as it does not include the effects of aerosols on urban heat waves. Especially in some large Asian cities, the stagnant conditions that can lead to heat waves also leads to high air pollution. This has two effects on human health. First, the air pollution leads to respiratory and other ailments. Second, the reflective nature of aerosols decreases the magnitude of very extreme high temperatures. During these stagnant periods, aerosol loading is higher than the seasonal average. Stabilized scenarios generally also presume a reduction of aerosol forcings from the current loading as energy production moves away from fossil fuels mitigating both of these effects. Some discussion of these issues is warranted. [Michael Wehner, United States of America]	Not applicable. These paragraph were removed and text was donated to section on urban impacts
31476	28	6	28	22	It is explained that some items influence to the strength of UHI; however, the effect of climate change is not included. In the first paragraph, it would be better to announce that climate change is basically out of the forcing elements in the strength of UHI. [Japan]	Not applicable. This section was removed and text was donated to section on urban impacts
41472	28	6	28	22	Here, "UHI" effect is discussed. There, only some social influence and some other effects rahter than the Climate change has been discussed. They had better say that the climate change is basically out of the main forcing factor in UHI, here. [Izuru Takayabu, Japan]	Not applicable. This section was removed and text was donated to section on urban impacts
49130	28	6	28	35	It would not harm to add a summary sentence stating that overall, there is good evidence that the regional temperature increases that have been observed and attributed to climate change have been amplified in urban environments, recognising the particularly striking example of heatwaves but also recognising some exceptions. [Bill Hare, Germany]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts
60366	28	6	28	35	The discussion about cities is incomplete, as it does not include the effects of aerosols on urban heat waves. Especially in some large Asian cities, the stagnant conditions that can lead to heat waves also leads to high air pollution. This has two effects on human health. First, the air pollution leads to respiratory and other ailments. Second, the reflective nature of aerosols decreases the magnitude of very extreme high temperatures. During these stagnant periods, aerosol loading is higher than the seasonal average. Stabilized scenarios generally also presume a reduction of aerosol forcings from the current loading as energy production moves away from fossil fuels mitigating both of these effects. Some discussion of these issues is warranted. [United States of America]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts
61840	28	6	28	35	Brief introducting to urban heat island (not exhaustive assessment of literature). Is it needed here? I suggest to summarize this and merge with other elements of impacts and risks for cities in a common box, not diluated across various sections as it is now. [Valérie Masson-Delmotte, France]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts
62326	28	6	28	22	What about Subsaharan Africa? [JACQUES-ANDRE NDIONE, Senegal]	Do not understand why reviewer asks about Subsaharan Africa. This section was on changes in extreme heat in cities. This section is no longer included.
46052	28	9	28	9	Change wording from "soil" to more broad "surface". [Justin Oogjes, Australia]	Not applicable - This text was deleted
28220	28	11	28	16	Reference for urban heat island effect is from 2015 but afterwards a paper from 2003 on frequency and intensity of the urban heat island effect is cited. Thus, the first reference cannot be the reference paper for the urban heat island effect. Also the description of the UHI is older than from 2015. Please add a correct reference. [Germany]	Not applicable. These paragraphs were removed and text was donated to section on urban impacts.
44928	28	12	28	14	At mid-latitudes, it is characterized by a daily cycle having its maximum intensity at night, a minimum of intensity generally before dawn--> Show some references. I don't think minimum intensity generally appear before dawn, because the minimum temperature which usually much lower than that in urban area appears just before dawn. [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
46054	28	12	28	22	More logic in putting the section on "other" mechanisms before the sections on "cycles" and sentence on "phase and amplitude deviations". Main local causes first, then regional and global variations. [Justin Oogjes, Australia]	Not applicable. This text was deleted
50828	28	12	28	12	Urban Heat Iland (UHI) instaead of "urban heat iland (UHI)" [Amjad Masood, Pakistan]	Not applicable - This text was deleted
3478	28	15	28	16	Seasonal cycles' of what? [David Docquier, Belgium]	Not applicable - This text was deleted
43610	28	15	28	16	We also have to note that urban (re)development in Asian cities, especially in Korea and China made significant impacts on local climate (Hong and Hong, 2016; Changes in the Seoul metropolitan area urban heat environment with residential redevelopment, Journal of Applied Meteorology and Climatology, 55, 1091-1106) [Jinkyu Hong, Republic of Korea]	Not applicable - This text was deleted
56282	28	15	28	15	Remove "during the day". [Annika Herbert, Australia]	Not applicable - This text was deleted
5588	28	22	28	22	the citation Chow et al. 2014 is missing in the reference list….please check also that all the other citations in the text do not have missing references….and of course also check the opposite….that references in the reference list are not cited in the text. [Sandra CASSOTTA, Denmark]	Not applicable - This text was deleted
35886	28	23	28	35	UHI information for India is available in the following reference and may be added: Kumar, R., V. Mishra*, J. Buzan, R. Kumar, D. Shindell, and M. Huber, 2017: Dominant control of agriculture and irrigation on urban heat island in India. Sci. Rep. Nat. Publ. Group, 7, 1 [India]	Not applicable - This text was deleted
1366	28	24	28	35	Focus on impacts at 1.5 and 2 [Karen Olsen, Denmark]	Not applicable - This text was deleted
6182	28	24	28	35	Focus on impacts at 1.5 and 2 [Anne Olhoff, Denmark]	Not applicable - This text was deleted
50978	28	24	33	25	Please complete the sentence and add the year to the reference Seneviratne et al. [Fatima Driouech, Morocco]	unclear what this comment refers to

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53072	28	25	28	35	I will suggest also adding a small discussion of changes in the apparent temperature (AP), the human-perceived equivalent temperature? For example, Li et al. (2018) shows that under climate warming, both reanalysis data sets and Global Climate Model simulations indicate that AP has increased faster than air temperature (AT) over land. The faster increase in AP has been especially significant over low latitudes. The global land average AP increased at 0.04 °C per decade faster than AT before 2005. This trend is projected to increase to 0.06 °C per decade and 0.17 °C per decade under the Representative Concentration Pathway 4.5 scenario (RCP4.5) and RCP8.5, respectively. Li, J., Y., Chen, D., Gan, T.Y., and Lau, G.N.C., 2018, Elevated increases in human-perceived temperature under climate warming, Nature Climate Change, Nature Publishing Group, doi.org/10.1038/s41558-017-0036-2 [Thian Gan, Canada]	Not applicable - This text was deleted
31016	28	35	28	35	reference Hamdi et al., 2016 is missing; Hamdi, R., F. Duchêne, J. Berckmans, A. Delcloo, C. Vanpoucke, P. Termonia, Evolution of urban heat wave intensity for the Brussels Capital Region in the ARPEGE-Climat A1B scenario, Urban Climate, Volume 17, Septembmber 2016, Pages 176-195, ISSN 2212-0955, http://dx.doi.org/10.1016/j.uclim.2016.08.001. [Rafiq Hamdi, Belgium]	Not applicable - This text was deleted
39650	28	35	28	35	Insert space after ";" [Hernan Edgardo Sala, Argentina]	Not applicable - This text was deleted
41530	28	35	28	35	2013; Hamdi [Sergio Aquino, Canada]	Not applicable - This text was deleted
12018	28	38	28	38	Lewis et al on Australian temperature extremes should be included here http://onlinelibrary.wiley.com/doi/10.1002/2017GL074612/full as should King and Karoly on Europe http://iopscience.iop.org/article/10.1088/1748-9326/aa8e2c and Li et al on East Asia http://onlinelibrary.wiley.com/doi/10.1002/2017GL076753/full. Also, see Harrington and Otto which should be included somewhere in this chapter or chapter 5 http://iopscience.iop.org/article/10.1088/1748-9326/aaaa99/meta. And Diffenbaugh et al for a variety of extremes, not just this particular section http://advances.sciencemag.org/content/4/2/eaao3354 [United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Cannot include regional studies because of space limitations. May be reconsidered prior to publication if material appears particularly relevant.
48228	28	38	40	34	The analysis of projected regional temperature and precipitation changes places some emphasis on projections from the HAPPI campaign, with few results from the regional climate modelling community (e.g. CORDEX) outside of Europe. In addition, no mention is made to the uncertainty associated with the timing of reaching 1.5°C across the discussed studies. I noted that emerging literature of the regional expression of the 1.5°C exist over China and Africa, particularly using regional climate models, which may strengten some of the concusions of this Chapter. An important question for some readers would be whether projected changes are consistent across the different tools/models (CMIP5, HAPPI, CORDEX, Statistical downscaling) ..etc and what my be the potential underlying cause? [Sarah Connors, France]	Rejected. Because of strong space limitation, regional assessments had to be moved to the Annex. Will consider possibly expanding list of referenced studies in the Annex prior to publication.
12020	28	40	28	44	I don't think this paragraph is necessary, the sentence beginning on line 46 is sufficient for introducing the section - remove for brevity, [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. Text has been substantially revised.
46672	28	40	28	40	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable. Text has been substantially revised.
15996	28	41	28	41	It would be helpful to replace "in some regions" with something more specific. [Australia]	Not applicable - This section was rewritten
272	28	42	28	42	.....at global and continental scales..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
15998	28	43	28	43	The reference to "global warming of less than 1C" is confusing. Does this refer to warming that has already taken place relative to pre-industrial times or a further 1C of global warming relative to the recent climate? [Australia]	Not applicable. Sentence has been removed in revised text.
41532	28	43	28	43	delete: More detailed….hereafter. [Sergio Aquino, Canada]	Accepted - This section was revised
53074	28	44	28	44	Regional assessments should also be based on regional observed data or regional climate projections? [Thian Gan, Canada]	Not applicable. Sentence has been removed in revised text.
1368	28	46	29	7	Should be described in the figure caption only [Karen Olsen, Denmark]	Accepted - This section was revised
6184	28	46	29	7	Should be described in the figure caption only [Anne Olhoff, Denmark]	Accepted - This section was revised
10302	28	47	28	48	The two mentioned data bases here should be more explained.The 3.2 Section is written as a source, but we did not find a clear definition. [Hungary]	Not applicable. This text was substantially revised
17318	28	47	28	47	Is a scaling relationship really a database? [David Schoeman, Australia]	Accepted - This section was revised
32466	28	47	28	48	Please provide a very brief description of how the methods from the 2 databases intercompare. [Rosanne Martyr-Koller, Germany]	Not applicable. This text has been substantially revised
10304	29	1	30	7	The explanation of Figure 3.8 is not relevant to the figure itself. First, the orange and blue colors are mentioned to refer to the CMIP5 simulations (RCP8.5 and RCP2.6), but on Figure 3.8, these colors show HAPPI results, and only RCP8.5 can be seen according to the legend. [Hungary]	Accepted. This sentence is no longer included.
16000	29	1	29	3	The text describing the presentation of RCP8.5 and RCP2.6 in Figure 3.8 does not appear to be consistent with what is actually shown in the figure (e.g. no RCP2.6 results are shown in the figure and the red and blue ranges refer to results for 2C and 1.5C global warming. [Australia]	Accepted. This sentence is no longer included.
273	29	2	29	2	Finding that acronyms or "condensed identifiers" such as "RCP 8.6 or 2.6", for examaple, can cause consternation when trying to recall or find the meaning of these kinds of terminology for users not well-versed in recognizing the meanings. Perhaps repeated longer discriptions of these "short-cuts" or directions to the glossery would help reduce the burden on the reader??? [Paul Doyle, Canada]	Accepted. This sentence is no longer included.
3490	29	2			I do not see any blue range in Fig. 3.8 (RCP2.6). [David Docquier, Belgium]	Accepted. This sentence is no longer included.
12022	29	2	29	2	The figure itself labels the blue and orange range as 1.5 and 2°C of warming, respectively, not RCP2.6 and RCP8.5 - be consistent and clear with the scenarios analysed and how this relates to degrees of warming as this gets quite confusing throughout the chapter particularly given that elsewhere RCP4.5 is used as a proxy for 2°C warming. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. This sentence is no longer included.
28222	29	2	29	3	RCP2.6 (blue) is not included in figure 3.8. [Germany]	Accepted. This sentence is no longer included.
28224	29	3	29	7	This conclusion seems to assume that the climate system is in equilibrium by the end of the century in RCP2.6 which might not be the case. Please clarify [Germany]	Not applicable. This sentence is no longer included in this section.
1370	30				Figure 3.8 (and similar subsequent figures): there is too much information: focus on the central figure only. If at all necessary, the regional graphs could be placed in an annex (not recommended though) or published elsewhere [Karen Olsen, Denmark]	Rejected. The regional information is critical for several readers of the report.
6186	30				Figure 3.8 (and similar subsequent figures): there is too much information: focus on the central figure only. If at all necessary, the regional graphs could be placed in an annex (not recommended though) or published elsewhere [Anne Olhoff, Denmark]	Rejected. The regional information is critical for several readers of the report.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17830	30				In Figure 3.9 (and also Figure 3.12), the region can be zoned by Low-Latitude, Mid-Latitude, and High Latitude. The mid-latitude zone can be broadly defined as part of the hemisphere between 30°–60° latitude. This zone is home to over 50 % of the world population and encompasses about 36 countries throughout the principal region, which host most of the world's development and poverty related problems. Moon, J., Lee, W.K., Song, C., Lee, S.G., Heo, S.B., Shvidenko, A., Kraxner, F., Lamchin, M., Lee, E.J., Zhu, Y., Kim, D., Cui, G. 2017. An introduction to Mid-Latitude ecotone: Sustainability and environmental challenges. Sib. J. For. Sci. N. 6:41-53. [Republic of Korea]	Rejected. Regional information was considered more relevant than zonal information.
18272	30				Figure 3.8 (and similar subsequent figures): there is too much information: focus on the central figure only. If at all necessary, the regional graphs could be placed in an annex (not recommended though) or published elsewhere [Andrea TILCHE, Belgium]	Rejected. The regional information is critical for several readers of the report.
54692	30				Fig 3.8-3.9, axis titled and legend not easily visible [Qudsia Zafar, Pakistan]	Editorial. Have tried to improve. Note that included figure is not the full resolution figure. Readability could be further improved prior to publication.
7864	30	1	30	8	Figure 3.8: How were the confidence bars to the HAPPI outcome calculated? Please explain. [Petr Zavialov, Russian Federation]	Accepted. More details are now provided in the figure caption as well as in the Annex.
16002	30	1	32	5	It is not obvious that all the information in Figure 3.8 and Figure 3.9 needs to be presented and the figures could perhaps be simplified. Firstly, it is likely not necessary for the figure to demonstrate the scaling of regional extremes with global temperature for all regions - a citation in the text or a examples for one or two regions would likely suffice to make this point. Secondly, there is a duplication of key conclusions between Figure 3.5 and Figures 3.8/3.9. Consideration should be given to whether both the CMIP5 and HAPPI results need to be presented and, if so, whether they should be presented together in a single figure. Thirdly, the figures would better support the text if projected changes for 1.5C of global warming was shown in the maps, rather than differences in projections between 1.5C and 2.0C. [Australia]	Noted. We have moved the figure for TNn to the Annex. The previous Figure 3.8 (now 3.5) was else kept the same, since regional information is important for several readers. In addition, the difference between 1.5°C and 2°C climate is the most relevant information for the readers (but maps for 1.5°C and 2°C are also available in Fig. 3.4).
28226	30	1	30	4	Results from German project ReKliEs-De could be cited for central Europe (http://reklies.hlnug.de/startseite/) [Germany]	Rejected. Too regional, cannot focus on results for single countries.
3482	30	3			Figure 3.8: It would be better to rotate the figure by 90° (portrait mode). [David Docquier, Belgium]	Accepted. This was done in the FGD even though this implies a smaller and thus possibly less readable figure.
3484	30	3			Figure 3.8: Wouldn't it be more interesting to plot 'Delta TXx / Delta Tglob' instead of 'Delta TXx' for the map? It would show the change of annual max daytime temperature per degree warming. This ratio seems to be between 1.3 and 1.5 for the global land, meaning that TXx increases more rapidly than Tglob. [David Docquier, Belgium]	Rejected. We thought that it was more relevant to highlight regions displaying significant differences between 1.5°C and 2°C global warming.
3492	30	3			Figure 3.8: Is there any difference between the map of this figure and the third panel of Fig. 3.5? If not, consider removing the latter. [David Docquier, Belgium]	Yes. The map of this figure is based on the HAPPI simulations.
13938	30	3	30	7	I really like this figure and find it easy to understand, except statistically exactly the color ranges, and what the 'boxes' and 'whiskers' represent: please add this information to the figure caption (ie. One standardd deviation, range of model runs, etc.) [Natalie MAHOWALD, United States of America]	Noted. More information is now included in the figure caption as well as in the Annex. However, could add a sentence on boxes and whiskers in caption prior to publication to improve readability.
35052	30	3	30	7	Figure caption is long and not clear : Projected changes in annual maximum daytime temperature (TXx) as function of global temperature warming for IPCC SREX regions, based on empirical scaling relationship applied to CMIP5 data (adapted from Seneviratne et al., 2016 and Wartenburger et al., 2017) together with projected changes from the HAPPI multi-model experiment (Mitchell et al., 2017b) (bar plots on regional analyses and central plot). After Seneviratne et al. [Shaukat Ali, Pakistan]	Accepted. Caption was substantially revised and expanded.
16004	30	4	30	4	replace "CMIP5 data" with "CMIP5 output" CMIP model outputs are not data. [Australia]	Rejected. Ok to refer to model output as "data", since data simply refers to stored digital information. But not critical, could still be revised prior to publication.
29422	30	6	30	7	Please review writing. The same for Figures 3.9 and 3.12. [Joan A. Lopez-Bustins, Spain]	Accepted. Caption was substantially revised and expanded.
7086	30	7			After Seneviratne et al. - year? [Dmitry L. Musolin, Russian Federation]	Figure caption was revised
21774	30	7			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Figure caption was revised
39652	30	7	30	7	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Figure caption was revised
50830	30	7	30	7	year of publication is missing in reference "Seneviratne et al...." also the sentence does not make sense,may need to be completed [Amjad Masood, Pakistan]	Editorial. Accepted. Reference was edited.
7794	31		32		would suggest using a consistent color scheme for both figures. Without looking at the scale a reader could think the warming is larger for max temepratures, when the reverse is true. [Anthony Lupo, United States of America]	Not applicable. The previous Fig. 3.9 has been moved to the Annex. However, will consider changing the colour bar to make it consistent with the figure for TXx (now Fig. 3.5) prior to publication.
14166	31	2	31	4	The region where display hot extremes should cover Southern East Asia? Figure 3.8 and Figure 3.10 show substantial changes in hot extremes in Southern East Asia, which is comparable to Eastern North America. In addition, recent literature as follows reported high risk of extreme summer heat in the above region especially the Eastern China. Sun Y, Zhang X, Zwiers F W, et al. Rapid increase in the risk of extreme summer heat in Eastern China[J]. Nature Climate Change, 2014, 4(12): 1082-1085. [Rongshuo Cai, China]	Rejected. In terms of absolute changes, Southern East Asia has a substantially lower warming compared to the other listed regions.
16006	31	5	31	5	The term "transitional climate regimes" is not widely used in climate science. This needs a better explanation. Also, the areas listed include a wide variety of climate types. [Australia]	Not applicable. This sentence has been removed and we no longer refer to "transitional climate regimes" in the main text. Background information is provided in the Annex.
53076	31	8	31	8	Does enhanced greenhouse forcing always lead to enhanced drying, or rather to hydrologic extremes which could either be enhanced drying or flooding? [Thian Gan, Canada]	Not applicable. This sentence has been removed. No, greenhouse gas forcing does not always lead to drying, but it tends to lead to drying in these transitional climate regimes.
19340	31	13	31	49	You may also consider adding the findings of a recently published study (submitted before the SR15 deadline) by Betts et al. In this study in order to provide more detailed representations of processes and impacts a set of high resolution global simulations (HadGEM3A-GA3.0) have been performed. It was found that hot extremes are foressen to become even hotter, with increases being more intense than seen in CMIP5 projections. The largest regional differences in temperature extremes between 2°C and 1.5°C are simulated for the mid-latitudes. Reference: Betts RA et al. 2018 Changes in climate extremes, river flows and vulnerability to food insecurity projected at 1.5°C and 2°C global warming with a higher-resolution global climate model. Phil. Trans. R. Soc. A 20160452. http://dx.doi.org/10.1098/rsta.2016.0452 [Aristeidis Koutroulis, Greece]	Noted. This study is cited in the chapter. However, it is not included here because it is based on a single model.
46674	31	14	31	14	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - This section was rewritten.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39654	31	16	31	16	Insert space between brackets in: "...2013)(see also..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
62328	31	16	31	16	Instead of wrting "Orlowsky and Seneviratne, 2013)(see also Section 3.3.4)", please write "Orlowsky and Seneviratne, 2013; see also Section 3.3.4)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
49868	31	24	31	28	Too simplistic with N-S warming gradient in summer in Europe. Large changes also in the far north so a N-S-N gradient would be better. Kjellström et al (https://www.earth-syst-dynam-discuss.net/esd-2017-104/esd-2017-104.pdf) discuss both 1.5 and 2C. [Erik Kjellström, Sweden]	Not applicable. This section was rewritten and regional material was moved to the Annex.
54290	31	24	31	26	Not clear what 'distributional patterns' means here. Also, presumably the reference to 1.5 degC warming here also means global warming? [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
274	31	25	31	25	.....warming than the global..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
482	31	25	31	25	A typo: "warming thanthe global" should be "warming than the global" [Taoyuan Wei, Norway]	Not applicable - This section was rewritten
3486	31	25			Separate 'than' and 'the'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3488	31	25			Separate 'Europe' and 'for'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3710	31	25			Space between than and the; and between Europe and for [Castor Muñoz Sobrino, Spain]	Not applicable - This section was rewritten
6486	31	25	31	25	warming thanthe global' should be 'warming than the global' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
6488	31	25	31	25	across Europefor global' should be 'across Europe for global' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7512	31	25	31	25	…warming than the…across Europe for… [Jens Zinke, Germany]	Not applicable - This section was rewritten
7790	31	25			space between than and the. [Anthony Lupo, United States of America]	Not applicable - This section was rewritten
7792	31	25			space between Europe and for [Anthony Lupo, United States of America]	Not applicable - This section was rewritten
10680	31	25	31	25	Change to 'higher warming than the global average…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
10682	31	25	31	25	Change to 'patterns across Europe for global warming…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21776	31	25			insert space between "thanthe" and also between "Europefor" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
29424	31	25	31	25	Please review writing. [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
35054	31	25	31	25	There need to be a space between words "Europefor". The correct expression is "Europe for" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
39656	31	25	31	25	Insert space in "thanthe" and in "Europefor" also. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
39962	31	25	31	25	missing space in "Europefor" [Adi Nugraha, United States of America]	Not applicable - This section was rewritten
40202	31	25	31	25	a space is needed between some words "thanthe" and "Europefor" [Amal Hussein, Egypt]	Not applicable - This section was rewritten.
44336	31	25	31	25	Space is missing "warming thanthe global" and "across Europefor global" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
44930	31	25	31	25	thanthe-->than the [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
44932	31	25	31	25	Europefor Europe for [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
50832	31	25	31	31	...than the global... instead of "...thanthe global...", "...across Europe for global..." instead of "...across Europefor global..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
56766	31	25	31	25	Missed a space after "higher warming than…" and "Europe…." [Xiaolin Zhang, China]	Not applicable - This section was rewritten
62330	31	25	31	25	Instead of writing "higher warming thanthe global", please write "higher warming than the global" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
19338	31	26			Jacob et al. has been published: Jacob, D., Kotova, L., Teichmann, C., Sobolowski, S. P., Vautard, R., Donnelly, C., Koutroulis, A. G., Grillakis, M. G., Tsanis, I. K., Damm, A., Sakalli, A., & van Vliet, M. T. H. (2018). Climate Impacts in Europe Under +1.5?C Global Warming, Earth's Future, 6. https://doi.org/10 .1002/2017EF000710 [Aristeidis Koutroulis, Greece]	Not applicable. This section was rewritten and shortened. Regional information was moved to the Annex.
50834	31	26	31	26	the reference in process of publishing may not be referred like (Jacob et al. in review) [Amjad Masood, Pakistan]	Not applicable. This section was rewritten and this publication is no longer referred to here.
53078	31	26	31	26	Why cite a paper under review, though it should be acceptable if it will be accepted by the time this SR15 report is published? [Thian Gan, Canada]	Not applicable. This section was rewritten and this publication is no longer referred to here.
62332	31	26	31	26	Please, verify this reference "Jacob et al, in review" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
49870	31	27	31	28	Discrepancies between GCMs and RCMs may be due to differences in aerosol treatment but it may also be a number of other reasons like differences in soil schemes, convection etc. [Erik Kjellström, Sweden]	Not applicable. This section was rewritten and this sentence is no longer included.
10306	31	30	31	34	This paragraph might be upper in the text, for example start in the line 18, after the soil moisture-temperature coupling was written first time. [Hungary]	Not applicable. This section was rewritten.
19160	31	33	31	33	The discrepancies in the projections from regional vs. global climate models in Europe mentioned here refer, in particular, to the surface downward solar radiation (I would mention it) and were first reported by Jerez et al. (2015). REF (NOTE THAT THIS REFERENCE IS ALREADY INCLUDED IN CHAPTER 3): Jerez, S., Tobin, I., Vautard, R., Montávez, J.P., López-Romero, J.M., Thais, F., Bartok, B., Christensen, O.B., Colette, A., Déqué, M., and Nikulin, G. (2015). The impact of climate change on photovoltaic power generation in Europe. Nature communications, 6, 10014. [Sonia Jerez, Spain]	Not applicable. This section was rewritten and substantially shortened. Regional projections are no longer referred to. Will consider if relevant to be included in the Annex prior to publication.
54366	31	33	31	33	I would replace the sentence by "In addition, there are systematic discrepancies in downwelling surface shortwave radiation projections from regional vs. global climate models in Europe, possibly due to differences in aerosol concentrations assumptions (Bartók et al., 2017). [Robert Vautard, France]	Not applicable. This section was rewritten and substantially shortened. Regional projections are no longer referred to. May consider for inclusion in the Annex prior to publication
19162	31	34	31	34	Another caveat that could be underlined at this point is that Regional Climate Models (RCMs), when used to downscale climate information, should include and handle the estimated evolution of the atmospheric concentrations of Greenhouse Gases (GHG), which is a non-regulated, non-documented and non-evident practice. A recent paper by Jerez et al. calls the attention on this issue: on the lack of coordination and information at this regard within the regional climate modeling community. This study demonstrates that RCM simulations performed with constant values of the atmospheric concentrations of GHG provide less intense warming signals (up to a half under 1.5ºC global warming conditions) than when the RCM setup includes the evolving GHG forcing. REF: Jerez, S., López-Romero, J.M., Turco, M., Jiménez-Guerrero, P., Vautard, R., and Montávez, J.P. (2018). Impact of evolving vs. constant GHG forcing in regional climate modeling evidenced from the warming signal. Nature Communications, in press. [Sonia Jerez, Spain]	Not applicable. This section was rewritten and regional material was moved to the Annex.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16008	31	36	31	42	A clear statement on whether the findings described in this paragraph are consistent or contrary to the largest warmings for transitional regions described on p31, lines 1-11. It may also help to move this content nearer to lines 1-11 so the magnitude of warming in different regions is dicussed together, before ranges of uncertainty. [Australia]	Not applicable. This section was substantially rewritten and shortened.
50836	31	38	31	38	.....'drylands' and 'humid' lands.... instead of "....'dry' and 'humid' lands...." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
484	31	39	31	39	lower than 600 mm should be "lower than 600 mm per year?" [Taoyuan Wei, Norway]	Not applicable. This section was rewritten. This text was moved to the Annex. Will check if this is correctly referred to in the Annex prior to publication
28228	31	39	31	39	600 mm/year ? [Germany]	Not applicable. This section was rewritten. This text was moved to the Annex. Will check if this is correctly referred to in the Annex prior to publication
6490	31	40	31	40	identifies that warming' should be 'indicates that warming' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
54292	31	40	31	42	What are the origins of the GHG emissions referred to here? [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable. This text was removed.
16010	31	41	31	42	The statement about contributions to emissions here seems irrelevant to the discussion and can probably be removed. [Australia]	Not applicable - This section was rewritten
41534	31	41	31	42	delete: that underlie this change [Sergio Aquino, Canada]	Not applicable - This section was rewritten
3498	31	45	31	46	I do not agree with this statement. The discrepancy of TNn with global levels of warming is higher compared to TXx. If you look at the global land plot of Fig. 3.9, the ratio between Delta TNn and Delta Tglob is around 2 (and not 1). [David Docquier, Belgium]	Not applicable. This text is no longer included.
30448	31	47	31	48	This explanation is false, since TNn generally happens in the middle of winter and during nighttime when incoming solar radiation is very low. The regions with the largest differences are those above the ocean or relatively close to the ocean, showing that it is mainly due to changes in sea-ice coverage in winter, i.e regions where sea-ice wll not occur or will occur later in winter compared to present conditions.The strong decrease in the number of frost days over the NH polar oceans in Fig 3.10 corroborates this explanation. [France]	Not applicable. This text is no longer included.
61842	31	47	31	48	Please refer to the IPCC AR5 WGI box on polar amplification (located in chapter 5). Arctic amplification is not only caused by snow albedo temperature feedbacks, so please provide either a comprehensive assessement with state of the art references or just refer to the AR5 assessment. Moreover, the discussion is not physically correct, as the discussion here is on the amplified minimum temperature warming (which is not exactly night time temperature in the Arctic given the duration of day/night in this region). [Valérie Masson-Delmotte, France]	Accepted. The text now mentions polar amplification and refers to chapter 5 of the IPCC AR5 WG1 on this point
41476	32	1	43	17	They need to explain on the mechnaisms of increasing in heavy precipitation in South Africa here. [Izuru Takayabu, Japan]	Rejected. Too detailed.
3494	32	3			Figure 3.9: Is there any difference between the map of this figure and the last panel of Fig. 3.5? If not, consider removing the latter. [David Docquier, Belgium]	Noted. Figure has been moved to the Annex. Map in the middle of the figure is different, because it has been computed for the HAPPI simulations not for the CMIP5 experiments.
3496	32	3			I would use the same colorbar range for the map as the one in Fig. 3.8 to make a comparison easier (as in Fig. 3.5 for example). [David Docquier, Belgium]	Not applicable. The previous Fig. 3.9 has been moved to the Annex. However, will consider changing the colour bar to make it consistent with the figure for TXx (now Fig. 3.5) prior to publication.
3500	32	3			Figure 3.9: Wouldn't it be more interesting to plot 'Delta TNn / Delta Tglob' instead of 'Delta TNn' for the map? It would show the change of annual min nighttime temperature per degree warming. This ratio seems to be around 2 for the global land, meaning that TNn increases more rapidly than Tglob. [David Docquier, Belgium]	Not applicable. Figure is no longer included.
35056	32	4	33	3	Figure caption is long and not clear [Shaukat Ali, Pakistan]	Not applicable - This figure was deleted
43218	32	4	32	4	Figure legend and axes text could be bigger [Edward Byers, Austria]	Not applicable. Figure is no longer included.
21778	33	1			insert space between "2007)together" [LUIS VALDES, Spain]	Not applicable - This figure was deleted
21780	33	1			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This figure was deleted
41588	33	1			Fig 3.10 - One picture and four different scales for number of days. It is confusing. [Czech Republic]	Noted. Figure for number of frost days was removed.
44338	33	1	33	1	Space is missing "et al., 2017)together with projected" [Rita Man Sze Yu, China]	Not applicable - This figure was deleted
50838	33	1	33	1	....Wartenburger et al., 2017) together.... instead of "...Wartenburger et al., 2017)together.... [Amjad Masood, Pakistan]	Not applicable - This figure was deleted
7088	33	3			After Seneviratne et al. - year? [Dmitry L. Musolin, Russian Federation]	Not applicable - This figure was deleted
39658	33	3	33	3	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Not applicable - This figure was deleted
49358	33	3	44	24	It is essential to discuss discuss in more details the enegry efficiency and a thorough analysis between the fossil fuels and the renewables [Spyros Schismenos, China]	Rejected. This does not belong in this chapter.
16012	33	5	33	19	Presumably Figure 3.10 show ensemble means changes from CMIP5. This needs to be stated in the text and figure captions, together with the number of models used in the analysis. [Australia]	Yes, results are based on CMIP5 mean changes. Should be clear from the text and Annex. Will check if additional background information may be necessary on this in the Annex prior to publication. Number of models may be too much information and can be found in underlying publication (Wartenburger et al. 2017)
16014	33	5	33	19	The definitions of number of hot days and number of frost days needs to be clearly descirbed in the text. [Australia]	Rejected. Figure for number of frost days has been removed. Number of hot days is a well defined index, already used in prior IPCC report. Will consider prior to publication is some additional background material may be useful in the Annex.
16016	33	5	33	13	This paragraph should mention whether the results stated are true of all / most CMIP5 GCMs. [Australia]	Rejected. Results are consistent across models as can be seen from the right-hand figure. Will consider also including some hatching/stippling for the left-hand figures prior to publication.
50840	33	5	33	5	Number of Hot Days (NHD) and Number of Cold Days (NCD) instead of number of hot days (NHD) and number of cold days (NCD)" [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
117	33	6	33	6	global mean temperature warming to be changed "global mean temperature increase" [teodoro georgiadis, Italy]	Noted. This can be fixed prior to publication (in caption of new Fig. 3.5)
16018	33	6	33	7	It is worth stating that the patterns of change between the two warming levels are broadly similar, but the magnitudes of change are greater for 2C global warming. [Australia]	Rejected. Seems obvious. But can be added prior to publication if considered critical.
50980	33	6	36	7	The regions cited include the IPCC SREX regions and also some other few subregions like southern Europe (for example) which is already included in the MED region. If the choice is to cite also subregions, please do not be exclusive; As a sample: North Africa is at least concerned as much as Southern Europe by the warming and extreme temperatures. This comment is also valid for other subregions/regions through the chapter [Fatima Driouech, Morocco]	Noted. In the mentioned figure, only the SREX regions are considered.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16020	33	7	33	9	This sentence is unclear. Are the differences being referred to changes between recent and 1.5C/2C climates or differences between changes for 1.5C and changes for 2C? What kind of differences can be largest in the tropics but be higher in absolute terms in the mid-latitudes? Is the phrase "largest differences" appropriate? Perhaps "most significant changes" would be better? [Australia]	Rejected. The statements apply both to the differences between changes at 1.5 and 2 and the recent climate (or pre-industrial time) as well as for differences between 1.5 and 2. The absolute changes in temperatures (i.e. in degrees) are larger in the mid-latitudes, but because the variability is smaller in the tropics, the extremes of recent climate distributions are exceeded more quickly in the tropics.
28230	33	7	33	8	Based on results shown in Figure 3.10 we would suggest adding "and subtropics". [Germany]	Noted. The signal is stronger in the tropics, but could add "(and part of the subtropics)" prior to publication.
30450	33	7	33	9	« lower interannual temperature variability » Would it not be better to invoke the lower annual amplitude of daily temperature? [France]	Rejected. Txx always happen in the summer, hence it is not a matter of annual amplitude but a matter of interannual climate variability.
12024	33	10	33	13	Can you rephrase "highly unusual monthly temperatures" as it's not clear what this means. [United Kingdom (of Great Britain and Northern Ireland)]	Rejected. It means "very extreme/rare".
16022	33	10	33	13	This sentence is unclear. Does "centered in low latitude regions" mean "mainly in low latitude regions"? Can more specific definitions of "highly unusual" and "regular basis" be provided? [Australia]	Noted. Text will be further clarified prior to publication.
32468	33	10	33	13	… is projected to experience unusual monthly temperatures…are projected : missing a word. Maybe "and"? [Rosanne Martyr-Koller, Germany]	Accepted - Sentence was revised
49132	33	10	33	13	This sentence does not make sense and needs to be rephrased [Bill Hare, Germany]	Accepted - Sentence was revised
16024	33	11	33	13	This sentence does not make sense. [Australia]	Accepted - Sentence was revised
6492	33	12	33	12	are' should be 'and are' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
29426	33	12	33	13	Please review writing. The text after the bracket does not make sense. Some word like "and" is missing. [Joan A. Lopez-Bustins, Spain]	Accepted - Sentence was revised
56284	33	12	33	12	Rephrase. [Annika Herbert, Australia]	Accepted - Sentence was revised
1372	33	14	33	15	This is a good figure. The question is: how many of these figures are really needed to get the gist of it? [Karen Olsen, Denmark]	Accepted. Figure was moved to the Annex.
6188	33	14	33	15	This is a good figure. The question is: how many of these figures are really needed to get the gist of it? [Anne Olhoff, Denmark]	Accepted. Figure was moved to the Annex.
7206	33	14	33	15	It seems counterintuitive to use red tones for frost days. Blue? [Petra Tschakert, Australia]	Not applicable. This figure was removed.
16026	33	14	33	19	It might be possible to remove the middle panels of Figure 3.10 to save some space. [Australia]	Accepted. The figure was revised.
16028	33	14	33	19	The hatching in Figure 3.10 is not particularly informative. Hatching showing model agreement on the magnitude of the 2C-1.5C warming difference would be more useful. [Australia]	Rejected. More important to assess whether 2/3 of models agree on significant change in temperature conditions at 1.5 vs 2, magnitude is less relevant.
16030	33	14	33	19	The logic of placing Figures 3.5 and Figures 3.10 at different places in the chapter is unclear. [Australia]	Noted, not critical for material. Previous Fig. 3.5 is include in the global chapter because it is used to discuss general features of changes in temperature and precipitation. More detailed aspects are treated in Sections 3.3.2. and 3.3.3
18274	33	14	33	15	This is a good figure. The question is: how many of these figures are really needed to get the gist of it? [Andrea TILCHE, Belgium]	Accepted. Figure was moved to the Annex.
17320	33	16	33	16	10% warmest days in the caption of the figure is without context until a later section of the text. Not clear what it means here. [David Schoeman, Australia]	Rejected. This definition of hot days is well established in the climate literature and was already used in past IPCC reports.
44934	33	16	33	16	10% warmest days': What 10% mean? 10% of which value? [Hiroaki Kondo, Japan]	90th percentile. Will consider clarifying this in the text prior to publication.
28232	33	17	33	17	The panel for 2°C is shown in the middle not on the right, please revise. [Germany]	Accepted. The figure caption was revised.
7090	33	24			After Seneviratne et al. - year? [Dmitry L. Musolin, Russian Federation]	Accepted - Year was added
12826	33	24			The reference to Senviratne et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Accepted - Year was added
16032	33	24	33	24	Refer to figure S3.8 in Annex 3.1 - ideally the region definitions would not require opening a different document - suggest adding the 3 letter labels for SREX regions to Figures 3.8, 3.9, 3.12 … OR use the region numbers from these figures in the column headings of figures 3.11 and 3.13 [Australia]	Accepted - Sentence was revised
39660	33	24	33	24	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Accepted- year was added.
44340	33	24	33	24	Year is missing "(Seneviratne et al.)" [Rita Man Sze Yu, China]	Accepted- year was added.
50842	33	24	33	24	year of publication is missing in reference "Seneviratne et al...." [Amjad Masood, Pakistan]	Editorial. Year was added.
51090	33	24	33	24	The precision that the regions used are those of IPCC SREX is given several times in the chapter, it is better to explain it once in the beginning of the chapter and avoid repetition [Fatima Driouech, Morocco]	Accepted. This is now done in the FGD.
62334	33	24	31	24	Please, verify this reference "(Seneviratne et al.)"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Year was added
3502	34	1	34	4	Although it is true that these indices are not significant for all regions, it is only DTR which is really not significant over the whole world. The other indices are more significant than not over the different regions. I think it should be stated. [David Docquier, Belgium]	Rejected. DTR changes are significant for the global land. Results have been highlighted separately for the different indices.
7882	34	1	34	21	TN90p and TX90p are very sensitive to local influence, proximity to ocean or sea tend to decrease intensity of warm extremes. Sea breeze during the end of summer day decrease the value of TX and the number of tropical nights. It was more appreciated to add some results of Regional Climate Model in order to downscale global models outputs and assess the reliability of results at local scales. [khadija kabidi, Morocco]	Rejected. Analyses of TN90p and TX90p were commonly provided in previous IPCC reports and in the climate literature.
12026	34	1	34	12	This paragraph could be condensed for brevity e.g. "Based on these analyses, the intensity, frequency and duration of warm extremes over land regions increases at 2°C vs. 1.5°C, while cold extremes become shorter, less intense, and less frequent." [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Will consider updating text to include this summarizing sentence prior to publication.
49134	34	1	34	12	For which period are the percentiles calculated? [Bill Hare, Germany]	For the pre-industrial time period (1861-1880 in the underlying publication). Will add this information in the caption prior to publication.
54304	34	1	34	4	Is it the case for some of these indices that the lack of difference is due to the characteristics of the index e.g. small shift to year round 'growing season'? If so, perhaps this could be mentioned to explain why they are exceptional i.e. that it is due to how some of the indices are defined. [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Would be too detailed.
1374	34	13	34	21	Not useful: delete the figure [Karen Olsen, Denmark]	Rejected. Other reviewers found this figure useful (e.g. comment #3504).
6190	34	13	34	21	Not useful: delete the figure [Anne Olhoff, Denmark]	Rejected. Other reviewers found this figure useful (e.g. comment #3504).
16034	34	13	34	21	Figure 3.11 summarises the signficance of differences between projections for 1.5C and projections for 2.0C. It is not clear why a similar figure summarising significance of changes between the recent climate and 1.5C global warming is not included. [Australia]	Noted. Will consider including such a figure in the Annex prior to publication.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16036	34	13	34	21	Interpretation of Figure 3.11 would be a lot easier if abbreviation for extreme indices and regions were expanded in the figure itself or in accompanying tables/map. Interpretation would also be aided if more pronounced cell borders were used between groups of similar indices (e.g. min. temps, max. temps) or adjacent regions. It would also be helpful to indicate whether some indices are zero in any regions (e.g. ice days) as this changes the interpretation of zero difference between 2C and 1.5C projections. [Australia]	Noted. Indicating whether some indices are zero in some regions would indeed be useful. Will be considered for inclusion prior to publication.
16038	34	13	35	7	This figure is not useful. In particular the three-letter region codes are not defined. [Australia]	Rejected. Other reviewers found this figure useful (e.g. comment #3504).
18276	34	13	34	21	Not useful: delete the figure [Andrea TILCHE, Belgium]	Rejected. Other reviewers found this figure useful (e.g. comment #3504).
30452	34	13	35	7	Figure 3.11 : The name of the considered regions should be included in the caption for making the Figure self understandable [France]	Accepted. Will a note in the caption prior to publication that the region abbreviations can be found in Figure 3.15
49872	34	13	34	21	This figure is not very good as it is not easy to read. There are too many details and it is difficult to see what is written in it (the font sizes for the indices and regions is small) and having to switch between figure and figure caption to understand what is shown is difficult. Also, why is it interesting to show Frost days for Amazonia? Finally, what is the definition of all these indices and where can the areas be seen? [Erik Kjellström, Sweden]	Rejected. Other reviewers found this figure useful (e.g. comment #3504). However, more details on the computation of the indices will be included in the Annex prior to publication. Regions with no frost days will be indicated in the figure prior to publication.
52618	34	13	34	14	Would suggest revising Figure 3.11 (and other related and similar tables) by having boxes with negative signs (other than those denoted by grey) representing -ve differences, be denoted by a different colour to the red ones (in a colour blind firendly scheme) to make the -ve vs +ve more immediately visible, thus providing bettercontrasts between decreases and increases. [Charlotte Roehm, United States of America]	Rejected. Decided to highlight all changes consistent with warming in red (e.g. decrease in cold spell duration index is consistent with warming). Highlighting them in blue might give the wrong impression that some changes are rather consistent with cooling.
57594	34	13	48	32	Figures 3.11, 3.13, and 3.16 should definitely be moved to the Supplementary Online Material [Hans Poertner, Germany]	Rejected. These figures entail a lot of essential information, as they summarize the sign of change for all indices and regions.
3504	34	14			Figure 3.11: A suggestion to improve this interesting figure is to color significant negative signs in blue (rather than the same color as for significant positive signs, which would stay in the original color). [David Docquier, Belgium]	Rejected. Decided to highlight all changes consistent with warming in red (e.g. decrease in cold spell duration index is consistent with warming). Highlighting them in blue might give the wrong impression that some changes are rather consistent with cooling.
7888	34	16	34	21	Threshold used to describe warm and cold spell should reflect local variability. [khadija kabidi, Morocco]	Do not understand comment
49136	34	16	35	7	It would be handy to repeat here the reference period used to calculate the percentiles [Bill Hare, Germany]	Accepted. Will add the reference period in the caption prior to publication
61844	34	16	34	20	For these synthesis figures (here and subsequent ones), make sure that the key findings are used in the summaries of sections and in the executive summary. [Valérie Masson-Delmotte, France]	Accepted. Have used these analyses more strongly in the final assessments.
60368	35	1	67	1	Most topics are important but coverage needs to be drastically shortened, keeping in mind the points that need to be highlighted to the reader. This refers to sections excluding the Paleontological box (box 3.4) [United States of America]	Noted. Text was made more focused.
29428	35	4	35	6	What does it mean when no sign is displayed? For instance, ID AMZ. [Joan A. Lopez-Bustins, Spain]	Noted. We agree that it would be better to not show any colour for indices that are zero (ice days) or at its absolute maximum (growing season length) at both 1.5°C and 2°C GMST. This will be considered as a possible modification prior to publication.
35058	35	4	35	7	A more brief caption can be insetred. The ending lines can be suumarized as: Increase is indicated with + sign, decrease with - sign, insignificant differences with gray shading. [Shaukat Ali, Pakistan]	Rejected. This does not essentially shorten the caption and it does not explicitly indicate that red shading indicates significant differences.
21782	35	5			In statistical language the right term is "non-statistically significant" which is different from "insignificant" (avoid the use of this term... it is not correct) [LUIS VALDES, Spain]	Accepted. Changed.
17322	35	7	35	7	Delete the additional space after "1995" [David Schoeman, Australia]	Accepted. Space deleted.
62336	35	7	35	7	Instead of writing "Benjamini and Hochberg (1995) (adapted from Wartenburger et al., 2017).", please write "Benjamini and Hochberg (1995; adapted from Wartenburger et al., 2017)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
7884	35	9	35	16	Is the effect of UHI and urban expansion on the increase of heat stress extremes is similar for all countries? it was more appreciated to add results from studies to assess the effect of UHI on emergent and less developed countries. Results will lead to more reliable results and analyses about the benefits of decreasing global warming to 1.5 °C. [khadija kabidi, Morocco]	Not applicable - The text on UHI has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
49138	35	9	35	45	This paragraph is about temperature extremes and thus there is no point mentioning changes in the water cycle (line 14 and line 43) in here. Since they are additional risk factors that can enhance the risk caused by rising temperatures on urban populations, they can be mentioned in Section 3.4.7 on health or Section 3.4.8 on urban areas [Bill Hare, Germany]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
61846	35	9	35	45	Move to a box on cities together with other relevant elements. I suggest to use the latest knowledge and provide an exhaustive assessment for instance related to adaptation with albedo of roofs and surfaces (the cited references are from 2009 and 2010). This appears somehow superficial here. [Valérie Masson-Delmotte, France]	Noted - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11). Text from Section 3.4 will be checked and if relevant new publications on albedo of roofs and surfaces will be referenced there prior to publication.
5590	35	10	35	10	. A small number of studies have used km-scale regional climate models ?to investigate this for selected cities (Argüeso et al., 2014; Conlon et al., 2016; Georgescu et al., 2012; ?Grossman-Clarke et al., 2017; Kusaka et al., 2016)." Don't you think that it could be interesting to point out that may be it would be interesting to make studies on a more accurate scale as brobably there will be small areas which could have their own microclimatic niche peculiarity….whit higher extreme?temperature…and to detect these microniche the scale geographical scale should be much more detailed than what has been investigated until now. [Sandra CASSOTTA, Denmark]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
21784	35	10			Remove space between "used km-scale" [LUIS VALDES, Spain]	Not applicable - This text was deleted
39662	35	12	35	13	I would replace the original sentence by this shorter one: "In general, these studies find that the UHI remains in a future warmer climate with higher intensity due to increases in population and city size." [Hernan Edgardo Sala, Argentina]	Accepted. This paragraph was moved to another section and revised.
49140	35	12	35	13	Socio-economic and climatic factors are not clearly separated in this sentence. [Bill Hare, Germany]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
53080	35	12	35	12	I suspect projecting changes in UHI intensity will involve high uncertainties given possible complex interactions between landuse change, population increase, temperature, humidity, wind, and new buildings, more public transport system than private cars, hybrid cars, etc. [Thian Gan, Canada]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
41538	35	15	36	15	correct temperatures [Sergio Aquino, Canada]	unclear what this comment refers to

Comment No	From Page	From Line	To Page	To Line	Comment	Response
43612	35	15	35	15	Line 15: One more reference to support this statement (Hong and Hong, 2016) [Jinkyu Hong, Republic of Korea]	heat wave versus heat-wave still inconsistent in Ch3. E.G.: 3.5.5.8 in title: heat-wave versus heat wave in the text of 3.3. Also heatwaves is used in CH3.
56620	35	15	35	16	could add some more evidence that where people live is crucial (& of the same order of magnitude as a 1.5 vs 2 degree change) for heat exposure http://iopscience.iop.org/article/10.1088/1748-9326/aaaa99 [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
1376	35	18	35	45	Important information but should be presented in urban area section [Karen Olsen, Denmark]	Accepted. Text was donated to Section on urban impacts
6192	35	18	35	45	Important information but should be presented in urban area section [Anne Olhoff, Denmark]	Accepted. Text was donated to Section on urban impacts
18278	35	18	35	45	Important information but should be presented in urban area section [Andrea TILCHE, Belgium]	Accepted. Text was donated to Section on urban impacts
28234	35	18	35	31	The term "deadly heatwaves" should be explained in the text or rephrased. [Germany]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
35888	35	18	35	31	The following references may be considered for inclusion, if appropiate- Mishra, V*., S. Mukherjee, R. Kumar, and D. Stone, 2017: Heat wave exposure in India in current, 1.5 degree C, and 2.0 degree C worlds. Environ. Res. Lett. [India]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
39664	35	18	35	18	I suggest to use "heat-waves" instead of "heatwaves" to keep consistency along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	heat wave versus heat-wave still inconsistent in Ch3. E.G.: 3.5.5.8 in title: heat-wave versus heat wave in the text of 3.3. Also heatwaves is used in CH3.
39666	35	22	35	22	I suggest to use "heat-waves" instead of "heatwaves" to keep consistency along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	heat wave versus heat-wave still inconsistent in Ch3. E.G.: 3.5.5.8 in title: heat-wave versus heat wave in the text of 3.3. Also heatwaves is used in CH3.
40204	35	23	35	31	In Egypt, mortality due to heat stress are expected to rise; especially in megacities such as Cairo, among vulnerable infant and elders. Reference: Tolba MK and Saab NW (2009) Arab Environment :Climate change -Impact of climate change on Arab countries 2009 .Report of the Arab Forum for Environment and Development [Amal Hussein, Egypt]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
31052	35	33	35	35	the study by Mitchell et all assumes no adaptation and constant vunerability - to be honest these assumptions mean the study holds limited insights as they are unreasonable assumptions. [James FORD, Canada]	Not applicable - The text on urban heatwaves has been donated to Section 3.4 (note that this comment was erroneously assigned to Fig. 3.11)
12828	35	35			The reference to Mitchell et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Accepted. Paragraph was moved to another section and the year was added.
12830	35	35			The reference to Jacob et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Accepted. Paragraph was moved to another section and the year was added.
19344	35	35			references Michell et al. and Jacob et al. missing year [Aristeidis Koutroulis, Greece]	Accepted. Paragraph was moved to another section and the year was added.
32470	35	35	35	35	Citations are missing years. [Rosanne Martyr-Koller, Germany]	Accepted. Paragraph was moved to another section and the year was added.
35060	35	35	35	35	Year of study is missing with citation of studies by Mitchell et al., Jacob et al., [Shaukat Ali, Pakistan]	Accepted. Paragraph was moved to another section and the year was added.
35890	35	35	35	35	Incomplete references for Mitchell et al as well as Jacob et al. Add complete reference [India]	Accepted. Paragraph was moved to another section and the year was added.
39668	35	35	35	35	Add "submitted" or the year of publication to "Mitchell et al." and "Jacob et al.". [Hernan Edgardo Sala, Argentina]	Accepted. Paragraph was moved to another section and the year was added.
44342	35	35	35	45	Year is missing in several references [Rita Man Sze Yu, China]	Accepted. Paragraph was moved to another section and the year was added.
49142	35	35			Years of publication are missing for the cited references [Bill Hare, Germany]	Accepted. Paragraph was moved to another section and the year was added.
50844	35	35	35	35	year of publication is missing in reference "Jacob et al...." [Amjad Masood, Pakistan]	Accepted. Paragraph was moved to another section and the year was added.
62338	35	35	35	35	Please verify this reference "Mitchell et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Paragraph was moved to another section and the year was added.
12832	35	39			The reference to Mitchell et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Accepted. Paragraph was moved to another section and the year was added.
35892	35	39	35	39	Incomplete references for Mitchell et al. Add complete reference. [India]	Accepted - Sentence was revised
39670	35	39	35	39	Add "submitted" or the year of publication to "Mitchell et al." [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
62340	35	39	35	39	Please verify this reference "Mitchell et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Sentence was revised
12834	35	41			The reference to Pfeifer et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
12836	35	41	35	44	This sentence's meaning is hard to understand, the verb seems to be in the wrong tense. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
19342	35	41			Add year of publication to Pfeifer et al. [Aristeidis Koutroulis, Greece]	Not applicable - This text was deleted
21786	35	41			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This text was deleted
28236	35	41	35	44	The term "people at risk" should be explained in the text and "increasing number" should be quantified. [Germany]	Not applicable - This text was deleted
35062	35	41	35	41	Year of study is missing with citation of studies by Pfeifer et al. [Shaukat Ali, Pakistan]	Not applicable - This text was deleted
39672	35	41	35	41	Add "submitted" at the end of "Pfeifer et al." [Hernan Edgardo Sala, Argentina]	Not applicable - This text was deleted
40206	35	41	35	41	Please add the year to the reference "Pfeifer et al.," [Amal Hussein, Egypt]	Not applicable - This text was deleted
50846	35	41	35	41	year of publication is missing in reference "Pfeifer et al., ..." [Amjad Masood, Pakistan]	Not applicable - This text was deleted
3506	35	42			Replace 'increasing' by 'increase in'. [David Docquier, Belgium]	Not applicable - This text was deleted
6494	35	42	35	42	find an increasing the number of' should be 'find an increasing number of' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
44344	35	42	35	42	an increasing the number of people [Rita Man Sze Yu, China]	Not applicable - This text was deleted
46056	35	42	35	42	also find an increasing the number, should be either "find an increasing number" or "find increasing the number". [Justin Oogjes, Australia]	Not applicable - This text was deleted
56286	35	42	35	42	Change "increasing" to "increase in". [Annika Herbert, Australia]	Not applicable - This text was deleted
17324	35	43	35	43	What is a "tropical night", and why bring in precipitation here…the paragraph is about temperature? [David Schoeman, Australia]	Not applicable - This text was deleted
29430	35	43	35	43	It would be valuable to include a short definition of tropical night in brackets (e.g. TN>20ºC) [Joan A. Lopez-Bustins, Spain]	Not applicable - This text was deleted
275	35	44	35	44	.....density. (SPACE) Downscaling results..... [Paul Doyle, Canada]	Not applicable - This text was deleted
7514	35	44	35	44	…density. Downscaling results… [Jens Zinke, Germany]	Not applicable - This text was deleted
16040	35	44	35	45	It is not clear what aspect of near surface atmospheric temperature above 28C is different (e.g. Areal extent of climatological mean daily max temp above 28C? Frequency of occurrence of temps above 28C?). [Australia]	Not applicable - This text was deleted
16042	35	44	35	45	It is not clear why this sentence is in a discussion on urban heat. Is the 28C statistic related to cities in Europe in some way? [Australia]	Not applicable - This text was deleted
21788	35	44			insert space between "density.Downscaling" [LUIS VALDES, Spain]	Not applicable - This text was deleted
24142	35	44	35	44	…density.Downscaling… Break space after full stop. [Mustafa Tufan Turp, Turkey]	Not applicable - This text was deleted
28238	35	44	35	45	The meaning of "distinct difference in near surface atmospheric temperature above 28°C" is not clear; please reformulate. [Germany]	Not applicable - This text was deleted
39674	35	44	35	44	Insert a space after the point in: "density.Downscaling" [Hernan Edgardo Sala, Argentina]	Not applicable - This text was deleted
50848	35	44	35	44	density. Downscaling... instead of "density.Downscaling..." [Amjad Masood, Pakistan]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61850	35	44	35	45	I do not understand the relevance of the last sentence (a distinct difference in near surface atm. Temp. Above 28°C with 0.5°C more warming". This reads like an extract of a paper rather than an assessment. [Valérie Masson-Delmotte, France]	Not applicable - This text was deleted
12838	35	45			The reference to Sieck is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
21790	35	45			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This text was deleted
39676	35	45	35	45	The year of publication is missing in "Sieck" [Hernan Edgardo Sala, Argentina]	Not applicable - This text was deleted
50850	35	45	35	45	year of publication is missing in reference (Sieck) [Amjad Masood, Pakistan]	Not applicable - This text was deleted
62342	35	45	35	45	Please verify this word "(Sieck)"; is it a reference? [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This text was deleted
1378	36	1	36	20	The fact that there is a subsection summary indicates that there is too much information presented before - delete [Karen Olsen, Denmark]	Rejected. Summary section was removed, but summary paragraphs were included in FGD. This is not a review but an assessment. The summary paragraph allow to provide a traceability of the statements from the executive summary.
6194	36	1	36	20	The fact that there is a subsection summary indicates that there is too much information presented before - delete [Anne Olhoff, Denmark]	Rejected. Summary section was removed, but summary paragraphs were included in FGD. This is not a review but an assessment. The summary paragraph allow to provide a traceability of the statements from the executive summary.
16044	36	1	36	20	Comparisons between projections for 1.5C and 2C would more appropriately be placed in paragraph at the end of this summary, with most of the summary dedicated to the projections for 1.5C themselves. [Australia]	Rejected. Both the projections at 1.5 as well as the comparisons with 2°C constitute the core of the assessment.
18280	36	1	36	20	The fact that there is a subsection summary indicates the information presented before could be communicated more concisely. [Andrea TILCHE, Belgium]	Rejected. Summary section was removed, but summary paragraphs were included in FGD. This is not a review but an assessment. The summary paragraph allow to provide a traceability of the statements from the executive summary.
40212	36	1	36	20	It will be more suitable to write in the summary something about the health impacts inform of "increase deaths from heat stress, and the expectations of more increase especially in megacities". [Amal Hussein, Egypt]	Not applicable - This text was deleted
61852	36	1	36	20	I suggest not to cite references in summaries or key conclusions, but a use of the calibrated IPCC language. Valid for other summaries. [Valérie Masson-Delmotte, France]	Accepted. This was done in the revised summary.
16046	36	2	36	2	It is not clear to us how the text can make the statement "there are statistically significant differences in temperature means and extremes at 1.5°C vs 2°C" without some explanation of how statistical significance is defined and detected in modelled outputs as opposed to observation data sets. Neither the 1.5C nor the 2C warmer worlds have occurred yet so there's no data; this requires some contextualisation for readers in the policy space. [Australia]	Rejected. The underlying data are model simulations. The confidence assessment indicate the level of certainty in these assessments.
16048	36	2	36	4	It would seem more appropriate for the first sentence of the summary to be about the magntiude of changes under 1.5C global warming rather than a comparison of changes under 1.5C and changes under 2C. [Australia]	Rejected. Comparison to 2°C is an essential part of the assessment. But it will be considered prior to publication whether a sentence on changes in climate at 1.5°C may be added as first summary sentence.
21792	36	4			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
35894	36	4	36	4	Incomplete references for Seneviratne et al. Add complete reference [India]	Not applicable - This section was rewritten
39678	36	4	36	4	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44346	36	4	36	4	Year is missing "(Seneviratne et al.;" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
50852	36	4	36	4	year of publication is missing in reference "Seneviratne et al...." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
62574	36	4	36	4	Please verify this reference "Seneviratne et al."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
16050	36	5	36	5	exaggerated relative to what? [Australia]	Not applicable - This section was rewritten
16052	36	6	36	7	Australia should be included in this list. For example, Perkins, S. E., D. Argüeso, and C. J. White (2015), Relationships between climate variability, soil moisture, and Australian heatwaves, J. Geophys. Res. Atmos., 120, 8144–8164, doi:10.1002/2015JD023592. [Australia]	Rejected. The assessment does not support that the signal is as robust there as in the other highlighted regions (see e.g. Fig. 3.5 in the FGD).
50984	36	6	37	16	Fig 3.6, hilights severl regions with important change in precipitation, please include this in the analysis within this regional fremework. For example: the meditterranean, north Africa, south Africa, Australia, ... It is important to give a broader idea than only for a certain case/region [Fatima Driouech, Morocco]	Noted. We have revised the text and have focused more on regional aspects. See in particular for the projections the discussion of the Fig. 3.11 in the FGD.
49874	36	9	36	9	Should be "responses to warm temperature extremes"? [Erik Kjellström, Sweden]	Not applicable - This section was rewritten
16054	36	10	36	12	It does not seem appropriate to comment on a specific extreme temperature index in the summary. [Australia]	Rejected. This is a measure of a kind of hot extremes.
16056	36	10	36	10	Please quantify the change in extremes between the two scearios [Australia]	Rejected, too detailed.
30454	36	10	36	12	« low interannual temperature variability » Would it not be better to invoke the lower annual amplitude of daily temperature? [France]	Rejected. The hot days are defined for each calendar day separately.
12840	36	11			…between 1.5 and 2.0°C… there should be "°C" after "1.5" [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
12842	36	11			… between 1.5 and 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
49876	36	13	36	14	I think it should be spelled out that changes in cold extremes are larger than those in warm extremes [Erik Kjellström, Sweden]	Rejected, too detailed. In addition, this statement is not valid everywhere.
16058	36	14	36	20	The discussion of urban heat would best be placed in a separate paragraph. [Australia]	Accepted. Urban heat was moved to another section.
41330	36	14	36	15	It is understood that all assessments here are based on published, peer-reviewed papers, it isthus suggested that the phrase "published literature" not be used. [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
7516	36	15	36	15	..2 C degree symbol missing [Jens Zinke, Germany]	Not applicable - This section was rewritten
12844	36	15			…warming to 1.5°C and 2.0 C on cities… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
24144	36	15	36	15	…2.0 C… ---> "…2.0 ?…" [Mustafa Tufan Turp, Turkey]	Not applicable - This section was rewritten
44936	36	15	36	15	2.0 C--> 2.0oC [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
50856	36	15	36	15	2.0oC instead of "2.0C" [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
12846	36	16			The reference to Mitchell et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
39680	36	16	36	16	I suggest to use "heat-waves" instead of "heatwaves" to keep consistency along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	heat wave versus heat-wave still inconsistent in Ch3. E.G.: 3.5.5.8 in title: heat-wave versus heat wave in the text of 3.3. Also heatwaves is used in CH3.
50854	36	16	36	16	year of publication is missing in reference "Mitchell et al. [Amjad Masood, Pakistan]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62344	36	16	36	16	Please verify this reference "Mitchell et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
7518	36	17	36	17	…1.5 to 2C.. degree symbol missing [Jens Zinke, Germany]	Not applicable - This section was rewritten
12848	36	17			…warming of 1.5 and 2.0 C… there should be ""C" after "1.5" [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
12850	36	17			…warming of 1.5 and 2.0 C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
24146	36	17	36	17	Add the reference year of Mitchell et al. [Mustafa Tufan Turp, Turkey]	Not applicable - This section was rewritten
40208	36	17	36	17	the temperature was written wrong "2.0 C" the correct is "2°C" [Amal Hussein, Egypt]	Not applicable - This section was rewritten
41536	36	17	36	17	correct temperatures [Sergio Aquino, Canada]	Not applicable - This section was rewritten
44938	36	17	36	17	2.0 C--> 2.0oC [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
12852	36	19			The reference to Jacob et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
12854	36	19			The reference to Mitchell et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
14170	36	19	36	22	"Seneviratne et al." Incomplete citation. [Rongshuo Cai, China]	Not applicable - This section was rewritten
19346	36	19	36	20	references Michell et al. and Jacob et al. Pfiefer et al. missing year (Jacob et al., is missing year of publication in several sections) [Aristeidis Koutroulis, Greece]	Not applicable - This section was rewritten
24148	36	19	36	20	Years of the references are missing! [Mustafa Tufan Turp, Turkey]	Not applicable - This section was rewritten
40210	36	19	36	20	the references "(Jacob et al.; Mitchell et al.; Pfeifer et al.)" were written without the years, please add the missed years [Amal Hussein, Egypt]	Not applicable - This section was rewritten
50858	36	19	36	20	years of publication are missing in reference in "Mitchell et al. and Pfeifer et al." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
62346	36	19	36	19	Please verify these references "Jacob et al.; Mitchell et al"; the year is missing fo both [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
12856	36	20			The reference to Pfeifer et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
62348	36	20	36	20	Please verify this reference "Pfeifer et al.)"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
35896	36	23	40	34	The All-India annual and monsoon season rainfall for the period 1901-2015 does not show any significant trend. However, Indian summer monsoon rainfall depicts a decreasing tendency during the last three decades of the 20th century (Kulkarni et al., 2012). Guhathakurta et al (2015) also highlighted that while the monsoon seasonal rainfall had a significant increasing trend during the period 1901-50, insignificant decreasing trend in the same was observed over the 1951-2011 period, but substantial spatial variations. The decades 1971–1980. Pai et al. (2014) using the 0.25 degree x0.25 degree gridded data found that during the recent decades, there has been significant decrease of moderate rainfall events, while heavy and very heavy rains have increased in frequency. During the period, 1901–2010, heavy rainfall events (rainfall exceeding 15 cm in 24 hours) over northern parts of the India show an increasing trend of about 6 % per decade. The analysis of rainfall data from observational network of India for the period 1901-2010 revealed increasing trends in the frequency of dry days in most parts of the country during the winter, pre-monsoon and southwest monsoon seasons. The decades 1971–1980 onwards were drier than normal with the recent decade 2001–2010 being the driest. Frequency of rainstorms (weather systems with potential of causing large scale floods) has shown an increasing trend of 4 rainstorms in 65 years during 1951–2015 (Guhathakurta et al., 2017). Duration of rainstorms has shown a substantial increase of about 15 days during the same period. All-India annual precipitation increases by 1.2–2.4% by 2030s under different RCP scenarios and by 3.5–11.3% by 2080s, relative to the pre-industrial base (Chaturvedi et al., 2012). All models and all scenarios project an increase in both the mean and extreme precipitation in the Indian summer monsoon (IPCC WGI AR5). Chaturvedi RJ, Joshi J, Jayaraman M, Bala G, Ravindranath NH (2012). Multi-model climate change projections for India under representative concentration pathways. Current Science, 103, 7, 791-802. Guhathakurta, P., D.S. Pai and M.N. Rajeevan (2017), Variability and Trends of Extreme Rainfall and Rainstorms. In: Rajeevan M., Nayak S. (eds) Observed Climate Variability and Change over the Indian Region. Springer Geology. Springer, Singapore Rajeevan, M., J. Bhate, and A. K. Jaswal (2008), Analysis of variability and trends of extreme rainfall events over India using 104 years of gridded daily rainfall data, Geophys. Res. Lett., 35, L18707, doi:10.1029/2008GL035143. Pai, D.S., Sridhar, L., Rajeevan, M., Sreejith, O.P., Satbhai, N.S., Mukhopadhyay, B., 2014. Development of a new high spatial resolution (0.25°×0.25°) long period (1901–2010) daily gridded rainfall data set over India and its comparison with existing data sets over the region. Mausam, 65, 1, 1–18. Guhathakurta, P. , M. Rajeevan, D. R. Sikka and A. Tyagi 2015 "Observed changes in southwest monsoon rainfall over India during 1901–2011", Int. J. Climatol. 35: 1881–1898. Kulkarni, A., 2012. Weakening of Indian summer monsoon rainfall in warming environment. Theoretical and Applied Climatology 08/2012; 109(3-4). [India]	Noted. Too detailed and regional to be included. However, if considered critical, some material could be added on this in the Annex prior to publication.
49954	36	25	26	27	Is the beach inlude in the definition of Land? Because there is now research in Indonesia working on the effects of beach curvature on rainfall pattern. [Perdinan Perdinan, Indonesia]	Noted. Could not be considered because of space limitations.
50982	36	26	36	27	The sentence about uncertainty is vey hard and can be misunderstood and even over-negatively -interpreted. Please specify more by adding for example "mainly in some regions with missing data ….". Uncertainties are relative. [Fatima Driouech, Morocco]	Accepted. This sentence was removed.
19164	36	30	37	3	It may be worthy to mention in section 3.3.3.1 the study by Turco et al. (2015), showing a decrease in precipitation means over central Africa during the past decades, based on several observational datasets. REF: Turco, M., Palazzi, E., Hardenberg, J., and Provenzale, A. (2015). Observed climate change hotspots. Geophysical Research Letters, 42(9), 3521-3528. [Sonia Jerez, Spain]	Noted. Not enough space to add this publication. If considered critical could be added in Annex prior to publication.
24140	36	31	36	31	Bindoff et al. (2013): Which reference of 2013? 2013a or 2013b? [Mustafa Tufan Turp, Turkey]	Accepted. Section was revised and publication was corrected.
47280	36	31	36	31	Bindoff et al 2013 shoudl be either a or b, as it is listed in the references. [Sarah Connors, France]	Accepted. Section was revised and publication was corrected.
3508	36	32			Remove the two commas in this line. [David Docquier, Belgium]	Not applicable - This section was rewritten
50860	36	32	36	32	...were at the high.." instead of "...was at the high..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
118	36	37	36	37	)assessed to be changed ") assessed" [teodoro georgiadis, Italy]	Not applicable - This section was rewritten
9186	36	37			Please change "(Seneviratne et al., 2012)assessed" to "(Seneviratne et al., 2012) assessed" [Marco Turco, Spain]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
21794	36	37			insert space between "2012)assessed" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39682	36	37	36	37	Insert space after the closing parenthesis in "...(Seneviratne et al., 2012)assessed..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
41540	36	37	36	37	2012) assessed [Sergio Aquino, Canada]	Not applicable - This section was rewritten
44348	36	37	36	37	Space is missing "(Seneviratne et al., 2012)assessed that" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
46676	36	37	37	37	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted. Use of IPCC uncertainty language was checked.
50862	36	37	36	37	...2012) assessed... instead of "...2012)assessed..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
62350	36	37	36	37	Instead of writing "The IPCC SREX (Seneviratne et al., 2012)assessed that", please write"The IPCC SREX (Seneviratne et al., 2012) assessed that" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
5592	36	38	36	38	95th percentile…is it 95% percentile? [Sandra CASSOTTA, Denmark]	Not applicable - This section was rewritten
276	36	40	36	40	.....2012). (SPACE) Further, it..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
21796	36	40			insert space between "2012).Further" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39684	36	40	36	40	Insert space after the point in: ".Further" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44350	36	40	36	40	Space is missing "(Seneviratne et al., 2012).Further, it" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
50864	36	40	36	40	...2102). Further... instead of "...2102).Further..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
62352	36	40	36	40	Instead of writing "variations in the trends (Seneviratne et al., 2012).Further,"; please write "variations in the trends (Seneviratne et al., 2012). Further," [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
46678	36	44	36	44	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - This section was rewritten; note that IPCC language has been used as suggested (also in the referenced SOD text).
28240	36	47	36	47	What kind of trends? Please clarify. [Germany]	Rejected. Not enough space to provide details. Since there is low confidence in the trends, more information on them is not useful.
50654	36	47	40	34	For some regions with very large populations and diversity of biomes (eg S. Asia) there is additional uncertainity because climate models have been unable to simulate observed trends in precipitation and thus future projections are even more problematic. [Jagdish KRISHNASWAMY, India]	Don't understand comment. If this is a suggested revision, a reference should have been provided.
50656	36	47	40	34	Perhaps recent region specific papers on trends in mean and extremes as well as non-linearity and non-stationarity of Indian Monsoon could be cited. This will help avoid repetition of papers by few authors [Jagdish KRISHNASWAMY, India]	Rejected. Cannot add very regional details given space limitations.
17326	36	48	37	3	This sentece needs editing for grammar [David Schoeman, Australia]	Accepted. Section was revised.
17696	37		39		Add recenty studies for East Asia. We note some references, here. Lee, D., S.-K. Min, E. Fischer, H. Shiogama, I. Bethke, L. Lierhammer, and J. Scinocca, 2018: Impacts of half a degree additional warming on the Asian summer monsoon rainfall". Env. Res. Lett., under revision. Nguyen T.-H., ?S.-K. Min, S. Paik, and D. Lee, 2018: Time of Emergence in Regional Precipitation Changes: An Updated Assessment Using the CMIP5 multi-model ensemble. Climate Dyn., doi:10.1007/s00382-018-4073-y. Endo H and Kitoh A 2014 Thermodynamic and dynamic effects on regional monsoon rainfall 403 changes in a warmer climate Geophys. Res. Lett. 41 1704-1711 404 doi:10.1002/2013GL059158 Freychet N, Hsu H H, Chou C and Wu C H 2015 Asian summer monsoon in CMIP5 projections: A link between the change in extreme precipitation and monsoon dynamics J. Clim. 28 1477-1493 [Republic of Korea]	Noted. Too regional and detailed. Will double check for possible inclusion prior to publication.
35898	37	1	37	2	Follwing citations to be added. There is a significant decreasing trend in summer monsoon rainfall over the southern parts of Western Ghats (Rajendran et al 2012 & Rajendran et al. 2013). References: 1). K. Rajendran, A. Kitoh, J. Srinivasan, R. Mizuta, and R. Krishnan 2012: Monsoon circulation interaction with Western Ghats orography under changing climate- Projection by a 20-km mesh AGCM. Theoretical and Applied Climatology, 110(4), 555-571. 2). K. Rajendran, Sajani Surendran, C. B. Jayasankar, and A. Kitoh, 2013: How dependent is climate change projection of Indian summer monsoon rainfall and extreme events on model resolution? Current Science, 104 (10), 1409-1418. [India]	Rejected. Too detailed and not specific to 1.5°C climate. If considered very critical as background information, could considered, however, to add a reference in the Annex prior to publication.
35900	37	2	37	3	High resolution simulations using a variable resolution global atmospheric model with telescopic zooming (grid-size ~35 km) over South Asia generated at CCCR, IITM, for the 20th century (1886-2005) was used for attribution of recent decadal changes in monsoon precipitation over India due to natural and anthropogenic forcing. Results suggest that anthropogenic aerosols and land-use changes have likely influenced the observed decreasing trend of monsoon precipitation. The high-resolution simulation with anthropogenic forcing (GHG, aerosols, land-use change) shows a robust increasing trend in the frequency of heavy precipitation (intensity > 100 mm day-1) over Central India (Krishnan et al. 2016). [India]	Noted. Too detailed and regional to be included. However, if considered critical, some material could be added on this in the Annex prior to publication.
12028	37	5	37	5	Section should reference Li et al https://www.sciencedirect.com/science/article/pii/S2095927317306400 and Zhang and Villarini https://link.springer.com/article/10.1007/s10584-017-2079-9 [United Kingdom (of Great Britain and Northern Ireland)]	Noted. Could not be added because of space constraints. If considered very critical, can consider including references in Annex prior to publication.
16060	37	5	40	21	It is surprising that the King et al. (2017) reference on Australian climate extremes and Andrew D King and David J Karoly 2017 Environ. Res. Lett. 12 114031 are not mentioned in Section 3.3.3.2. [Australia]	Noted. Too regional and detailed. Will double check for possible inclusion prior to publication.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16062	37	5	40	34	This section on regional precipitation needs a clearer focus and structure. It should begin with the key findings from AR5 WG1 Chapters 12 and 14. There shouid also be a summary of the processes driving regional precipitation change, including "wet gets wetter" (Held and Soden 2006) and shifts in convection (Chou et al. 2009; Seager et al. 2010; Chadwick et al. 2013). The paragraphs should focus on clear topics, and the literature review should be balanced. The section on monsoons does not capture the consensus expressed in AR5 Chapter 14 or other recent major papers. [Australia]	Noted. More material from AR5 was added. Note that "wet gets wetter" paradigm has been shown not to be very helpful for interpretation of changes in precipitation over land (see e.g. Gree et al. 2014, Nature Geoscience), hence is not referred to avoid confusion.
19098	37	5	40	34	It may be useful to cite the following papers that discuss future changes in precipitaion extremes and monsoon based on the HAPPI experiments. (1) Shiogama, H. et al. Reduced inequities in extreme climate hazards with the 1.5 ºC goal of the Paris Agreement. Nature Communications, submitted. (Contact: Hideo Shiogama, shiogama.hideo@nies.go.jp) (2) Saeed, F. et al. Robust changes in tropical rainy season length at 1.5°C. Environ. Res. Lett., submitted (Contact: Fahad Saeed, fahad.saeed@climateanalytics.org) (3) Lee D., et al. Impacts of half a degree additional warming on the Asian summer monsoon rainfall. Environ. Res. Lett., submitted (Contact: Donhyun Lee, donhyunlee@postech.ac.kr) [HIDEO SHIOGAMA, Japan]	Noted. Could not be added because of space constraints. If considered very critical, can consider including references in Annex prior to publication.
35064	37	5	37	5	A recent study of China can be cited under the section : In northeastern China this is particularly pronounced with regional averaged precipitation increases of more than 7.2%, which is greater than that for the whole East Asian continent (approximately 4.2%). As there is stronger surface warming over the East Asian continent than that over surrounding ocean, the land–sea thermal contrast is enhanced during the 1.5 GW period. As a result, the monsoon circulation in the lower troposphere is significantly strengthened, which causes the increased summer precipitation over the East Asian continent. References: WANG Tao, MIAO Jia-Penga, SUN Jian-Qi, FU Yuan-Haid (2017). Intensified East Asian summer monsoon and associated precipitation mode shift under the 1.5 C global warming target. Advances in Climate Change Research, 1-10. [Shaukat Ali, Pakistan]	Rejected. Too detailed and regional given space constraints. However, if considered critical, could be added in Annex prior to publication.
35284	37	6	37	16	A recent CMIP5-based study of Nguyen et al. (2018) looks very relevant here. They indentified hotspots of seasonal mean precpitation changes between RCP2.6 (equivalent to 1.5 degree condition) and higher-emission scenarios (RCP4.5 and RCP8.5), such as northern high-latitude wettening during winter, subtropical drying in summer, and South Asian wetteing during summer. Nguyen T.-H., ?S.-K. Min, S. Paik, and D. Lee, 2018: Time of Emergence in Regional Precipitation Changes: An Updated Assessment Using the CMIP5 multi-model ensemble. Climate Dyn., doi:10.1007/s00382-018-4073-y. [Seung-Ki Min, Republic of Korea]	Noted. Too detailed to be included. However, if considered critical, could be added prior to publication.
49878	37	6	37	16	Two recent studies that can be included here are Kjellström et al 2017 (https://www.earth-syst-dynam-discuss.net/esd-2017-104/esd-2017-104.pdf) and Nikulin et al 2018 (http://iopscience.iop.org/article/10.1088/1748-9326/aab1b1) [Erik Kjellström, Sweden]	Noted. Rather too regional (Europe, Africa) to be included given space limitations. But could consider adding reference prior to publication if considered critical.
17328	37	7	37	7	Replace "investigates" with "investigated". [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
17330	37	9	37	9	The sentence structure is hghly ambiguous here [David Schoeman, Australia]	Rejected. Text is understandable.
17332	37	11	37	16	This is a long and awkward sentence. Consider revising. [David Schoeman, Australia]	Noted. Will try to revise sentence prior to publication to make point clearer.
28242	37	11	37	12	1.5°C and 2°C are not scenarios; the term (global) warming should be used. [Germany]	Noted, accepted. Will fix this prior to publication.
28244	37	13	37	13	What does robust mean in this context? The use of the term robust for "a certain number of models agree in the sign of the projected change" might be misleading. Please assure consistency with agreed confidence language. [Germany]	Agreed, but the word "robust" refers to the same use as in the cited papers and in the paper IPCC confidence language has not been used.
10308	37	16	37	33	The references in lines of 16, 31 and 33 are not full. Please correct them. [Hungary]	Accepted. Were completed for two of them. Sieck reference was dropped.
12858	37	16			The reference to Jacob et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Accepted. Year was added.
39686	37	16	37	16	The year of publication is missing in "(Jacob et al.)" [Hernan Edgardo Sala, Argentina]	Accepted. Year was added.
40214	37	16	37	16	the reference "(Jacob et al.)" was written without the years, please add the missed year [Amal Hussein, Egypt]	Accepted. Year was added.
44352	37	16	37	16	Year is missing "(Jacob et al.)" [Rita Man Sze Yu, China]	Accepted. Year was added.
50866	37	16	37	16	year of publication is missing in reference "Jacob et al...." [Amjad Masood, Pakistan]	Accepted. Year was added.
62354	37	16	37	16	Please verify this reference "(Jacob et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Year was added.
13860	37	18	37	37	Scaling of long period precipitation return values with temperature at regional scales has been shown to follow local (not global) Clausius-Clapeyron scaling and is detailed in Kharin et al. (2013) Changes in temperature and precipitation extremes in the CMIP5 ensemble, Climatic Change 119, 345-357 10.1007/s10584-013-0705-8. Such a discussion of local C-C scaling and the differences between the 1.5 and 2C scenarios would be useful. The scaling with global mean temperature change as presented has no obvious physical intrepretation. [Michael Wehner, United States of America]	Noted. But too detailed for chapter, and already addressed in AR5
60370	37	18	37	37	Scaling of long period precipitation return values with temperature at regional scales has been shown to follow local (not global) Clausius-Clapeyron scaling and is detailed in Kharin et al. (2013) Changes in temperature and precipitation extremes in the CMIP5 ensemble, Climatic Change 119, 345-357 10.1007/s10584-013-0705-8. Such a discussion of local C-C scaling and the differences between the 1.5 and 2°C scenarios would be useful. The scaling with global mean temperature change as presented has no obvious physical intrepretation. [United States of America]	Noted. But too detailed for chapter, and already addressed in AR5
61854	37	18	37	36	This section reads as a description of recent publications rather than an assessment using the calibrated language. The section on Harvey should drop if this is assessed in section 3.3.7. A logical flow of information between what is observed and what is projected is missing. [Valérie Masson-Delmotte, France]	Accepted. Text was substantially revised. Assessment was made stronger. Reference to Harvey was dropped and move to section on tropical cyclones. Flow of information between what is observed and what is projected is done in Table 3.2
28246	37	22	37	26	Why is the response independent of the considered emissions scenario when there is a strong coupling to temperature? [Germany]	Has not been fully investigated. Two possible explanation: Either, 1) specificities of scenarios (e.g. aerosol loading) do not strongly affect the climate response beside the global warming, or 2) there is not enough consideration of possible variations in forcers in the scenarios (e.g. on regional scale).
50988	37	24	40	34	Please include sentences about changes of mean precipitation; the summary is mainly focusing on extremes [Fatima Driouech, Morocco]	Rejected. Changes in mean precipitation are covered in Section 3.3.1.
119	37	26	37	26	)suggest to be changed ") suggests" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
277	37	26	37	26	.....2017a) (SPACE) suggests that..... [Paul Doyle, Canada]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
3512	37	26			Replace 'suggests' by 'suggest'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
7522	37	26	37	26	..Wartenberger et al. (2017a) suggests.. [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
9188	37	26			Please change "(2017a)suggests" to "(2017a) suggests" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
12030	37	26	37	27	What are the "substantial differences" please quantify [United Kingdom (of Great Britain and Northern Ireland)]	Noted. This can be inferred from the provided analyses. Will consider including some clarification in the text prior to publication.
21798	37	26			insert space between "2017a)suggest" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
29432	37	26	37	26	A space is missing between "(2017a)" and "suggests". [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised with the suggested edit
35276	37	26	37	27	A recent study (Lee et al. 2018) based on the HAPPI multi-model experiment exactly supports this, worth citing. Discussion on associated mechanism can also be considered; Focusing on East Asian and South Asian monsoon regions, they demonstrated that increased moisture with warming (Clausius-Clapeyron relation) plays a critical role in the stronger intensification of more-extreme rainfall with warming. Lee, D., S.-K. Min, E. Fischer, H. Shiogama, I. Bethke, L. Lierhammer, and J. Scinocca, 2018: Impacts of half a degree additional warming on the Asian summer monsoon rainfall". Env. Res. Lett., under minor revision. [Seung-Ki Min, Republic of Korea]	This article was not available at time of review. Will consider for possible reference prior to publication.
39688	37	26	37	26	Insert space after the closing parenthesis in "...(2017a)suggests..." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
44354	37	26	37	27	Space is missing after two references [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
49144	37	26			The same conclusion can be drawn for Southern Asia [Bill Hare, Germany]	Rejected. See sentence in FGD (page 33, top two lines): "Some regions display substantial increases, for instance in Southern Asia, but generally in less than 2/3 of the CMIP5 models"
50868	37	26	37	26	...(2017a) suggests.... instead of "...(2017a)suggests...." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
278	37	27	37	27	.....2014) (SPACE) found a..... [Paul Doyle, Canada]	Accepted - Text was revised with the suggested edit
21800	37	27			insert space between "2014)found" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
24150	37	27	37	27	In the sentence of "Vautard et al. (2014)found..." break a space before "found" [Mustafa Tufan Turp, Turkey]	Accepted - Text was revised with the suggested edit
29434	37	27	37	27	A space is missing between "(2014)" and "found". [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised with the suggested edit
39690	37	27	37	27	Insert space after the closing parenthesis in "...(2014)found..." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
50870	37	27	37	27	...(2014) found... instead of "...(2014)found..." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
62356	37	27	37	27	Instead of writing "Vautard et al. (2014)found a robust increase", please write "Vautard et al. (2014) found a robust increase" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
53082	37	29	37	33	There are climate change studies using resolutions higher than 12 km, e.g., Hanrahan et al (2014) downscaled SRES climate scenarios to 3 km resolution in the inner domain of a 3-domain system for central Alberta. Hanrahan, J., Kuo, C. C., and Gan, T. Y., 2014, Configuration and validation of a mesoscale atmospheric model for simulating summer rainfall in Alberta, Int. J. of Climatology, RMS, 35(5), 660-675. DOI:10.1002/joc.4011. Further, Representative Concentration Pathways, RCP 4.5 and RCP 8.5 climate scenarios of 10 Global Climate Models (GCMs) were statistically downscaled by the Pacific Climate Impacts Consortium (PCIC) using the Bias-Correction Spatial Disaggregation (BCSD) method. [Thian Gan, Canada]	Rejected. These analyses seem not specific to 1.5 or 2°C responses. Will double check prior to publication.
5594	37	31	37	31	the citations do not have the years [Sandra CASSOTTA, Denmark]	Editorial. This was fixed
7796	37	31			jacob et al. and Pfeifer et al. - which years are they? [Anthony Lupo, United States of America]	Accepted - Text was revised with the suggested edit
7798	37	31			sieck? [Anthony Lupo, United States of America]	Not applicable - This text was deleted
12860	37	31			The reference to Jacob et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
12862	37	31			The reference to Pfeifer et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This reference was deleted
21802	37	31			add "year" in citation or delete the reference (two cases in this line) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
35902	37	31	37	33	Incomplete references for Jacob et al and Sieck. Add complete reference [India]	Accepted - Text was revised with the suggested edit
40216	37	31	37	31	the years in the two references "(Jacob et al.; Pfeifer et al.)" were missed, please add the missed year [Amal Hussein, Egypt]	Editorial. This was fixed
44356	37	31	37	33	Year is missing in several references [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
50872	37	31	37	31	years of publication are missing in reference in "Jacob et al. and Pfeifer et al." [Amjad Masood, Pakistan]	Editorial. This was fixed
62358	37	31	37	31	Please verify these references "(Jacob et al.; Pfeifer et al.)."; the year is missing for both [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
3514	37	32			Replace 'in' by 'an'. [David Docquier, Belgium]	Not applicable - This text was deleted
17334	37	32	37	32	Replace "in" with "an". [David Schoeman, Australia]	Not applicable - This text was deleted
35066	37	32	37	32	The correct expression is "an increase of" which is written as "in increase of" [Shaukat Ali, Pakistan]	Not applicable - This text was deleted
40218	37	32	37	32	in is "an" [Amal Hussein, Egypt]	Not applicable - This text was deleted
50986	37	32	37	32	for Europe show in increase ==> for Europe show an increase [Fatima Driouech, Morocco]	Not applicable - This text was deleted
56288	37	32	37	32	Change "in" to "an". [Annika Herbert, Australia]	Not applicable - This text was deleted
12864	37	33			The reference to Sieck is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
21804	37	33			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This text was deleted
24152	37	33	37	33	(Sieck) ---> What is this? Reference? [Mustafa Tufan Turp, Turkey]	Not applicable - This text was deleted
39692	37	33	37	33	The year of publication is missing in "Sieck" [Hernan Edgardo Sala, Argentina]	Not applicable - This text was deleted
50874	37	33	37	33	year of publication is missing in reference (Sieck) [Amjad Masood, Pakistan]	Publication no longer cited.
46680	37	34	37	34	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable. Sentence was removed.
17336	37	35	37	36	Sentence structure is awkward, inadvertently inverting the sequence of cause and effect in attribution. [David Schoeman, Australia]	Accepted - Text was revised
41332	37	35	37	37	Since "likely" is a calibrated language, it is suggested that it not be used unless it is to denote a confidence level. [Lourdes Tibig, Philippines]	Accepted - Text was revised
54368	37	36	37	36	please add a reference [Robert Vautard, France]	Not applicable. Sentence was removed.
7520	37	37	37	37	…(Seneviratne et al., 2012) assessed… [Jens Zinke, Germany]	Not applicable - This section was rewritten
1380	38				See earlier comment on figure 3.8: too much information in the small plots [Karen Olsen, Denmark]	Noted. Figure was revised to improve readability. Note that full resolution figure is available separately and not in pdf.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6196	38				See earlier comment on figure 3.8: too much information in the small plots [Anne Olhoff, Denmark]	Noted. Figure was revised to improve readability. Note that full resolution figure is available separately and not in pdf.
17834	38				Like Box 3.3, Climate Change related problems in Mid-Latitude should be deal with in a Box. [Republic of Korea]	Rejected. Could not be addressed due to space constraints. Also, mid-latitude regions are well covered in the literature and in past IPCC reports.
18282	38				See earlier comment on figure 3.8: too much information in the small plots [Andrea TILCHE, Belgium]	Noted. Figure was revised to improve readability. Note that full resolution figure is available separately and not in pdf.
3516	38	1			Figure 3.12: Wouldn't it be more interesting to plot 'Delta Rx5day / Delta Tglob' instead of 'Delta Rx5day' for the map? It would show the change of annual 5-day maximum precipitation per degree warming. This ratio seems to be around 3-4 mm/°C for the global land. [David Docquier, Belgium]	Noted. Both are interesting. In the context of comparing changes at 1.5°C vs 2°C global warming this analysis was considered more useful.
7866	38	1	38	5	Figure 3.12: How were the confidence bars to the HAPPI outcome calculated? Please explain. Same for Fig. 3.15. [Petr Zavialov, Russian Federation]	Accepted - additional information included in Annex 3.1 S3-3
16064	38	1	38	1	We question the validity of combining New Zealand with southern Australia for the purpose of mapping regional precipitationand/or aridity in historical data sets and in future projections. These are two different regions with possibly different climate responses under 1.5 and 2C warmed scenarios. This applies to Figures 3.12, and 3.15. It may be valid to combine these regions as one, but this takes some justification. [Australia]	Noted. Given time constraints of SR15 report, it was considered too difficult to revise regions' definition. Note that the definitions are the same as in AR5
39694	39	5	39	5	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
50876	39	5	39	5	year of publication is missing in reference "Seneviratne et al...." also the sentence does not make sense, may need to be completed [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
8026	39	7	39	27	Kitoh et al. (2013) provided a new view of global and regional monsoonal rainfall, and their changes in the 21st century under RCP4.5 and RCP8.5 scenarios as projected by 29 climate models that participated in the Coupled Model Intercomparison Project phase 5. The global monsoon precipitation intensity and the global monsoon total precipitation are also projected to increase. Indices of heavy precipitation are projected to increase much more than those for mean precipitation. Over the Asian monsoon domain, projected changes in extreme precipitation indices are larger than over other monsoon domains, indicating the strong sensitivity of Asian monsoon to global warming. Over the American and African monsoon regions, projected future changes in mean precipitation are rather modest, but those in precipitation extremes are large. Models project that monsoon retreat dates will delay, while onset dates will either advance or show no change, resulting in lengthening of the monsoon season.For details, please see: Kitoh, A., H. Endo, K. Krishna Kumar, I. F. A. Cavalcanti, P. Goswami, and T. Zhou, 2013: Monsoons in a changing world: a regional perspective in a global context. J. Geophys. Res. Atmos., 118, doi:10.1002/jgrd.50258 [Tianjun Zhou, China]	Noted. Given uncertainties highlighted in AR5 and time constraints of SR15, could not be integrated.
8028	39	7	39	27	Zhang et al. (2017) investigated changes in exposure to extreme precipitation (i.e., maximum accumulated 5-day precipitation, RX5day, as a proxy for potential flooding risks) at different warming levels over the populous global land monsoon (GM) region, based on multimodel projections under Representative Concentration Pathway (RCP) 8.5 in the fifth phase of the Coupled Model Intercomparison Project (CMIP5). They find that both area and population exposures to 'dangerous' extreme precipitation events (i.e., exceeding 1-4 standard deviations, ?, from their climatology) increase nonlinearly with increasing warming levels. Over the GM region, the avoided impacts by the 0.5°C less warming amount to 118% (57%-140% for the 25th-75th percentile) and 115% (29%-178%) for area and population exposures to 4? exceedance events, respectively. The increases in exposure to the upper tail extremes are related to increases in both the mean state and the variability of extreme precipitation with warming. Among sub-monsoon regions, South Africa is a primary hotspot, followed by South Asia, East Asia, and South America. Future changes in extreme precipitation in North American and Australian monsoon regions are uncertain. Nonlinear increases in exposure with further warming, highlight the importance and necessity of realizing the 1.5°C warmer world. Details are referred to: Zhang W. et al. 2017: Reduced exposure to extreme precipitation by 0.5°C less warming for global land monsoon regions. Nature Communication, under review [Tianjun Zhou, China]	Rejected. Too detailed.
8030	39	7	39	27	Li et al. (2017) projected the changes in the mean and extreme high temperatures over East Asia in response to warmings of 1.5°C and 2°C. Most densely populated subregions, including eastern China, the Korean Peninsula and Japan, will see larger increases in extreme high-temperature events than the other subregions of East Asia in terms of intensity, requency and duration under 1.5°C and 2°C warming. The 0.5°C lower warming will help avoid 35%-46% of the increases in the frequency, intensity and duration of extreme high-temperature events in East Asia with maximal avoidance values (37%-49%) occurring in Mongolia. For details, please see: Li D. et al. 2017: Extreme high-temperature events over East Asia in 1.5°C and 2°C warmer futures: Analysis of NCAR CESM low-warming experiments. GRL, in press [Tianjun Zhou, China]	Noted. Could not be added because of space constraints. If considered very critical, can consider including references in Annex prior to publication.
35280	39	7	39	28	I like to inform you of two recent studies examining changes in monsoon precipitation for 1.5 degree vs. 2 degree conditions. Lee et al. (2018) based on the HAPPI multi-model experiment suggested that there could be substantial changes in summer monsoon rainfall over East Asia and South Asia at 1.5 degree vs. 2 degree. Nguyen et al. (2018) based on the CMIP5 multi-model ensembles found significant differences in the summer rainfall increase over South Asia at RCP2.6 (which is equivalent to 1.5 degree condition) vs. RCP4.5. Lee, D., S.-K. Min, E. Fischer, H. Shiogama, I. Bethke, L. Lierhammer, and J. Scinocca, 2018: Impacts of half a degree additional warming on the Asian summer monsoon rainfall". Env. Res. Lett., under minor revision. Nguyen T.-H., ?S.-K. Min, S. Paik, and D. Lee, 2018: Time of Emergence in Regional Precipitation Changes: An Updated Assessment Using the CMIP5 multi-model ensemble. Climate Dyn., doi:10.1007/s00382-018-4073-y. [Seung-Ki Min, Republic of Korea]	Noted. Could not be added because of space constraints. If considered very critical, can consider including references prior to publication.
10310	39	11	39	12	The terminology of "reliable climate models" should be explained a bit, furthermore with "weak projected changes" it seems a bit strange. Also, after "A1B scenario" "and" is needed instead of "or". [Hungary]	Not applicable - This section was rewritten
28248	39	11	39	11	Please explain what "reliable" means here. [Germany]	Not applicable - This section was rewritten
44358	39	11	39	11	What is "reliable" climate models? [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
44360	39	11	39	11	A1B scenario or [and?] the RCP4.5 [Rita Man Sze Yu, China]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
28250	39	12	39	12	The winter monsoon is a dry wind blowing from land to ocean; please briefly state why this is relevant in the section on precipitation? [Germany]	Rejected. Changes in dry monsoon season affects annual precipitation
28252	39	19	39	21	Please explain "amplitude of the South American Monsoon System". How is this defined/measured? [Germany]	Not applicable - This section was rewritten
8032	39	29	39	44	Based on the CORDEX-EA experiment, Zou and Zhou (2016) show evidences that followed by an enhanced western North Pacific subtropical high and an intensified East Asian summer monsoon, an increase in total rainfall over north China, the Korean Peninsula, and Japan but a decrease in total rainfall over southern China are observed in the FROALS projection. Homogeneous increases of extreme rainfall amounts were found over the CORDEX-East Asia domain. A predominant increase in the interannual variability was evident for both total rainfall and the extreme rainfall amount.For details, please see: Zou Liwei, Tianjun Zhou, 2016, Future summer precipitation changes over CORDEX-East Asia domain under the RCP8.5 scenario downscaled by a regional ocean-atmosphere coupled model: A comparison to the stand-alone RCM. Journal of Geophysical Research - Atmospheres, 121, 2691–2704, doi:10.1002/2015JD024519 [Tianjun Zhou, China]	Noted. Text on monsoon was substantially reduced. If considered very critical, will see if a reference might need to be added prior to publication.
8034	39	29	39	44	Li et al. (2017) investigated the changes of extreme indices over China in response to 1. 5C global warming downscaled by a RCM. In comparison to the baseline climate over the period of 1986-2005, warm events would significantly increase while cold events would significantly decrease over Chinain a 1. 5 ? warmer world. The risks of extreme and moderate warm events would be 2. 14 and 1. 93 times of that in the baseline period, respectively. The risks of extreme and moderate cold events would be 0. 58 and 0. 63 times of that in the baseline period, respectively. Compared to other sub-regions, the increasing amplitude of extreme warm events would be higher in North China, while the decreasing amplitude of extreme cold events would be higher in Northeast China. Risks of extreme dry events would increase in Northwest China, Tibetan Plateau and Northeast China (1. 13, 1. 02 and 1. 22 times of that in baseline period). Precipitation intensity and extreme wet events would increase significantly over most parts of China, and the increasing amplitudes extreme wet events will be higher in North China and South China (1. 88 and 1. 85 times of that in the baseline period). Days when people may feel uncomfortable would increase significantly in eastern China, and compared to simple extreme warm events, the increasing amplitude of extreme uncomfortable days would be larger. The absolute changes of heating degree-days would be larger than that of cooling degree-days (-258? ·d and 72? ·d, respectively) in eastern China, but the relative change of heating degree-days would be smaller than cooling degree-days (- 10% and 82% , respectively). For details, please see: Li Donghuan Zhou Liwei, Zhou Tianjun. Changes of extreme indices over China in response to 1. 5 ? global warming projected by a regional climate model[J]. Advances in Earth Science, 2017,32(4):446-457,doi:10.11867/j.issn.1001-8166.2017.04.0446 [In Chinese with English abstract] [Tianjun Zhou, China]	Rejected. Too detailed.
53084	39	30	39	30	The Coordinated Regional Climate Downscaling Experiment (CORDEX) (Giorgi et al. 2009), initiated by the World Climate Research Program, has developed high-resolution (50 km) regional climate projections for different regions using a RCM. However, Endris et al. (2013) compared the performance of 10 RCMs in simulating the rainfall of East Africa. They found some RCMs could simulate reasonable rainfall climatology for East Africa but most RCMs' simulations suffer significant biases. It seems we should be careful when using results of CORDEX. Endris HS, Omondi P, Jain S et al (2013) Assessment of the performance of CORDEX regional climate models in simulating East African rainfall. J Clim. https //doi.org/10.1175/JCLI-D-12-00708 [Thian Gan, Canada]	Rejected. We have highlighted on areas where models agree: increase of rainfall in Ethiopian highlands (even in downscaled simulations), instead of giving only a regional view of the rainfall changes with uncertainties.
3518	39	38	39	42	This is about temperature, and not precipitation. Thus, consider removing from this section. [David Docquier, Belgium]	Accepted. Text was removed.
7524	39	38	39	38	…Weber et al. … publication year missing [Jens Zinke, Germany]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
10312	39	38	39	38	The reference is not full, please correct it. [Hungary]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
11988	39	38	39	42	These sentences discuss changes in temperature and heatwave frequency and duration in the middle of a section of precipitation - would make more sense structurally if these were in the previous section (temperatures and extreme temperature events). [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text was removed.
13572	39	38	39	42	In this part of chapter 3.3.3 Regional Precipitation, including heavy precipitation and monsoons, specifically in section 3.3.3.2 Projected changes at 1.5°C vs. 2 ° C in regional precipitation, between lines 38 and 40 is written about hot nights and changes in temperature, therefore it is out of context since the paragraph is about the projected changes in rainfall. [Chile]	Accepted. Text was removed.
21806	39	38			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
44362	39	38	39	38	Year is missing "Weber et al." [Rita Man Sze Yu, China]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
49146	39	38	39	42	Section 3.3.2.2 is dedicated to regional changes in temperature, adding mentions of these here only increases confusion [Bill Hare, Germany]	Accepted. Text was removed.
50878	39	38	39	38	year of publication is missing in reference in "Weber et al." [Amjad Masood, Pakistan]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
62360	39	38	39	38	Please verify this reference "Weber et al."; the year is missing and it should be put in backets… [JACQUES-ANDRE NDIONE, Senegal]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
10314	39	39	39	42	Are these two sentences (about hot nights) relevant here as the paragraph is about the regional precipitation indices? [Hungary]	Accepted. Text was removed.
17338	39	39	39	39	Replace "Africa" with "African". [David Schoeman, Australia]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
17342	39	39	39	44	This paragraph is supposed to be about precipitation, not temperature [David Schoeman, Australia]	Text transferred to Annex. Editorial - copyedit to be completed prior to publication
17340	39	40	39	40	Replace "will be" with "is". [David Schoeman, Australia]	Text transferred to Annex. Accepted - Text was revised with the suggested edit
39696	39	41	39	41	I suggest to use "heat-waves" instead of "heatwaves" to keep consistency along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	Not applicable. Text was removed.
17344	39	46	39	46	Delete "Similarly" [David Schoeman, Australia]	Noted. Will be corrected prior to publication.
41542	39	46	39	46	and key risks [Sergio Aquino, Canada]	Rejected. Editorial, not critical. But can be considered for correction prior to publication.
10316	39	49	40	1	The sentence ("The figure displays...") could be omitted as it already appears under the figure and it belongs to there. [Hungary]	Editorial - copyedit to be completed prior to publication
35904	40		40		Fig 3.13 - The statement in Page 3-40, Lines 29-30 "Southern Asia is a hot spot for increases in heavy precipitation between these two global temperature levels" needs revision. The downscaled CMIP5 precipitation projections also show increases R95ptot during near-term for all RCP scenarios with consensus in the sign of change among the regional climate models (Sanjay et al. 2017). [India]	Not applicable. Text was removed.
50990	40		43		This Box3.2 is welcome But please introduce more informative/explanation text and not be limited to a simple description of the graphics [Fatima Driouech, Morocco]	Accepted text revised with insights from other sections. All figure have been removed.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
41474	40	3	40	29	They need to explain on the mechnaisms of increasing in heavy precipitation in South Africa here. [Izuru Takayabu, Japan]	Comment unclear. This section is not specifically on South Africa. But very detailed regional information cannot be included due to space limitations.
17826	40	6	40	7	We suggest reprashing it as "Eastern Asia (including China, Korea, and Japan)" for completeness or just "Eastern Asia" [Republic of Korea]	Noted. Will be considered prior to publication
35278	40	6	40	7	I would suggest reprashing it as simply "Eastern Asia" to avoid any confusion, not listing a couple of countries. [Seung-Ki Min, Republic of Korea]	Noted. Will be corrected prior to publication.
1382	40	8	40	21	Figure is too complicated: delete (same goes for all other figures of the same kind) [Karen Olsen, Denmark]	Rejected. Other reviewers found it useful.
6198	40	8	40	21	Figure is too complicated: delete (same goes for all other figures of the same kind) [Anne Olhoff, Denmark]	Rejected. Other reviewers found it useful.
16066	40	8	40	21	This graphic is not useful. In particular the three-letter region codes are not defined. [Australia]	Rejected. Other reviewers found it useful.
18284	40	8	40	21	Figure is too complicated: may consider simplifying or deleting (same goes for all other figures of the same kind) [Andrea TILCHE, Belgium]	Rejected. Other reviewers found it useful.
52620	40	8	40	9	Would suggest revising Figure 3.13 (and other related and similar tables) by having boxes with negative signs (other than those denoted by grey) representing -ve differences, be denoted by a different colour to the red ones (in a colour blind firendly scheme) to make the -ve vs +ve more immediately visible, thus providing bettercontrasts between decreases and increases. [Charlotte Roehm, United States of America]	Noted. Could be considered prior to publication, in particular for consistency with new figure 3.14
3520	40	9			Figure 3.13: A suggestion to improve this interesting figure is to color significant negative signs in blue (rather than the same color as for significant positive signs, which would stay in the original color). [David Docquier, Belgium]	Noted. Could be considered prior to publication, in particular for consistency with new figure 3.14
10318	40	10	40	21	The definition of the indices are not complete, some of them are missing: for CWD it is >1 mm; for R99ptot is it for >1 mm or all days?; for SDII is it >1 mm? [Hungary]	Noted. Has been partly fixed. Could provided more detailed information prior to publication (e.g. thresholds for definition of wet days).
53682	40	10	40	10	Figure 3.13, units of different Indices are missing. The figure number "Fig. 3.3.13.XXXd" should be corrected. [AKM SAIFUL ISLAM, Bangladesh]	Rejected. Units are not meaningful. This is only a qualitative analysis
39698	40	17	40	17	What is "XXXd" in "Fig. 3.3.13.XXXd"? [Hernan Edgardo Sala, Argentina]	Taken into account
53086	40	17	40	17	What is Fig. 3.3.13.XXXd? [Thian Gan, Canada]	Taken into account
57566	40	17	40	17	there is no figure 3.3.13 [Hans Poertner, Germany]	Accepted text revised
21808	40	18			In statistical language the right term is "non-statistically significant" which is different from "insignificant" (avoid the use of this term... it is not correct) [LUIS VALDES, Spain]	Accepted. Will be corrected prior to publication
39700	40	20	40	20	Delete space before closing parenthesis in: "(1995)". [Hernan Edgardo Sala, Argentina]	Accepted text revised
56734	40	20	40	20	Missed a half bracket after (1995)? [Xiaolin Zhang, China]	Accepted text revised
52822	40	24	40	24	Summaries/Global Summaries are useful to remind the reader the key findings of a section. Should they be used in other chapters? [Iulain Florin VLADU, Germany]	Accepted. When possible, summaries were included.
3522	40	25			Remove 'heavy' as this statement applies to all precipitation. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
13940	40	25	40	34	One issue you might want to mention is that precipitation changes especially are very sensitive to aerosols and how aerosols are incorporated into the models. Aerosols are very regional in their amounts and impacts, and may be more important than green house gases in some regions for forincg changes in preicpitation (e.g. Wang, H., S.-P. P Xie, and Q. Y Liu. 2016. “Comparison of Climate Response to Anthropogenic Aerosol versus Greenhouse Gas Forcing: Distinct Patterns.” Journal of Climate 29: 5175–88. doi:10.1175/JCLI-D-16-0106.1. Kloster, S, F Dentener, J Feichter, F Raes, J van Aardenne, E Roeckner, U Lohmann, P Stier, and R Swart. 2008. “Influence of Future Air Pollution Mitigation Strategies on Total Aerosol Radiative Forcing.” Atmospheric Chemistry and Physics Discussions 8: 556305627.) [Natalie MAHOWALD, United States of America]	Noted. This is too detailed for this section, but the study of Wang et al. Is cited in Section 3.2.
16068	40	25	40	27	Please include a figure reference for this statement [Australia]	Accepted. Text revised
28254	40	25	40	34	The results on projections of heavy precipitation are missed in the SPM and ES. Please add "Regions that display statistically significant changes in heavy precipitation between 1.5°C and 2°C global warming are found in high-latitude (Alaska/Western Canada, Eastern Canada/Greenland/Iceland, Northern Europe, Northern Asia) and high-altitude (Tibetan Plateau) regions, as well as in Eastern Asia (including China and Japan) and in Eastern North America. Southern Asia is a hot spot for increases in heavy precipitation between these two global temperature levels" in ES and SPM. [Germany]	Noted. More material on the assessment of changes in heavy precipitation is now included in the ES.
28256	40	25	40	25	The meaning of robust must please be explained. [Germany]	Means significant. Seems well established. But may be clarified prior to publication.
3712	40	27			Delete ([Castor Muñoz Sobrino, Spain]	Accepted - Text was revised with the suggested edit
29436	40	27	40	27	Please review writing. [Joan A. Lopez-Bustins, Spain]	Accepted; text revised
39702	40	27	40	27	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Accepted; text revised
40220	40	27	40	27	the year in the reference "(Seneviratne et al.)" was missed, please add the missed year [Amal Hussein, Egypt]	Accepted; text revised
41544	40	27	40	27	extra space - 20C; [Sergio Aquino, Canada]	Accepted; text revised
50880	40	27	40	27	the ending paranthesis is missing in "(with stronger...." [Amjad Masood, Pakistan]	Accepted; text revised
62362	40	27	40	27	Please verify this reference "Seneviratne et al.)"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted; text revised
11990	40	29	40	30	Summary mentions Southern Asia as a hotspot for increases in heavy precipitation - this is not mentioned previously in the text. May be apparent from figures but needs a sentence in main text making this point. [United Kingdom (of Great Britain and Northern Ireland)]	The results are less robust (more model spread) for Southern Asia. Hence it is no longer mentioned. However, results for Southern Asia are provided in the cross-chapter box on 1.5 warmer worlds, to illustrate the spread of projections in some regions.
35282	40	29	40	30	I would sugest to include East Asia as a hot spot for increases in heavy precipitation as well because many studies showed the distinct signal in this region (Endo and Kitoh 2015; Freychet et al. 2015; Lee et al. 2018). Endo H and Kitoh A 2014 Thermodynamic and dynamic effects on regional monsoon rainfall changes in a warmer climate Geophys. Res. Lett. 41 1704-1711 404 doi:10.1002/2013GL059158 Freychet N, Hsu H H, Chou C and Wu C H 2015 Asian summer monsoon in CMIP5 projections: A link between the change in extreme precipitation and monsoon dynamics J. Clim. 28 1477-1493 Lee, D., S.-K. Min, E. Fischer, H. Shiogama, I. Bethke, L. Lierhammer, and J. Scinocca, 2018: Impacts of half a degree additional warming on the Asian summer monsoon rainfall". Env. Res. Lett., under revision. [Seung-Ki Min, Republic of Korea]	Accepted. Eastern Asia is now highlighted as hot spot (also in the executive summary).

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61858	40	29	40	29	Where is the integration between the finding that "Southern Asia is a hotspot for increases in heavy precipitation" and the aspects related to impacts and risks? Why not a box on this specific aspect as it is a clear signal from the physical science basis, which could motivate a highlight on the associated exposure and vulnerabilities across sectors? What about the vulnerable delta regions in southern Asia (increased risks due to heavy rainfall and sea level rise)? [Valérie Masson-Delmotte, France]	There is already a box on food security issues under 1.5°C over the Mekong Delta basin. It will be unbalanced to have another box on Southern Asia in this chapter.
49148	40	30	40	34	Although southern Asia has just been mentioned as a hotspot, it also displays statistically significant changes in heavy precipiattion and also deserves being part of this list [Bill Hare, Germany]	Rejected. After more careful examination, we decided not to highlight Southern Asia since it does not display robust changes towards more heavy precipitation in a large enough fraction of the models. But Southern Asia is highlighted in the cross-chapter box on 1.5° warmer worlds, since it is a region with substantial spread in the climate models.
1386	41		44		A box should not be longer than a page. Exceptionally, it can be on a left and right hand of a double page. Consider focusing on the most important figures only [Karen Olsen, Denmark]	Accepted. Text revised and figures removed in this version
6202	41		44		A box should not be longer than a page. Exceptionally, it can be on a left and right hand of a double page. Consider focusing on the most important figures only [Anne Olhoff, Denmark]	Accepted. Text revised and figures removed in this version
18286	41		44		A box should not be longer than a page. Exceptionally, it can be on a left and right hand of a double page. Consider focusing on the most important figures only [Andrea TILCHE, Belgium]	Accepted. Text revised and figures removed in this version
29734	41		67		The boxes are very interesting. They present very precise observations. However, the organisation is not very clear. It is difficult to understand why the boxes 3.2 "Sub saharan Africa"; 3.3 "Mediterranean basin; 3.4 "Paleontological evidence"; 3.5 "Climate tipping points" are positioned somewhere in the report and not somewhere else. [Capucine Pagniez, France]	Box 3.2 Subsaharan Africa is focus on changes in temperature and precipitation extremes. That's why it is located in the section 3.3
56630	41		44		a number of event attribution studies over east africa have been published recently looking at rainfall trends in observations and different models that are comparably thoroughly evaluated. Such studies could be used to assess confidence in the statements made in thses boxes. e.g. https://journals.ametsoc.org/doi/10.1175/JCLI-D-17-0274.1 http://onlinelibrary.wiley.com/doi/10.1002/joc.5389/full [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. This box is focus on precipitation and temperature changes at 1.5K and 2K. References proposed are not relevant.
49150	41	1	44	11	General comment on the box: The assessment seems to be incomplete in comparison with the exhaustivity of the previous paragraphs. There is for example almost no reference to future changes in heavy precipitation events. Is this meant as paragraph showing only future changes? Then it deserves a more specific title. Besides, references to the figures or studies supporting the stated results should be added. Right now it is difficult to link some of the presented results to the figures that are included in the box (e.g. changes in temperature in Southern Africa). In addition, more precisions on the methodology used to derive the results presented in the figures should be added. [Bill Hare, Germany]	Accepted. Text revised and the figures have been removed in this revised version. We added more insights from other sections.
61856	41	1	44	13	The box is an opportunity to integrate between regional aspects of climate changes but also impacts and risks for this region. Please use the regional boxes for "hotspots" of "clear projected climate changes" or risks (considering also impacts and vulnerabilities). [Valérie Masson-Delmotte, France]	Accepted. Text revised
13574	41	3	41	19	The boxs 3.2 figure 1 shows the changes in temperature but not in precipitation. [Chile]	Accepted. All figures have been deleted in this revised version
39704	41	3	41	3	Insert a new line below line 3. [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
56622	41	3	41	19	I can see neither dots nor hatching, is there none? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. All figures have been deleted in this revised version
57628	41	3	43	17	Could this box be expanded as a case study ie include the impacts and risks of changes in climate? As it stands only climatic changes are presented and leaves the reader wondering whether one should be concerned about these or not??? [Hans Poertner, Germany]	Accepted. Text revised with more insights from other parts of the chapter.
62364	41	3	41	18	The quality of this Box 3.2 is wonderful; the figure has also a good quality resolution [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Text revised. All figures have been removed
13942	41	6	41	13	Again, a great figure (Box 3.2, figure 1). However, please explain what the extent of the boxes and ranges mean statistically in the figure caption. [Natalie MAHOWALD, United States of America]	Accepted. All figures have been deleted in this revised version
44940	41	6	41	6	Show the definition of 'hot nights'. [Hiroaki Kondo, Japan]	Rejected. A box should not be longer than 1 page. Please see definition if Weber et al. 2018 (90th percentile of daily minimum temperature of the reference period 1971-2000).
49152	41	6	41	12	What is the mentioned "regional model ensemble"? Is it from CORDEX? Also, it is difficult to discern the points and the hatching [Bill Hare, Germany]	Yes we were referring to CORDEX. Accepted. Text revised and all figures have been removed in the revised version
3524	41	7	41	8	I can't see dotted and hatched lines in the maps. [David Docquier, Belgium]	Accepted. All figures have been deleted in this revised version
28258	41	7	41	9	„Dotted areas indicate the exceedance of the single standard deviation; hatched areas indicate the exceedance of the double standard deviation.“ None of them are visible in the figures. Please adapt figure legend or enhance figures in such a way that dots and hatches become visible. [Germany]	Accepted. All figures have been deleted in this revised version
3526	41	9			17th and 83th percentiles are weird values. You need a justification. [David Docquier, Belgium]	Accepted. Text revised and all figures have been removed
7526	41	12	41	12	…Weber et al. … publication year missing [Jens Zinke, Germany]	Accepted text revised
24154	41	12	41	12	Weber et al. ---> Missing reference year [Mustafa Tufan Turp, Turkey]	Accepted text revised
28260	41	12	41	12	The term "scenario" should not be used in this context; "warming periods" is more suitable. [Germany]	Accepted text revised
39706	41	12	41	12	Add "submitted" to "Weber et al." [Hernan Edgardo Sala, Argentina]	Accepted text revised
50882	41	12	41	12	year of publication is missing in reference in "Weber et al." [Amjad Masood, Pakistan]	Accepted text revised
62366	41	12	41	12	Please verify this reference "Weber et al."; the year is missing and it should be put in backets… [JACQUES-ANDRE NDIONE, Senegal]	Accepted text revised
6496	41	14	41	14	Africa Continent' should be 'African Continent' [Robert Shapiro, United States of America]	Accepted. Text revised
17346	41	14	41	14	Replace "Africa" with "African". [David Schoeman, Australia]	Accepted. Text revised
50884	41	17	41	17	...global temperature is kept... instead of "...global temperature is kept..." [Amjad Masood, Pakistan]	Accepted. Text revised
56290	41	17	41	17	Change "are" to "is". [Annika Herbert, Australia]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
51098	41	18	44	35	Please refer also to AR5 as there is interesting information about drought. Also try to avoid unbalance in regional information included [Fatima Driouech, Morocco]	In the paragraph on South Africa, we will add a sentence prior to publication that a conclusion of AR5 (medium to high confidence) is that the reduction in precipitation is likely over the southwestern parts of South Africa by the end of the 21st century under the SRES A1B and A2 scenarios. In the paragraph on East Africa, we will add a sentence prior to publication that it was shown in AR5 that over the Ethiopian Highlands, downscaled projections indicated likely increases in rainfall and extreme rainfall by the end of the 21st century. On the balance between regions: the text has been shortened and the balance between paragraphs has been respected in this revised version.
28262	42	1	42	1	Please improve the quality of figure 2 in box 3.2. [Germany]	Accepted. Text revised and figures removed
30456	42	1	42	11	Box 3.2. Figure 2 : The poor quality of the figure does make it possible to assess its understandability [France]	Accepted. Text revised and figures removed
39964	42	1	42	1	Really low quality of the figure [Adi Nugraha, United States of America]	Accepted. Text revised and figures removed
44942	42	1	42	4	Although Box 3.2 Figure 2 is not clear, what is DTg in line 4? [Hiroaki Kondo, Japan]	Accepted. Text revised and figures removed
46894	42	1	42	11	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Accepted. Text revised and figures removed
46896	42	1	42	11	Difficult to read graphs when printed to A4 paper. [Sarah Connors, France]	Accepted. Text revised and figures removed
56624	42	1	42	18	the caption and labels and text in the box do not seem to fit. It is also not clear how exactly the regions are defined. Why is the uncertainty in the sampling so much lower in figures a) in central africa and the Guinean coast? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised and figures removed
62368	42	1	42	1	Please, improve the quality of figure 2, Box 3.2 [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Text revised and figures removed
13944	42	3	42	10	Box 3.2, figure 2: this figure seems to have too much white space. [Natalie MAHOWALD, United States of America]	Accepted. Text revised and figures removed
28264	42	3	42	5	„Top: Scaling plots of ?Tg against regional temperature ?T (in y axis labels) averaged across the WAF domain (top) and all of its sub regions“. First, the figure nowhere displays an average across the “WAF domain”, only for the mentioned sub regions. Second, not „regional temperature ?T“ is displayed on the y-axis, but presumably some sort of precipitation (axis title is "?PRCPTOT (mm)"). Something went wrong here. Was perhaps the „top“ of the original figure removed without adapting the text? Is there a mistake in the figure legend? Please check. [Germany]	Accepted. Text revised and figures removed
49154	42	3	42	11	What does the model spread refer to? Please show zero-change lines for clarity purpose [Bill Hare, Germany]	Accepted. Text revised and figures removed
50592	42	3	42	3	Figure 2: Top panel (WAF) is missing; y-label in a) refers to precipitation, not temperature; is this just a placeholder figure? [Jacob Schewe, Germany]	Accepted. Text revised and figures removed
7530	42	7	42	7	…(contribution of very wet days at 99th percentile)… wrong spelling [Jens Zinke, Germany]	Accepted. Text revised
6498	42	8	42	8	et' should be 'and' [Robert Shapiro, United States of America]	Accepted. Text revised
7528	42	11	42	11	Diedhiou et al. publication year missing [Jens Zinke, Germany]	Accepted. Text revised
24156	42	11	42	11	Diedhiou et al.---> Missing reference year [Mustafa Tufan Turp, Turkey]	Accepted. Text revised
39708	42	11	42	11	Add "submitted" to "Diedhiou et al." [Hernan Edgardo Sala, Argentina]	Accepted. Text revised
50886	42	11	42	11	year of publication is missing in reference in "Diedhiou et al." [Amjad Masood, Pakistan]	Accepted. Text revised
62370	42	12	42	12	Please verify this reference "Diedhiou et al."; the year is missing and it should be put in backets… [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Text revised
13946	42	13	42	13	There is very good evidence that close to the ITCZ, the biggest impacts on precipitation will come from aerosol changes, especially in the Sahel (e.g. Wang et al, 2016, above, but more: Biasutti, M., & Giannini, A. (2006). Robust Sahel drying in response to late 20th century forcings. Geophysical Research Letters, 33(L11706), doi:10.1029/2006GL026067.. This has important implications for future climate projections, because these shifts are not from GHG increases, and thus when the aerosols go down, as we hope, the precipitation should recover in these regions. So I find this regional impact analysis, as well as many in the AR5, to be missing this key point. [Natalie MAHOWALD, United States of America]	Accepted. However the box is focus on temperature and precipitation extremes under 1.5c and 2°C.
28266	42	14	42	17	Beyond the length of wet spells and the intensity of rainfall, analysing the distribution of days experiencing rainfall during a rainy season is absolutely essential for landuse and particularly agriculture (generally and especially in drylands). This aspect needs to be considered when discussing climate change. See: Akhtar-Schuster, M & Kirk, M & Gerstengarbe, F & Werner, P. (2000). Causes and impacts of the declining resources in the eastern Sahel. Desertification Control Bulletin. 36. 35-42. [Germany]	Noted. But the box is focus on temperature and precipitation under 1.5°C and 2°C
7532	42	17	42	17	…Klutse et al… publication year missing [Jens Zinke, Germany]	Accepted. Text revised.
24158	42	17	42	17	Klutse et al.---> Missing reference year [Mustafa Tufan Turp, Turkey]	Accepted. Text revised
39710	42	17	42	17	Add "submitted" to "Klutse et al." [Hernan Edgardo Sala, Argentina]	Accepted. Text revised
40222	42	17	42	17	the year in the reference "(Klutse et al.)" was missed, please add the missed year [Amal Hussein, Egypt]	Accepted. Text revised
50888	42	17	42	17	year of publication is missing in reference in "Klutse et al." [Amjad Masood, Pakistan]	Accepted. Text revised
62372	42	17	42	17	Please verify this reference "(Klutse et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Text revised
46898	43		43		Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Accepted. Text revised and figures removed
56626	43				the color scales is unreadable for red-green blind people. Again the lables and captions don't mtch so it's unclear what the purpose of the box actually is. [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised and figures removed
16070	43	1	43	5	The maps are labeled as Precipitation but the caption says the top row is temperature. [Australia]	Accepted. Text revised and figures removed
28268	43	1	43	1	The text in the caption does not agree with the figure (comparison of tas and pr for same season or same variable for different seasons?). Please check. [Germany]	Accepted. Text revised and figures removed
44944	43	1	43	1	I think the color scales of second, third and forth column is the same. Then, it is not necessary to put two scales under the second and third column, and under the forth column. [Hiroaki Kondo, Japan]	Accepted. Text revised and figures removed

Comment No	From Page	From Line	To Page	To Line	Comment	Response
56762	43	1	43	1	Need to check Box 3.2, Figure3. Based on the caption, the figrue on the top should be "temperature" instead of "precipitation"? [Xiaolin Zhang, China]	Accepted. Text revised and figures removed
62374	43	1	43	17	It would be good to have the same quality than figure Figure 1, in Box 3.1… Please improve the quality of these two figures. [JACQUES-ANDRE NDIONE, Senegal]	Accepted. Text revised and figures removed
17348	43	2	43	5	The figure caption talks about temperature (and misses the degree symbol), while the y-axis refers to precipitation [David Schoeman, Australia]	Accepted. Text revised and figures removed
44946	43	2	43	10	I think both of top and bottom rows of Box.3.2 Figure 3 indicate precipitation for each season and don't indicate temperature. [Hiroaki Kondo, Japan]	Accepted. Text revised and figures removed
7534	43	5	43	5	...Maúre et al… publication year missing [Jens Zinke, Germany]	Accepted. Text revised
50890	43	5	43	5	year of publication is missing in reference in "Maure et al." [Amjad Masood, Pakistan]	Accepted. Text revised
49156	43	7	43	8	It should be specified what the mentioned numbers refer to [Bill Hare, Germany]	Accepted. Text revised
6500	43	11	43	11	aswell as in parts' should be 'as well as in parts' [Robert Shapiro, United States of America]	Accepted. Text revised
7536	43	11	43	11	...Maúre et al… publication year missing [Jens Zinke, Germany]	Accepted. Text revised
10684	43	11	43	11	Change to '...in Zambia, as well as in parts of Western Cape, ….' [Franklin Paredes, Brazil]	Accepted. Text revised
17350	43	11	43	11	Replace "aswell" with "as well". [David Schoeman, Australia]	Accepted. Text revised
50892	43	11	43	11	...Zambia. as well as instead of "...Zambia. aswell as" [Amjad Masood, Pakistan]	Accepted. Text revised
28270	43	15	43	15	Please spell out the names of climate indices (CDD, CWD) in the caption of figure 4. [Germany]	Accepted. Text revised and figure removed
30998	43	16	43	17	The colour scheme on this figure is particularly lurid [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised and figure removed
49158	43	17	44	11	The legend of the figure is referring to annual changes in CDD and CWD, but the text below mentions changes within rainy seasons. Please check for consistency. [Bill Hare, Germany]	Accepted. Text revised and figure removed
17832	44				Drought and Dryness in Mid-Latitude Region is also serious and is causing to shortage of food and also desertification. These drought problems in Mid-Latuitude should be added here./Wang, S.W., Lee, W.K., Son, Y. 2017. An assessment of climate change impacts and adaptation in South Asian agriculture. International Journal of Climate Change Strategies and Management 9(4):517-534./ Kafatos, M., Kim, S.H., Lim, C.H., Kim, J., Lee, W.K. 2017. Responses of Agroecosystems to Climate Change: Specifics of Resilience in the Mid-Latitude. Sustainability. 9(8):1361./Lamchin, M., Lee, W. K., Jeon, S. W., Wang, S. W., Lim, C. H., Song, C., Sung, M. 2017. Long-term trend and correlation between vegetation greenness and climate variables in Asia based on satellite data. Science of the Total Environment./Lim, C.H, Kim, S.H., Choi, Y., Kafatos, M.C., Lee, W.K. 2017. Estimation of Virtual Water Content of Main Crops on the Korean Peninsula Using Multiple Regional Climate Models and Evapotranspiration Methods. Sustainability 9:1172. [Republic of Korea]	Rejected. This box is focus on precipitation and temperature changes at 1.5K and 2K. References proposed are not relevant.
28272	44	2	44	2	Do you mean "control period" or "control climate"? In the latter case, please specify what is meant by "control climate" [Germany]	Accepted. Text revised with more insights from other parts of the chapter.
7538	44	5	44	6	…Osima et al. publication year missing [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
39712	44	5	44	6	Please, check the citation of "Osima" (it has not title, see page 228, line 54). [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
21810	44	6			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted. Text revised and figure removed
50894	44	6	44	6	year of publication is missing in reference in "Osima et al." [Amjad Masood, Pakistan]	Paper was submitted at the moment of SOD's preparation. Now it has been accepted. Reference has been corrected.
7540	44	8	44	8	...Annual rainfall.. komma after Annual deleted [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
56628	44	8	44	11	Given the so called east africa paradoxon, how reliable are these estimates? Why is there no use of calibrated language in the boxes? [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted; the text has been updated and focus only on robust results (or on results with less uncertainties): medium confidence
9610	44	16	48	43	The passage on drought seems a little confusing and internally inconsistent, and parts of it may also be inconsistent with the peer-reviewed literature. One example: it seems to imply that no systematic increases in drought have occurred in the US southwest as a result of climate change, and that it is a low-risk region for future climate change-driven drought increases - but the American desert southwest is commonly viewed as a very high-risk area for increased drought and water pressures under global anthropogenic climate change. See for example (and cite) US Bureau of Reclamation (SECURE Water Act Section 9503(c) - Reclamation Climate Change and Water, Report to Congress, 2011) (report is available online). [Sean Fleming, United States of America]	The passage on drought has been rephrased substantially
16072	44	16	44	37	Suggest rephrase to say there's low confidence in our ability to distinguish between 1.5 and 2C scenarios for drought and dryness. [Australia]	Not applicable. Text was sufficiently revised.
49428	44	16	48	43	Consider to expand the section 3.3.4 (Drought and dryness) by including a review on natural fire response on 1.5ºC warming (as forest fires are one of the major hazards associated with climate change). The section name can be formulated as: Drought, dryness and natural fires The following literature can be reviewed: Hantson et al., 2016, doi: 10.5194/bg-13-3359-2016 (review on current status of global fire modeling); Wu et al., 2015, doi: 10.1002/2015JG003036 (fires in Europe under climate change); Eliseev et al., 2014, doi: 10.5194/bg-11-3205-2014 (global view on projected forest fire changes, Bayesian approach); Clarke et al., 2016, doi: 10.1007/s10584-016-1808-9 (fires in Australia); Hu et al., 2015 doi: 10.1890/150063 (fires in the Arctic tundra). The following literature can be also used in the 3.4.3.4. and 3.5.2.2.4 sections. [Alexander Chernokulsky, Russian Federation]	Rejected. Wildfires are more relevant to Sec. 3.4.
3530	44	18	44	37	It might be relevant to define droughts in all these studies, because the definition of drought might have an impact on the results. [David Docquier, Belgium]	Not enough space to provide this background. However, if considered critical could clarify this point prior to publication, at least in the Annex (e.g. with reference to the SREX chapter 3, which extensively addressed this point)
54370	44	19	44	19	Drought should be defined right from the beginning as it can be defined in sevral way [Robert Vautard, France]	Accepted. Will add a sentence with a definition prior to publication.
5520	44	21	44	24	literature is mentioned, but no literature is cited? Suggest citing literature or removing the mention of literature. [Haroon KHESHGI, United States of America]	Not applicable. Text was sufficiently revised.
49160	44	21	44	24	If this sentence refers to changes in global drought patterns, then it should be specified for clarity purposes [Bill Hare, Germany]	Accepted - Text was revised
6502	44	23	44	23	and based on' should be 'based on' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62068	44	23	44	25	recent paper propose the opposite of what is said in this subsection. In fact, paper cited in below highlight that in the wet and dense vegetated areas, the vegetation expansion would mitigate the drying trend. The reason for this difference is due to the higher transpiration rates in the vegetated regions, which aggravates the water deficit in dry regions. In wet regions, the vegetation would store more water. (Scientific Reports volume 6, Article number: 32782 (2016); doi:10.1038/srep32782) [Rachid MOUSSADEK, Morocco]	Not applicable. Text was sufficiently revised.
17352	44	24	44	25	Is it not the other way around, with drought related to temperature? [David Schoeman, Australia]	Not applicable - This text was deleted
49162	44	24	44	25	It might be useful to readers if this paragraph could expand briefly on why temperature can only be indirectly related to drought trends [Bill Hare, Germany]	This text was removed. Will consider adding a bit more background in the Annex prior to publication.
50992	44	24	49	25	The sentence "In regions affected by seasonal or chronic water scarcity, agricultural yieldsare strongly dependent on irrigation" is missing some word [Fatima Driouech, Morocco]	Not applicable - This section was rewritten
39714	44	25	44	25	Insert a comma after the point in: "Sheffield et al. 2012". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
5518	44	27	44	29	It is not clear what in the AR5 is being revised. Suggest providing the AR5 conclusion, and this chapter's conclusion and citing the literature to justify this change. [Haroon KHESHGI, United States of America]	Not applicable - This text was deleted.
41334	44	27			It is suggested that the statement regarding recent analysis not supporting AR5 assessments be rephrased to make it clearer [Lourdes Tibig, Philippines]	Not applicable - This text was deleted
43264	44	27	44	29	Important point - do not remove. [Edward Byers, Austria]	Not applicable - This text was deleted.
53088	44	29	44	29	This simple concept mostly based on oceanic data, that dry regions get drier while wet regions get wetter changes over land, which is not supported by assessments of observed trends in continental dryness which yield contradicting results (see Dai, 2011; Sheffield et al., 2012). Furthermore, Greve et al. (2014) could not detect robust dryness changes over ¾ of the global land area. They concluded that aridity changes over land have not followed the above simple concept because only 10.8% of the global land area shows a robust 'dry gets drier, wet gets wetter' pattern, compared to 9.5% of global land area showing the opposite pattern. Endris HS, Omondi P, Jain S et al (2013) Assessment of the performance of CORDEX regional climate models in simulating East African rainfall. J Clim. https ://doi.org/10.1175/JCLI-D-12-00708 [Thian Gan, Canada]	Not applicable - This text was deleted
7886	44	35	44	45	Results of RCM simulations at regional scales should be used to assess projections of changes in drought and dryness in Mediterranian region, even if large scale drought is generally related to synoptic conditions or oscillations. [khadija kabidi, Morocco]	This comment is speculative and not supported by references
62070	44	35	44	37	It's better of author emphasis that some part of the Mediterranean region (south and eastern) have more propoability of drought than North part of this region. In fact, My country (Morocco) have more frequency of drought than France or Greece as exemple. recent publication (see below) studied this issue in deep (Benjamin I Cook, Kevin J Anchukaitis, Ramzi Touchan, David M Meko, Edward R Cook. Spatiotemporal drought variability in the Mediterranean over the last 900 years. Journal of Geophysical Research: Atmospheres, 2016; DOI: 10.1002/2015JD023929) [Rachid MOUSSADEK, Morocco]	Accepted - This is now discussed in more detail in Box 3.2.
53090	44	37	44	37	Droughts in arid and semi-arid regions could be exacerbated by desertification. Desertification means serious land degradation in dry sub-humid, semi-arid and arid lands resulting from climate variability, climate change and anthropogenic activities especially over-exploitation of land. The increased frequency and severity of droughts resulting from projected climate change could likely further exacerbate desertification, which lead to vegetation loss, reducing carbon sinks, increasing emissions from rotting plants, resulting more greenhouse gases and so a positive feedback. Furthermore, vegetation loss increases surface-albedo which increases radiative losses and enhance cooling, and the result is decreased rainfall, further promoting desertification and droughts, another positive feedback, as supported by GCM studies conducted on African deserts. In other words, climate perturbation by persistent high temperature, irregular rainfall, and higher albedo via vegetation decline could enhance desertification (e.g., Nicholson et al., 1998). Desertification can also be caused by the persistent degradation of arid, semi-arid and sub-humid areas by human activities, including unsustainable farming, mining, overgrazing and clear-cutting of land, wind and water erosion that carry away topsoil and leaving behind a highly infertile mix of dust and sand. Nicholson, S. E., Tucker, C. J., & Ba, M. B. (1998). Desertification, drought and surface vegetation: an example from the west African Sahel, Bull. American Met. Soc., 79, 815e829. [Thian Gan, Canada]	Noted – However, this comment is more relevant to Sec. 3.4 and thus not directly relevant to this section.
13010	44	40	48	43	This part shows good findings, but is not written like an assessment. We read "this paper show that, this other paper shows that". My suggestion is to organize the paper by main finding (the summary), the references should support the findings (and not the reverse...). [Eric Martin, France]	Accepted – The passage on drought has been rephrased substantially
35068	44	40	44	40	Following relevant study can also be cited in the section : Total runoff (including surface and subsurface runoff) would decrease across all land surfaces, but most significantly in drylands with a GMSW from 1.5 ?C to 2.0 ?C (Fig. 4b), indicating that water shortage in drylands could become more severe. References: Jianping Huang, Haipeng Yu , Aiguo Dai, Yun Wei and Litai Kang (2017). Drylands face potential threat under 2 ?C global warming target. Nature Climate Change ,7, pages417–422 [Shaukat Ali, Pakistan]	Accepted - It might be useful to cite the mentioned reference (maybe in Sec. 3.3.4.2, paragraph 2 f))
43270	44	40	44	40	I think this section should include reference to this study which was an important multi-model assessment : Prudhomme, C., Giuntoli, I., Robinson, E.L., Clark, D.B., Arnell, N.W., Dankers, R., Fekete, B.M., Franssen, W., Gerten, D., Gosling, S.N. and Hagemann, S., 2014. Hydrological droughts in the 21st century, hotspots and uncertainties from a global multimodel ensemble experiment. Proceedings of the National Academy of Sciences, 111(9), pp.3262-3267. Vancouver [Edward Byers, Austria]	Accepted - It might be useful to cite the mentioned reference (maybe in Sec. 3.3.4.2, paragraph 2 f))

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49164	44	40	48	43	General comment about this section: regional results could be discussed more in detail, for example the only interpretation of Fig. 3.15 is "We note the large disparity of responses depending on the considered regions". It would be useful to highlight that the increases in CDD over Southern Africa, the Mediterranean area, Northeastern Brazil are consistent with the projected changes in water availability from Fig. 3.14. Besides, the Amazon region is also projected to experience both a decrease in water availability (according to Fig. 3.14 but not 3.16) and an increase in CDD, but is never mentioned in this section. For regions where there is contradicting evidence from different indices, it may be useful to repeat this in the description of Fig. 3.16. Finally, the assessment of significance of the results focuses on the difference in the impacts at 1.5 and 2°C; but would it be possible to get some information on the significance of impacts at 1.5 or 2°C compared to historical levels? [Bill Hare, Germany]	Noted. Will consider if some edits and further background are needed prior to publication
1792	44	42	44	43	Can you give an example of drought indices which lead to different conclusions regarding projected changes in drought and dryness? [Greece]	Not applicable - This text was rephrased
21812	44	43			in any citation the authors and publication year must be separated by a comma (two cases in this line) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
39716	44	43	44	43	Insert a comma after the point in: "Seneviratne et al. 2012" and insert a comma after "2013" in: "Orlowsky and Seneviratne 2013". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
7092	44	47			submitted and published" sounds strange; I would omit these words at all. [Dmitry L. Musolin, Russian Federation]	Accepted - Text was revised with the suggested edit
13008	44	47	44	47	Some submitted : an IPCC report should report on published littérature [Eric Martin, France]	All literature cited in the current version is now published
41336	44	47	45	5	Same comment as above re using "submiited and published literature" [Lourdes Tibig, Philippines]	Accepted - Text was revised with the suggested edit
18288	44	49	44	49	The work of Naumann et al. (2018) is relevant here. This paper assesses global changes in drought characteristics (based on the Standardized Precipitation Evapotranspiration Index) under different warming levels, including an assessment of the related uncertainties. 20% of the global land surface, drought magnitude will halve with warming of 1.5°C and higher levels. A progressive and significant increase in frequency of droughts is projected with warming in the Mediterranean basin, most of Africa, West and Southern Asia, Central America and Oceania, where droughts are projected to happen 5 to 10 times more frequent even under ambitious mitigation targets. Naumann, G., Alfieri L., Wyser K., Mentaschi, L., Betts, R.A., Carrao, H., Spinoni, J., Vogt, J., and Feyen, L., 2018. Global changes in drought conditions under different levels of warming. Revised manuscript (minor revision) submitted to Geophysical Research Letters on February 1, 2018. [Andrea TILCHE, Belgium]	Accepted – It might be useful to cite the mentioned reference (maybe in Sec. 3.3.4.2, paragraph 2 d)). Will be considered for addition prior to publication
21814	44	49			in any citation the authors and publication year must be separated by a comma (two cases in this line) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
1388	45				Impossible to grasp this figure - delete all but the main figure [Karen Olsen, Denmark]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially
6204	45				Impossible to grasp this figure - delete all but the main figure [Anne Olhoff, Denmark]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially
18290	45				Impossible to grasp this figure - delete all but the main figure [Andrea TILCHE, Belgium]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially
29348	45		45		Figure 3.14 is hard to read. I would suggest to identify the regions with numbers (similarly to figure 3.15) instead of arrows [Borbala Galos, Hungary]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially
54694	45				Fig 3.14, axis titled and legend not easily visible [Qudsia Zafar, Pakistan]	The figure is now provided in better quality
21816	45	4			insert space between "2016d),see" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
39718	45	4	45	4	Insert space after the comma in: "...2016d),see..." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
49166	45	4	45	4	It is not clear what "these analyses are overall consistent" means without reading hte rest of this section - perhaps a sentence explaining that further detail is given below could be added? [Bill Hare, Germany]	Accepted - Text was revised with the suggested edit
43266	45	7	45	25	Good section - figure is very easy to understand [Edward Byers, Austria]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially
53092	45	7	45	8	Potential ET or Actual ET? I believe it should be PET? Also, explain what is modified pattern scaling approach. [Thian Gan, Canada]	Accepted - The authors used actual evapotranspiration, which is now mentioned in the text. The term „modified“ is now removed and the approach is outlined in the subsequent sentence.
28274	45	8	45	9	Does "full range of emission scenarios" mean that the analysis has been performed over different scenarios? If yes, please include a reference to the ongoing debate whether scenarios representing different possibilities of the future can be meaningfully analysed together. Else please reformulate to clarify what has been done. [Germany]	Rejected. This means that simulations with all four emissions scenarios from CMIP5 are considered. However, adding more details would take too much space.
53094	45	13	45	15	I am not sure about the statement, given sources of uncertainties associated with climate projections are many, such as uncertainties due to climate modeling which is related to the choice of climate models, greenhouse gas emissions, radiative forcings, etc.? I suggest re-phrasing this sentence. [Thian Gan, Canada]	Accepted – The sentence was rephrased. The authors in Greve et al. (2018) and Wartenburger et al. (2018) use a simplified approach to distinguish between three potential sources of uncertainties. The authors clearly acknowledge that their approach is simplified, neglects potential dependencies between uncertainty sources and could only provide a first order assessment of uncertainty sources.
10320	45	14	45	15	The uncertainty stemming from the climate model choice undoubtedly depends on the lead time. It should be included in the sentence. [Hungary]	Rejected. Too detailed.
44364	45	15	45	15	Reference formatting issue [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
50896	45	15	15	15	...(Greve et al., 2017). instead of "...Greve et al. (2017)." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
5380	45	19	45	20	The picture is too small. Content and text is not clear. Suggest to serve on one page full. [Sulistyawati Sulistyawati, Indonesia]	Editorial - copyedit to be completed prior to publication
39966	45	19	45	19	Legend and axis are not visible. Please improve the quality of the figure [Adi Nugraha, United States of America]	Editorial - copyedit to be completed prior to publication
30458	45	19	45	24	Figure 3.14 : The poor quality of the Figure does not make it possible to assess its consistence with the conclusions [France]	Editorial - copyedit to be completed prior to publication
46900	45	19	45	24	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Accepted. Will be checked for final version and possibly edited prior to publication.
62376	45	19	45	20	Figure 3.14 needs improvements; teh quality is not good. [JACQUES-ANDRE NDIONE, Senegal]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially

Comment No	From Page	From Line	To Page	To Line	Comment	Response
3528	45	20			Figure 3.14: I suggest to remove this figure as the resolution is very poor and there is no substantial added value. The paragraph above this figure seems sufficient. Interested readers will go to Greve et al. (2017). [David Docquier, Belgium]	The figure is now provided in better quality. Both the corresponding text and caption have been extended substantially
28276	45	21	45	24	Does "full range of emission scenarios" here mean that the analysis has been performed over different scenarios. If yes, please include a reference to the ongoing debate whether scenarios representing different possibilities of the future can be meaningfully analysed together. Else please reformulate to clarify what has been done. [Germany]	Rejected. This means that simulations with all four emissions scenarios from CMIP5 are considered. However, adding more details would take too much space.
40224	45	21	45	21	Figure 3.14 itself is not clear for the readers [Amal Hussein, Egypt]	Editorial - copyedit to be completed prior to publication
53096	45	25	45	25	Explain the difference between empirical versus pattern scaling. [Thian Gan, Canada]	Rejected. Statistical pattern scaling is a pattern scaling derived from linear regression. Empirical pattern scaling (also called "time sampling approach") is derived empirically for different levels of global warming, it does not presuppose a linear dependency. The difference between the two approaches can be inferred from the cited publications, and is also explained in Section 3.2
7542	45	27	45	27	...(2017a), which uses.. insert space after comma [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
9190	45	27			Please change "(2017a),which" to "(2017a), which" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
50898	45	27	45	27	(2017a), which uses an Empirical Scaling Relationship (ESR).... instead of "(2017a),which uses an empirical scaling relationship (ESR)...." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
56292	45	28	45	28	Remove "with". [Annika Herbert, Australia]	Editorial. Revision could be considered prior to publication (or possibly splitting of sentence in two parts to avoid confusion).
53098	45	29	45	29	Which version of PDSI, for there are several versions of PDSI, such as the Palmer's original algorithm (orPDSI), the self-calibrating PDSI (scPDSI), and a version modified for Canadian Prairie conditions (cpPDSI) (e.g., Gobena and Gan, 2013)? Gobena and Gan, 2013, Assessment of Trends and Possible Climate Change Impacts on Summer Moisture Availability in Western Canada based on Metrics of the Palmer Drought Severity Index, Journal of Climate, AMS, 26(13), 4583-4595. DOI: 10.1175/JCLI-D-12-00421.1 [Thian Gan, Canada]	Not applicable - Detailed information is available in the original study. The authors use a Penman-Monteith based Palmer Drought Severity Index.
35070	46		46		Following study should be cited in the section: If warming is limited to 2°C, the simulations suggest little change in drought risk for the U.S. Southwest and Central Plains compared to present day. In the Mediterranean and central Europe, however, drought risk increases significantly for both 1.5°C and 2°C warming targets, and the additional 0.5°C of the 2°C climate leads to significantly higher drought risk. References: Flavio Lehner, Sloan Coats, Thomas F. Stocker, Angeline G. Pendergrass, Benjamin M. Sanderson, Christoph C. Raible, Jason E. Smerdon (2017). Projected drought risk in 1.5°C and 2°C warmer climates. Geophysical research Letters, 44, Pages 7419–7428 [Shaukat Ali, Pakistan]	Accepted – The suggested study is cited in the revised text
10322	46	1	46	1	Do we mean here consecutive drought years? In all other parts of the section it is CDD (consecutive dry days). It should be defined or clarified which one do we mean here. [Hungary]	Accepted - In the revised text this passage is quoted
53100	46	1	46	3	I suggest to also discuss droughts in Africa, the driest continent. For example, Dile et al. (2013) suggested that the streamflow of the Gilgel Abay River, which is located in the Lake Tana basin, is projected to increase for the 2070–2100. In contrast, based on the IPCC-SRES A2, A1B, and B1 scenarios of several GCMs, Setegn et al. (2011) suggested that the streamflow of Lake Tana basin, which is the source of the Blue Nile, is mostly projected to decline for the 2080–2100. For the whole Nile basin, for which Ethiopia contributes the majority of its annual runoff, Beyene et al. (2010) simulated an increase in its streamflow for 2010–2039, followed by a consistent decrease for 2040–2069 and 2070–2099 periods. Liersch et al. (2016) also found an overall projected increase in the mean annual discharge of the Upper Blue Nile, and Gizaw et al (2017) projected annual streamflow in Awash, Baro, Tekeze rivers and Genale river are projected to increase in the 2050s and 2080s. which suggested some possible causes for differing flow projections. Beyene T, Lettenmaier DP, Kabat P (2010) Hydrologic impacts of climate change on the Nile River Basin: implications of the 2007 IPCC scenarios. J of Climate Change 100:433–461. doi:10.1007/s10584-009-9693-0. Dile YT, Berndtsson R, Setegn SG (2013) Hydrological response to climate change for Gilgel Abay River, in the Lake Tana Basin—Upper Blue Nile Basin of Ethiopia. PLoS One 8(10):e79296. doi:10.1371/journal. pone.0079296. Liersch S, Tecklenburg J, Rust H, Dobler A, FischerM, Kruschke T, Koch H, Hattermann F (2016) Are we using the right fuel to drive hydrological models? A climate impact study in the Upper Blue Nile. Hydrol Earth Syst Sci Discuss. doi:10.5194/hess-2016-422. Gizaw, M., Biftu, G., Gan, T. Y., Moges, S., and Koivosalo, H., 2017, Potential Impact of climate change on streamflow of major Ethiopian rivers, Climatic Change, DOI: 10.1007/s10584-017-2021-1. Setegn SG, Rayner D, Melesse AM, Dargahi B, Srinivasan R (2011) Impact of climate change on the hydroclimatology of Lake Tana Basin. Ethiopia Water Resour Res 47:W04511. doi:10.1029/2010WR009248 [Thian Gan, Canada]	Noted. Too detailed, cannot be included
50900	46	2	46	2	show.. instead of "shows..." [Amjad Masood, Pakistan]	Editorial - copyedit to be completed prior to publication
53102	46	4	46	4	Under downscaled RCP4.5 and RCP8.5 climate scenarios, Tariku and Gan (2018) projected the annual precipitation of Blue Nile, Atbara, and Sobat river basin, Bahar El Ghazal and Lake Victoria regions to change by about [? 7, 14.2], [? 19, 25.3], [? 7, 39], [? 5.9, 23], and [3.6, 27] % in the 2050s, and [? 14, 25], [? 22.5, 39], [? 4.7, 60.4], [? 11, 31], and [11.8, 41] % in the 2080s, respectively. The mean annual air temperature for sub-basins of NRB is projected to increase by 2–2.5 °C in the 2080s under RCP4.5, and by 3.9–4.6 °C in the 2080s under RCP8.5, respectively. Most precipitation extreme indices investigated are projected to increase, which implies that NRB could experience more severe and frequent extreme precipitation in future. Tariku, T. B., and Gan, T. Y., 2018, Regional Climate Change Impact on Extreme Precipitation and Temperature o the Nile River Basin, Climate Dynamics, DOI : 10.1007/s00382-018-4092-8. [Thian Gan, Canada]	Not applicable – Precipitation extremes are assed in Sec. 3.3.3.
28278	46	6	45	10	Figure 3.15 presents a lot of information; there should be more text on this figure to explain the content in more detail. [Germany]	Not sure what information to add. The analyses are similar to others provided for extreme temperature and heavy precipitation elsewhere in the chapter.
50902	46	6	46	6	Consecutive Dry Days (CDD) instead of "consecutive dry days (CDD)" [Amjad Masood, Pakistan]	Not applicable - This text was deleted
1390	47		48		See previous comments on figures [Karen Olsen, Denmark]	Editorial - copyedit to be completed prior to publication
6206	47		48		See previous comments on figures [Anne Olhoff, Denmark]	Editorial - copyedit to be completed prior to publication
18292	47		48		See previous comments on figures [Andrea TILCHE, Belgium]	Editorial - copyedit to be completed prior to publication
50904	47	3	47	3	Consecutive Dry Days (CDD) instead of "consecutive dry days (CDD)" [Amjad Masood, Pakistan]	Not applicable - This text was deleted
7544	48	3	48	3	…after Seneviratne et al. public. Year missing [Jens Zinke, Germany]	Not applicable - This figure caption was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39720	48	3	48	4	Add "submitted" or the year of publication to "Seneviratne et al." [Hernan Edgardo Sala, Argentina]	Not applicable - This figure caption was rewritten
50906	48	3	48	4	year of publication is missing in reference "Seneviratne et al...." also the sentence does not make sense, may need to be completed [Amjad Masood, Pakistan]	Not applicable - This figure caption was rewritten
10324	48	4	48	17	The references in line of 4 and 17 are not complete here. [Hungary]	Not applicable - This figure caption was rewritten
1794	48	6	48	6	The term 'objective' should be deleted - the identification should be objective as much as possible anyway. It would be useful however to explain here the criteria that we utilized to identify hot spots (e.g. what does it mean 'significant differences' mentioned in the figure's caption? The same coomment applies to Figures 3.11 and 3.13. [Greece]	Rejected. "Objective" appears suitable in this context.
17354	48	6	48	6	Delete "Similarly" [David Schoeman, Australia]	Editorial. Revision could be considered prior to publication, would not change meaning of sentence.
10326	48	11	48	11	Do we mean here SPI2 or as in other parts of the text SPI12? [Hungary]	Accepted – In the revised text SPI12 is used
29438	48	12	48	12	Please rewrite "statistically". [Joan A. Lopez-Bustins, Spain]	Editorial - copyedit to be completed prior to publication
56632	48	13			I might have missed the exact definition of NEB but how do these results compare with studies in the area on droughts in 2014 and 2016 that could not find a significant trend in drought risk neither now nor in the near future?http://www.ametsoc.net/eee/2016/ch13.pdf https://journals.ametsoc.org/doi/pdf/10.1175/BAMS-ExplainingExtremeEvents2014.1 [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - The text has been extended and rephrased. In at least one drought metric drying trends have been identified.
1796	48	15	48	17	This strong increase is not apparent from Figure 3.15 (or at least the very small size of the Figure dows not allow to make such a conclusion). It would be useful to add here the % of increase. [Greece]	Rejected. It is apparent from the figure. Maybe the shading over the ocean is somewhat distracting.
3532	48	15			Replace 'report' by 'reports'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
17356	48	15	48	15	Replace "report" with "reports". [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
40226	48	17	48	17	The year of the reference"Wartenburger et al." was missed. [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
50908	48	17	48	17	year of publication is missing in reference in "Wartenburger et al." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
10328	48	18	48	21	The fact that observations in the MED region have the same signal in drying as the projection results are not "additional evidences supporting" each other. Model signals are not linear in the future as observation trends are also not the same for the last 30 years or over the 20th century. Furthermore, in Table 3.16 not all changes are statistically significant over MED region. Box 3.3 is not about the observed trends in the Mediterranean. It could be rephrased similar to this: This is a region that is also already displaying substantial drying in the observational record (Greve et al., 2014; Gudmundsson et al., 2017; Gudmundsson and Seneviratne, 2016; Seneviratne et al., 2012; Sheffield et al., 2012), suggesting that it might be a hot spot of dryness change above 1.5°C. [Hungary]	Accepted - Text was revised with the suggested edit
53104	48	21	48	21	There are several drought prone regions in Africa (Gan et al., 2016). Sub-Saharan Africa could be another hot spot of dryness under impact of climate change and ENSO (Gizaw and Gan, 2016). Gan TY, Ito M, Hülsmann S, Qin X, Lu XX, Liong SY, Rutschman P, Disse M, Koivusalo H (2015) Possible climate change/variability and human impacts, vulnerability of drought-prone regions, water resource and capacity building for Africa. J of hydrological sciences, 61 No 7:1209–1226. doi:10.1080. [Thian Gan, Canada]	Accepted – Sub-Saharan Africa is assessed in detail in Box 3.1.
16074	48	22	48	32	This graphic is not useful. In particular the three-letter region codes are not defined [Australia]	Rejected. This figure is very important for our assessment. But will add definition of region codes prior to publication.
52622	48	22	48	23	Would suggest revising Figure 3.16 (and other related and similar tables) by having boxes with negative signs (other than those denoted by grey) representing -ve differences, be denoted by a different colour to the red ones (in a colour blind firendly scheme) to make the -ve vs +ve more immediately visible, thus providing bettercontrasts between decreases and increases. [Charlotte Roehm, United States of America]	Accepted – The figure has been revised accordingly
17358	48	25	48	25	Replace "as" with "to". [David Schoeman, Australia]	Not applicable - This figure caption was rewritten
10330	48	26	48	28	These abbreviation explanations are not definitions. They should be included whether CDD means <1 mm; what is SPI. [Hungary]	Noted. Will add more background on definition of indices in Annex prior to publication.
24160	48	27	48	27	in Figure 27's caption, P-E: Precipitation minus Evaporation or Evapotranspiration? And it is actual or potential? [Mustafa Tufan Turp, Turkey]	Accepted - The authors used actual evapotranspiration, which is now mentioned in the text.
24218	48	27	48	27	In here, "Precipitation minus Evaporation" is this potential evaporation or evapotranspiration? And it is actual or potential? [Nazan AN, Turkey]	Accepted - The authors used actual evapotranspiration, which is now mentioned in the text.
21818	48	30			In statistical language the right term is "non-statistically significant" which is different from "insignificant" (avoid the use of this term... it is not correct) [LUIS VALDES, Spain]	Accepted – Text will be corrected prior to publication.
56738	48	32	48	32	Missed a half bracket after (1995)? [Xiaolin Zhang, China]	Not applicable - This figure caption was rewritten
30460	48	35			Here and throughout the chapter: please make sure that you precise which kind of drought you are talking about to avoid confusion (meteorological, agricultural, hydrological) [France]	Noted. Will consider adding a sentence on this in the summary of projections.
49956	48	35	48	36	The tropical country such as Indonesia, pay more attention to drought which often is linked with El Nino. Can the author add some discussions on this issue? As in the context of climate change we discuss changes in drought frequency however how about the impacts of El Nino under changing climate? Based on our review published in a book (ISBN: 978-60-2740-119-8 - available in Bahasa), many articles in Indonesia focussed on climate change, actually discuss El Nino when doing research on drought analysis. So a highlight box that discuss the impacts of El Nino and climate change on drought may help readers. [Perdinan Perdinan, Indonesia]	Noted. Cannot be added because of space constraints.
279	48	36	48	36	.....probability of extreme changes..... [Paul Doyle, Canada]	Accepted - Text was revised with the suggested edit
6504	48	36	48	36	extremes' should be 'extreme' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7890	48	36	48	43	Studies indicating the benefits of stabilising climate warming to 1.5°C for North africa should use bias corrected outputs and the bias correction sould use a reference period which include the last decade which was very important in term of precipitation and temperature variability. (Occurrence of Extreme events: floods, heat waves,…) and the quality of data, (increasing number of weather stations network). [khadija kabidi, Morocco]	Not applicable – This is speculative and not supported by references
16076	48	36	48	37	Please give numbers and show there is a significant difference between the 1.5 and 2C warming scenarios [Australia]	Accepted. Could provide more detailed assessment based on underlying publication.
17360	48	36	48	36	Replace "extremes" with "extreme". [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
18294	48	36	48	43	The main body of the chapter points several time to the larger uncertainty associated with drought and dryness projections. This is however not referred to in the summary, which may lead to an over-confidence in the results reported in the summary. [Andrea TILCHE, Belgium]	Accepted - Will add a sentence on this point prior to publication, in particular highlighting the large range of projections
56294	48	36	48	36	Change "extremes" to "extreme". [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
57568	48	36	48	36	Should say “extreme” (delete s) [Hans Poertner, Germany]	Accepted - Text was revised with the suggested edit
6506	48	37	48	37	vailability' should be 'availability' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9192	48	37			Please change "vailability" to "availability" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10014	48	37	48	43	The paragraph should correctly note that at the global level, shifting from 2.0c to 1.5c has no statistically discernable impact on dryness or water availability, yet there are effects detected for some regions such as Mediterranean , North Brazil, and South Africa. [Saudi Arabia]	Rejected. Global changes are not meaningful. It is regional changes that matter.
21820	48	37			Replace "warervailability" by "water availability" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
62300	48	37	48	37	vailability' -> 'availability' [Go Eun Park, Republic of Korea]	Accepted - Text was revised with the suggested edit
9194	48	38			Please change "inceases" to "increases" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
50910	48	39	48	39	Northen Africa instead of "northern Africa" [Amjad Masood, Pakistan]	Editorial - copyedit to be completed prior to publication
10332	48	41	48	43	The part "model experiments" should be omitted as past trend was recognized by observations only. [Hungary]	Not applicable – Reanalysis data as well as offline hydrological simulations are based on modelling experiments
1392	49		50		It is unclear why the box jumps to the impacts when it is apparently about climate science. Personally, I find it better to focus on the impacts but much of the text is at the limit of speculation (eg missing the war in Syria). My recommendation would be to drop this box entirely. [Karen Olsen, Denmark]	I hope to have been clearer on the objectives
6208	49		50		It is unclear why the box jumps to the impacts when it is apparently about climate science. Personally, I find it better to focus on the impacts but much of the text is at the limit of speculation (eg missing the war in Syria). My recommendation would be to drop this box entirely. [Anne Olhoff, Denmark]	I hope to have been clearer on the objectives
39934	49		49		I suggest to revise the paragraph No. 3 in box 3.3 concerning the harsh drought condition in Middleast countries; Iran and Iraq based on the various research works; i.e., Cook, B. I., K. J. Anchukaitis, R. Touchan, D. M. Meko, and E. R. Cook (2016), Spatiotemporal drought variability in the Mediterranean over the last 900 years, J. Geophys. Res. Atmos., 121, 2060–2074, doi:10.1002/2015JD023929; DOI10.4236/oje.2017.72012; Hosseinzadeh Talaee, P., Tabari, H. and Sobhan Ardakani, S. (2014), Hydrological drought in the west of Iran and possible association with large-scale atmospheric circulation patterns. Hydrol. Process., 28: 764–773. doi:10.1002/hyp.9586; DOI10.2166/wcc.2014.076 [Hamidreza Solaymani Osbooei, Iran]	In the shortening work, we have tried to focus on a clear objective which is adaptation capacities of these societies on the long term
39936	49		49		It needs to add one more paragraph concerning the highly drought conditions in Iran from 2007 to 2016. Various Iranina basins such Karkheh and Zayandehrud basins was impacted climate change. It can be reffer to: Ashraf Vaghefi, S., Mousavi, S. J., Abbaspour, K. C., Srinivasan, R. and Yang, H. (2014), Analyses of the impact of climate change on water resources components, drought and wheat yield in semiarid regions: Karkheh River Basin in Iran. Hydrol. Process., 28: 2018–2032. doi:10.1002/hyp.9747; DOI10.4236/oje.2017.72012 and Babaei, H., Araghinejad, S. and Hoorfar, A. (2013), Developing a new method for spatial assessment of drought vulnerability (case study: Zayandeh-Rood river basin in Iran). Water Environ J, 27: 50–57. doi:10.1111/j.1747-6593.2012.00326.x and DOI: 10.2166/wcc.2017.107 [Hamidreza Solaymani Osbooei, Iran]	With the necessity to reduce by 50%, it is impossible to be exhaustive; the example of Syria has the advantage to show interconnections with war, migrations, etc…; but Iran is mentioned
48282	49		49		It needs to add one more paragraph concerning the highly drought conditions in Iran from 2007 to 2016. Various Iranina basins such Karkheh and Zayandehrud basins was impacted climate change. It can be reffer to: Ashraf Vaghefi, S., Mousavi, S. J., Abbaspour, K. C., Srinivasan, R. and Yang, H. (2014), Analyses of the impact of climate change on water resources components, drought and wheat yield in semiarid regions: Karkheh River Basin in Iran. Hydrol. Process., 28: 2018–2032. doi:10.1002/hyp.9747; DOI10.4236/oje.2017.72012 and Babaei, H., Araghinejad, S. and Hoorfar, A. (2013), Developing a new method for spatial assessment of drought vulnerability (case study: Zayandeh-Rood river basin in Iran). Water Environ J, 27: 50–57. doi:10.1111/j.1747-6593.2012.00326.x and DOI: 10.2166/wcc.2017.107 [Iran]	With the necessity to reduce by 50%, it is impossible to be exhaustive; the example of Syria has the advantage to show interconnections with war, migrations, etc…; but Iran is mentioned
16078	49	1	50	34	It's not clear why the Mediterranean gets its own "box" and not other regions [Australia]	Because this region anticipate multiple stressors more or less interconnected; adaptation by migration is one of them
39722	49	1	49	1	Remove "[START BOX 3.3 HERE]", [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
47258	49	1	50	36	Comment submitted by Afra Hamid (afra_hamid@yahoo.com) via the TSU: Add desertification hazard [Sarah Connors, France]	see reply to comment 16078
49442	49	1	49	49	Consider to include into this box the influence of SST warming in Mediterranean Sea on severe convective event formation (e.g. see: Meredith et al., 2015, doi: 10.1038/ngeo2483; Volosciuk et al., 2016, doi: 10.1038/srep32450; Miglietta et al., 2017, doi: 10.1038/s41598-017-13170-0). The following literature can be also used in the 3.5.5.5. subsection. (or, maybe this information can be used only in the 3.5.5.5. subsection) [Alexander Chernokulsky, Russian Federation]	it is not the objective of this box to focus on physical properties, but rather on interaction between physics and social processes
50994	49	1	50	34	It is important to focus the Box 3.3 on drought and drought related aspects mainly [Fatima Driouech, Morocco]	it is not the objective
41478	49	1	50	34	Here they focus only on "Meditaranean Basin and Middle East" droughts. However, my understanding is that we have also severe drought, for example in California now. We have already experienced heavy drough which caused severe forest fire damage in that area. Sato et al (2015) has already pointed out that those area has passed the point of no return for TPCD?Timing of Perception Change for Drought (Sato, Yoshimura, Kim, Oki,2015: Study on impact of the water resources management on projected future change og drought, Journal of JSCE, Series B, 71, I.391-I.396 (In Japanese)). [Izuru Takayabu, Japan]	Mediterranean region is seen as an example of vulnerable region (but not the only one); the objective is not to be exhaustive but to show an example where complex factors interplay with an important adaptative role of migrations
17370	49	3	50	34	This whole box is reasonably poorly written. Sentence structure is confusing, thre are spelling errors, and punctuation is poor. It needs careful attention. [David Schoeman, Australia]	Accepted - text has been revised
31478	49	3	49	49	In the Box 3.3, could you tell us why only around Mediterranean is shown. We have already experienced a heavy drought in 2017, which caused many forest fires in the western coast of the United States. It is already said that, in this area, it appears that the drought was caused by the climate change (Satoh et al., 2015). This area should be focused as well. [Japan]	Mediterranean region is seen as an example of vulnerable region (but not the only one); the objective is not to be exhaustive but to show an example where complex factors interplay with an important adaptative role of migrations
61860	49	3	50	34	I see the box as an opportunity to highlight the various risks for the Mediterranean - Middle East region, building on other parts of the chapter (heat waves, heavy rainfall events, drought) for it to be broader than the focus on one drought. Please re-think the content of the box, so that it is consistent with the rest of the chapter, then provide the historical background, one example (Levant drought 2007-2010) in context (exceptional over centuries; lack of precipitation exacerbated due to warming). Is the PDSI the most suitable index to use, compared to the metrics used in the other parts of the chapter? Then provide the discussion of climate versus other elements of social unrest. Then projections. [Valérie Masson-Delmotte, France]	The objective of the box is to illustrate a vulnerable region (Mediterranean) with a long history of droughts but also with a long history of adaptations including population changes. These droughts are now more intense as the precipitation deficit is amplified by high temperatures. In the future, temperature increase will play a much important role than in the past. The box has been much rewritten and shortened.
17362	49	6	49	6	How does "with global ramifications" fit with the rest of the sentence. Either clarify, or delete. [David Schoeman, Australia]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39724	49	13	49	13	Four commas are missing along the citations included in this line. [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
7800	49	14			same as 6 [Anthony Lupo, United States of America]	unclear what this comment refers to
21822	49	14			add "year" in citation or delete the reference (two cases in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39726	49	14	49	14	The years of publications are missing in "Jacob et al.; Pfeifer et al." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
62378	49	14	49	14	Please verify these references "Jacob et al.; Pfeifer et al.)"; the year is missing for both [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
39932	49	22	49	22	Please add water, between tourism and agiculture [Hamidreza Solaymani Osbooei, Iran]	Not applicable - This section was rewritten
48278	49	22	49	22	Please add water, between tourism and agiculture [Iran]	Not applicable - This section was rewritten
39956	49	22	49	22	I suggest to revise the paragraph No. 3 in box 3.3 concerning the harsh drought condition in Middleast countries; Iran and Iraq based on the various research works; i.e., Cook, B. I., K. J. Anchukaitis, R. Touchan, D. M. Meko, and E. R. Cook (2016), Spatiotemporal drought variability in the Mediterranean over the last 900 years, J. Geophys. Res. Atmos., 121, 2060–2074, doi:10.1002/2015JD023929; DOI10.4236/oje.2017.72012; Hosseinzadeh Talaee, P., Tabari, H. and Sobhan Ardakani, S. (2014), Hydrological drought in the west of Iran and possible association with large-scale atmospheric circulation patterns. Hydrol. Process., 28: 764–773. doi:10.1002/hyp.9586; DOI10.2166/wcc.2014.076 [Hamidreza Solaymani Osbooei, Iran]	In the shortening work, we have tried to focus on a clear objective which is adaptation capacities of these societies on the long term
48280	49	22	49	22	I suggest to revise the paragraph No. 3 in box 3.3 concerning the harsh drought condition in Middleast countries; Iran and Iraq based on the various research works; i.e., Cook, B. I., K. J. Anchukaitis, R. Touchan, D. M. Meko, and E. R. Cook (2016), Spatiotemporal drought variability in the Mediterranean over the last 900 years, J. Geophys. Res. Atmos., 121, 2060–2074, doi:10.1002/2015JD023929; DOI10.4236/oje.2017.72012; Hosseinzadeh Talaee, P., Tabari, H. and Sobhan Ardakani, S. (2014), Hydrological drought in the west of Iran and possible association with large-scale atmospheric circulation patterns. Hydrol. Process., 28: 764–773. doi:10.1002/hyp.9586; DOI10.2166/wcc.2014.076 [Iran]	In the shortening work, we have tried to focus on a clear objective which is adaptation capacities of these societies on the long term
6508	49	25	49	25	yieldsare' should be 'yields are' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9196	49	25			Please change "yieldsare" to "yields are" [Marco Turco, Spain]	Not applicable - This section was rewritten
10686	49	25	49	25	Change to '...agricultural yields are strongly dependent on irrigation..' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
44948	49	25	49	25	yieldsare-->yields are [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
50912	49	25	49	25	agricultural yields are instead of "agricultural yieldsare.." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
17364	49	26	49	26	What is a "yield-gap closure"? [David Schoeman, Australia]	Not applicable - This section was rewritten
17366	49	27	49	27	By when? [David Schoeman, Australia]	Not applicable - This section was rewritten
50996	49	27	51	27	most or more or the most? Please correct [Fatima Driouech, Morocco]	Not applicable - This section was rewritten
28280	49	33	49	33	Please revise: catchments instead of drainage basins. [Germany]	done
54822	49	36	49	37	The most important impact of the climate change on water resources in Iran is undoubtedly the drying of Lake Urmia (AghaKouchak et al., 2015). [Alireza Movaghari, Iran]	yes but it is not the topic of the box
7546	49	37	49	37	...(Yazdanpanah et al., 2016b) and the crop… space after brackets [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
9198	49	37			Please change "37 (Yazdanpanah et al., 2016b)and" to "37 (Yazdanpanah et al., 2016b) and" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
21824	49	37			insert space between "2016b)and" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
24220	49	37	49	37	2016b)and" it is adjacent [Nazan AN, Turkey]	Accepted - Text was revised with the suggested edit
39946	49	37	49	37	Add a blank space between "2016b)" and "and" [JOFRE CARNICER, Spain]	done
50914	49	37	49	37	2016b) and instead of "2016b)and" [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
57036	49	37	49	37	missing space "al., 2016b)and" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
62380	49	37	49	37	Instead of writing "(Yazdanpanah et al., 2016b)and the crop performance in Iran (Saeidi et al., 2017).", please write "(Yazdanpanah et al., 2016b) and the crop performance in Iran (Saeidi et al., 2017)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
3534	49	39	49	46	All these sentences are not really related to climate. Consider removing. [David Docquier, Belgium]	this is to show the complexity of the system
18296	49	39	50	13	While impacts of climate change may compound existing challenges, the reference to the Syrian war - and the level of detail dedicated to it - does not seem warranted. [Andrea TILCHE, Belgium]	this has been much attenuated
9200	49	40			Please change "Kelley et al., 2015).While" to "Kelley et al., 2015). While" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
280	49	45	49	45	....groundwater resources (SPACE) increasing..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
6510	49	45	49	45	resourcesincreasing' should be 'resources increasing' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7548	49	45	49	45	...groundwater resources increasing Syria's vulnerability… space after resources [Jens Zinke, Germany]	Not applicable - This section was rewritten
10688	49	45	49	45	Change to '...groundwater resources increasing Syria's vulnerability in 2006–2007…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21826	49	45			insert space between "resourcesincreasing" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
29440	49	45	49	45	A space is missing between "resources" and "increasing". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
39948	49	45	49	45	Separate these two words: "resources"/"increasing" [JOFRE CARNICER, Spain]	done
44950	49	45	49	45	resourcesincreasing-->resources increasing [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
50916	49	45	49	45	...resources increasing... instead of "...resourcesincreasing..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
57038	49	45	49	45	missing space "groundwater resourcesincreasing" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
17368	49	46	49	46	The climate hypothesis has not been clearly stated. Consider revising. [David Schoeman, Australia]	Accepted - Text was revised
281	49	47	49	47	.....played an (SPACE) important..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
6512	49	47	49	47	animportant' should be 'an important' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7550	49	47	49	47	...have played an important… space after an [Jens Zinke, Germany]	Not applicable - This section was rewritten
10690	49	47	49	47	Change to '...drought may have played an important…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21828	49	47			insert space between "animportant" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
28282	49	47	49	48	This seems highly speculative. Thus, the sentence should please be changed to "might have played a role" or substantiated by scientific evidence. Please apply the agreed IPCC uncertainty language. [Germany]	done
29442	49	47	49	47	A space is missing between "an" and "important". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
35312	49	47	49	47	an important [Ana Bastos, France]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39950	49	47	49	47	Delete "animportant" and substitute for "an important" [JOFRE CARNICER, Spain]	done
44952	49	47	49	47	animportant-->an important [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
50918	49	47	49	47	...played an important instead of "...played animportant" [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
57040	49	47	49	47	missing space "animportant" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
62382	49	47	49	47	Instead of writing "drought may have played animportant", please write "drought may have played an important" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6514	49	49	49	49	trigged' should be 'triggered' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
29444	49	49	49	49	Please rewrite "triggered". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
7312	50		51		General comment on this section - this section just seems to list all the studies without trying to summarise general conclusions based on agreement between studies (and perhaps pointing out disagreeing studies). Instead the general conclusions seem to come from a random choice of 1 study or the reader is left to form their own overall opinion which is not consistent with general IPCC writing. It's also unclear whether or not robust conclusions (i.e. tested for some kind of statistical significance) have been taken from each study or if all projected changes are referred to. For example, it woudl be easier for the reader if the impact were stated: e.g. Low runoff has been projected to increase in mountainous parts of Europe with high agreement between studies (Donnelly et al. 2017, Marx et al. 2018, etc.). Changes to mean and low runoff in the Mediterrean are projected to decrease although there is low to medium agreement between studies (e.g. Marx et al. 2018, Schleussner et al. 2016, but Donnelly et al. 2017 indicating non-robust changes). [Chantal Donnelly, Australia]	The point of view is a little different and the box has been rewritten and shortened with clear conclusion: the risk is important at 1.5°C and will increase with higher temperatures.
56296	50	3	50	3	Change "displacement" to "displacements". [Annika Herbert, Australia]	Not applicable - This section was rewritten
282	50	5	50	5	....Syria (SPACE) can..... I am stopping edit of 2 words running together at this point. Obviously very numerous malfuction. Others need to correct all these typos throughout chapter. This particulr typo seems to be increasing as I glance ahead through chapter. It is as if the space bar was sticking more and more. [Paul Doyle, Canada]	Editorial - copyedit to be completed prior to publication
3536	50	5			Separate 'Syria' and 'can'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3538	50	5	50	22	I would not include these two paragraphs as they relate to past climate, which is not the focus of this report, and are not so well connected to the rest of this box. [David Docquier, Belgium]	I hope that the new version clarifies the interest of the past to understand the present/future
6516	50	5	50	5	Syriacan' should be 'Syria can' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7552	50	5	50	5	...The example of Syria can… space after Syria [Jens Zinke, Germany]	Not applicable - This section was rewritten
10692	50	5	50	5	Change to 'The example of Syria can be seen as part of a long history of …' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
29446	50	5	50	5	A space is missing between "Syria" and "can". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
29450	50	5	50	13	I would delete all this paragraph except for the first sentence "The example of Syria can... ...in the Middle East". I would add this sentence to the former paragraph after "(Kelley et al., 2017)". [Joan A. Lopez-Bustins, Spain]	this part has been cut
35314	50	5	50	5	Syria can [Ana Bastos, France]	Not applicable - This section was rewritten
43268	50	5	50	13	A litte long - could be reduced by removing the sentence beginning with " The rural settlements.." [Edward Byers, Austria]	much shortened
46344	50	5	50	5	This sentence should be rephrased. "part of a long history" gives the impression that the commonalities are confirmed between the Syrian case and pas civilization breakdowns whereas the issue is highly debated. [Etienne Piguet, Switzerland]	this part has been cut
50920	50	5	50	5	...Syria can.. instead of "...Syriacan..." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
58440	50	6	50	11	Six papers are cited for the six scenarios shown in the graph. But source (IEA/IRENA) 2017 is not there. Please fix this, dropping the citation that is not needed. [Andrew Prag, France]	there is no graph
7554	50	7	50	7	...Bronze Age, approximately… spece after comma [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
21830	50	7			insert space between "Age,approx" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
39952	50	7	50	7	Introduce a blank space after "Bronze Age," [JOFRE CARNICER, Spain]	Editorial - copyedit to be completed prior to publication
50922	50	7	50	7	..Bronze Age, approximately instead of "..Bronze Age,approximately" [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
56298	50	8	50	8	Change "of Eastern" to "of the Eastern" or "in the Eastern". [Annika Herbert, Australia]	Not applicable - This section was rewritten
6518	50	9	50	9	settlements that afterwards' should be 'settlements afterwards' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
30462	50	9	50	10	The sentence is not complete [France]	Not applicable - This section was rewritten
39954	50	9	50	10	Rewrite/revise this sentence: "The rural settlements that afterwards re-emerged with agro-pastoral activities and limited long-distance trade". Suggestion: change to "The rural settlements that afterwards re-emerged were characterised by agro-pastoral activities and limited long-distance trade (Kaniewski et al. 2015)". [JOFRE CARNICER, Spain]	done
56300	50	9	50	9	Change "The rural…" to "Rural…" And remove "that". [Annika Herbert, Australia]	Not applicable - This section was rewritten
6520	50	12	50	12	hastenthe fall' should be 'hasten the fall' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7556	50	12	50	12	...hasten the fall… [Jens Zinke, Germany]	Not applicable - This section was rewritten
10694	50	12	50	12	Change to 'hasten the fall of a civilization by…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21832	50	12			insert space between "hastenthe" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
29448	50	12	50	12	A space is missing between "hasten" and "the". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
44954	50	12	50	12	hastenthe-->hasten the [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
56302	50	12	50	12	Remove "the", so that it reads: "leading to political…." [Annika Herbert, Australia]	Not applicable - This section was rewritten
12032	50	15	50	15	Implies 21st century is not in Holocene and that we are in the Anthropocene - still hotly debated and not necessarily useful concept here. Can this be rephrased to just compare current droughts with droughts in the past? The Holocene has not been mentioned much previously either so I think this will be quite confusing for a non-expert reader. [United Kingdom (of Great Britain and Northern Ireland)]	it is clearly indicated that we are at the climatic level

Comment No	From Page	From Line	To Page	To Line	Comment	Response
28284	50	21	50	22	Please add the following words to this sentence (shown below in CAPITAL) to make it relevant for all three Rio Conventions: "… are of high risk for the Mediterranean natural and managed ecosystems, FOR SAFEGUARDING BIODIVERSITY, AND FOR DEVELOPING MEASURES TO AVOID, REDUCE AND REVERSE LAND DEGRADATION AND DESERTIFICATION." You may also wish to refer to the IPCC SRCCL; The IPBES thematic assessment on "Land Degradation and Restoration" (to be finalised at/approved by the sixth session of the IPBES in March 2018: https://www.ipbes.net/deliverables/3bi-land-degradation) and Orr, B.J., A.L. Cowie, V.M. Castillo Sanchez, P. Chasek, N.D. Crossman, A. Erlewein, G. Louwagie, M. Maron, G.I. Metternicht, S. Minellin, A.E. Tengberg, S. Walter, and S. Welton. 2017. Scientific Conceptual Framework for Land Degradation Neutrality. A Report of the Science-Policy Interface. United Nations Convention to Combat Desertification (UNCCD), Bonn, Germany. Available at: http://www2.unccd.int/sites/default/files/documents/2017-08/LDN_CF_report_web-english.pdf [Germany]	with the new version, this is not necessary anymore
56304	50	22	50	22	Change to "Mediterranean's". [Annika Herbert, Australia]	Not applicable - This section was rewritten
3540	50	24			Remove 'of' before 'the 2008'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
6522	50	24	50	24	comparing of the' should be 'comparing the' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
18298	50	24	50	34	Extrapolating evolution of drought under 1.5 and 2 from past observation without recognising the pitfall of the approach may lead to an overconfidence on the results. [Andrea TILCHE, Belgium]	now the comparison between two states from the past has been made more robust by using model projections
56306	50	24	50	24	Remove "of", so that it reads: "comparing the 2008…" [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit
12034	50	26	50	26	Is this acronym definition needed? It's not used again, detracts from readability of paragraph. [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
5596	50	28	50	28	the median…not …themedian [Sandra CASSOTTA, Denmark]	Accepted - Text was revised with the suggested edit …themedian… occurred on page 51 line 28:
283	50	33	50	33	.....already affected food ..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
6524	50	33	50	33	already affectted food' should be 'already affected food' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
50924	50	33	50	33	..affected.. instead of "..affectted.." [Amjad Masood, Pakistan]	Not applicable - This section was rewritten
39728	50	36	50	36	Remove "[END BOX 3.3 HERE]". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
7870	50	39	52	38	Section 3.3.5 "Runoffs and river floodiig" contains information about the runoffs under the 1.5C and 2.0C scenarios for several rivers. These rivers, however, are listed in order that looks almost random, and many big rivers and even entire regions of the world are missing. For example, of the great Siberian rivers, only the Lena is mentioned. Is it possible to provide a more complete and systematic assessment of the projected runoffs? [Petr Zavialov, Russian Federation]	Taken into account - Text revised. New literature added.
10016	50	39	57	45	Summary statements appended to each subsection 3.3.5 to 3.3.10 similar to that appended to 3.3.4 indicating that impacts of 1.5c vs 2c on run-off, snow, cyclones, ocean circulation, and sea ice are either not discernable or there are literature gaps that make it difficult to draw conclusions on these effects. [Saudi Arabia]	Taken into account - Text revised. Summary statements were added.
17372	50	39	52	38	Particularly poor editorial standards in this Section. It needs a lot of attention. [David Schoeman, Australia]	Thank you
29452	50	39	52	38	Writing needs improving. Overall section 3.3.5 is poorly presented. Many typing mistakes are detected and they make difficult the overall reading. The content is also difficult to follow; for instance, in L33P51 what does "1.5ºC reduces the extent and severity of runoff" mean in this sentence? The organization of the writing about world major catchments needs also improving. Section 3.3.9 is a good example to follow where all results and discussion are clearly presented. [Joan A. Lopez-Bustins, Spain]	Accepted - The section was rewritten
30464	50	39			3.3.5 Runoff and river flooding It would be relevant to include here a section about hydrological drought if possible. [France]	Taken into account - Text revised
11996	50	41	52	28	The previous sections (3.3.2, 3.3.3, 3.3.4) were divided into subsections of "observed and attributed changes" and "projected differences between 1.5 and 2 degrees"), which improved clarity. This, and subsesquent sections, could benefit from a similar structure. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text revised. The text was divided in two subsections
7294	50	44	50	44	because more winter precipitation falls as rain instead of snow Please add: and because snowmelt occurs earlier or more often during the Winter season. [Chantal Donnelly, Australia]	Not Applicable - paragraph wit AR5 results no longer included in the section
9614	50	45	50	45	There's an important missing puzzle piece here - after "decrease in snow storage exacerbating summer dryness (Jimenez Cisneros et al., 2014a)" insert "exacerbated in many regions by loss of mountain glaciers and associated runoff (O'Neel et al., 2015)." The literature citation is O'Neel et al., 2015, Icefield-to-ocean linkages across the Northern Pacific Coastal Temperate Rainforest Ecosystem, Bioscience, 65,499-512. [Sean Fleming, United States of America]	Not Applicable - paragraph wit AR5 results no longer included in the section
52624	50	45	50	49	Refer to Najibi and Devineni (2017) for additional information regarding recent trends in the frequency and duretion of global floods. Najibi and Devineni Earth Syst. Dynam. Discuss., https://doi.org/10.5194/esd-2017-59 Manuscript under review for journal Earth Syst. Dynam. [Charlotte Roehm, United States of America]	Rejected - under review manuscripts cannot be cited
21834	51	1		48	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
32472	51	1	51	1	Does land-use/land-cover here include or imply urbanization? If so, please add "including urbanization". If not, please add "not considering urbanization" [Rosanne Martyr-Koller, Germany]	Taken into account - The section refers to changes at basin scale, not urban scale
39970	51	1	51	48	This paragraph needs intense technical editing. Missing spaces and comma are frequently found in the text [Adi Nugraha, United States of America]	Thank you
44956	51	1	52	38	There are so many connected words. [Hiroaki Kondo, Japan]	Accepted - Text was revised to correct the connected words
49880	51	1	51	10	Another paper to assess that also looks into river regulation of snow-fed rivers (https://www.nature.com/articles/s41467-017-00092-8) [Erik Kjellström, Sweden]	Taken into account - reference added
10696	51	4	51	4	Change to 'agricultural practices as water withdrawal for irrigation,…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
29454	51	4	51	4	A space is missing between "withdrawal" and "for". [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised with the suggested edit
35072	51	4	51	4	There should be spacing between "withdrawalfor" . The correct expression is with drawal for. [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
44366	51	4	51	8	Space is missing in 5 places [Rita Man Sze Yu, China]	Thank you - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
57042	51	4	51	4	missing space "withdrawalfor" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
3542	51	7			Separate 'increases' and 'in'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
6526	51	7	51	7	increasesin global' should be 'increases in global' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7296	51	7	51	7	missing space between 'increases' and 'in' and between 'l'and-use' and '(predominantly)' [Chantal Donnelly, Australia]	Accepted - Text was revised with the suggested edit
7558	51	7	51	8	...land-use (predominantly deforestation) are… insert spaces [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
10698	51	7	51	7	Change to 'that increases in global runoff…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
34676	51	7			missing a space before and after the corresponding parentheses "land-use(predominantly desforestation)are" [Mexico]	Accepted - Text was revised with the suggested edit
39730	51	7	51	7	Insert space in "increasesin", and before the opening parenthesis in "land-use(predominantly". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
40228	51	7	51	7	separate between "increase" and "in" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
56770	51	7	51	7	increasing instead of "increasesin"? [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
57044	51	7	51	8	continous missing space in 4 words [AMANDINE PASTOR, France]	Thank you - Text was revised with the suggested edit
3544	51	8			Separate 'counterbalanced' and 'by'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
6528	51	8	51	8	counterbalancedby' should be 'counterbalanced by' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7298	51	8	51	8	missing space between 'deforestation)' and 'are' [Chantal Donnelly, Australia]	Accepted - Text was revised with the suggested edit
10700	51	8	51	8	Change to 'are counterbalanced by decreases from irrigation…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35074	51	8	51	8	There should be spacing between "counterbalancedby" . The correct expression is with counter balanced by. [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
39732	51	8	51	8	Insert space after the closing parenthesis in "deforestation)are". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
56774	51	8	51	8	Missed a space before "...by decreases.." [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
16080	51	12	51	42	Detailed projections of runoff and water availability are available for Australia. See Figure 25-4 in IPCC AR5 WG2 and [Chiew F and Prosser I (2011) http://www.publish.csiro.au/ebook/chapter/9780643103283_Chapter_3] (Chiew et al. (2017) http://www.mssanz.org.au/modsim2017/L16/chiew.pdf]. For 1.5oC warming, the median projection shows 7% decline in runoff in south-east Australia (where the majority of population lives and food production occurs). The percent change in rainfall is amplified as a 2-3 times bigger percent change in runoff [Chiew FHS (2006) Estimation of rainfall elasticity of streamflow in Australia. Hydrological Sciences Journal, 51, 613-625.] The projected decline in future freshwater resources in south-eastern and far south-west Australia is due to the reduction in winter precipitation when most of the runoff in the region occurs. The decline in winter rainfall is evident in the observations and this has been partly attributed to anthropogenic global warming [Chiew et al. (2013) Observed hydrologic nonstationarity in far south-eastern Australia: implications and future modelling predictions. Stochastic Environmental Research and Risk Assessment, 28, 3-15.] Rainfall has also decreased substantially in Southwestern and Southern Australia see Pertrone et al. 2010 doi:10.1029/2010GL043102 and Delworth and Zeng 2014 doi:10.1038/ngeo2201. The text should say TOTAL precipitation and runoff values have increased.....". [Australia]	Taken into account - Text revised. Only relevant literature on 1.5C & 2C was included in this section
62384	51	12	51	25	This paragraph is really good! [JACQUES-ANDRE NDIONE, Senegal]	Noted
284	51	14	51	14	.....for 27.5 % of 200 of the world's..... [Paul Doyle, Canada]	unclear what this comment refers to - Text was revised with space after 27.5%.
7300	51	14	51	14	missing space between '27.5%' and 'of' (And many more places throughout this section on runoff - suggest editing for spaces) [Chantal Donnelly, Australia]	Accepted - Text was revised with the suggested edit
7560	51	14	51	14	...for 27.5% of the 200… space after 27.5% [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
24206	51	14	51	14	for 27.5%of" of is adjacent [Nazan AN, Turkey]	Accepted - Text was revised with the suggested edit
39734	51	14	51	14	Insert space after the "%" in: "27.5%of". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
44368	51	14	51	14	Space is missing "for 27.5%of the" [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
56308	51	14	51	14	Rephrase. [Annika Herbert, Australia]	Taken into account - text revised
56776	51	14	51	14	Missed a space after "27.5%..." [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
21836	51	15			In statistical language the right term is "non-statistically significant" which is different from "insignificant" (avoid the use of this term... it is not correct) [LUIS VALDES, Spain]	Taken into account - Text revised
7304	51	18	51	19	Also southwestern Australia (significant observed decreases in precip and runoff such inflows to Perth dams are now negligible). I don't have a citation for this but hope one of the Australian reviewers points this out. [Chantal Donnelly, Australia]	Taken into account - No additional literature is available to support suggested changes
7302	51	20	51	20	could has' should be 'could have'\ [Chantal Donnelly, Australia]	Accepted - Text was revised with the suggested edit
32474	51	20	51	20	change "could has" to either "could have" or "has" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit "could have"
39736	51	20	51	20	Insert space after the point in: "...2016).A large...". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
41718	51	20	51	20	singular: could have resulted [Stephan Thober, Germany]	Accepted - Text was revised with the suggested edit "could have"
44370	51	20	51	20	Space is missing "2016).A large" [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
57046	51	20	51	20	missing space "2016).A large" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
7802	51	21			Should be Pacific Decadal Oscillation - I've not seen PDV in the literature [Anthony Lupo, United States of America]	Rejected - See i.e. Liu, Z. & Di Lorenzo, E. Curr Clim Change Rep (2018) 4: 128. https://doi.org/10.1007/s40641-018-0090-5
46682	51	22	51	22	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - text revised and changed to alternative wording
7308	51	27	51	28	Disagree that this statement should be made given it references 1 global study using global hydrological models (GHMs). GHMs were seen to often give a different climate change signal than regional HMs (e.g. Hatterman et al. 2017, DOI:10.1007/s10584-016-1829-4,even though this article plays down these changes in the abstract, also Krysanova et al. accepted with revisions, who conclude that regional HMs might be more robust). Marx et al. 2018 results for Europe are also from GHMs. In our European study (using an ensemble including 2 regionally calibrated HMs for Europe together with gHMs), we had a low signal to noise ratio meaning we found changes to runoff mostly insignificant at 1.5 C in most of Mediterranean Europe. Only very localised robust changes between 1.5 and 2 C were seen (Donnelly et al. 2017) for mean runoff, low and high runoff. [Chantal Donnelly, Australia]	Taken into account - Text revised
11992	51	27	51	42	Lots of missing spaces in this paragraph. [United Kingdom (of Great Britain and Northern Ireland)]	Thank you - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
12036	51	27	51	32	This is phrased very confusingly - does this mean that there are reductions in streamflow in the Mediterranean, the high Northern latitudes (e.g. Russia/NOrthern Europe..?), AND India, E Africa and Sahel? Because India/E Africa/Sahel are not high latitude regions. Or is there an *increase* in streamflow in these latter regions? Please rephrase to make clear (apologies if this changes the meaning of the sentences) e.g. "Differences in projected runoff between 1.5°C and 2°C are most prominent in the Mediterranean. Here, the median reduction in annual runoff is 9% at 1.5°C (likely range 4.5-15.5%), while at 2°C warming, runoff decreases by 17% (likely range 8-25%). Similarly there are projected reductions in runoff in much of the high northern latitudes, India, East Africa and the Sahel. Similar results..." [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text revised. The subsection was rewritten.
28286	51	27	51	42	Please consider to give more room to the discussion of IMPACT of run-off change (e.g. water availability), as opposed to changes in run-off (also other parts of the subsection). [Germany]	Taken into account - Covered in Section 3.4.2
16082	51	27	51	38	Rewrite to reflect the conditional nature of the statements here. "There are also likely to be projected increases in much of the high northern latitudes in parts of India, East Africa and parts of the Sahel (Schleussner et al., 2016e). Similar results are found by Doell et al. with likely decreases of 10–30% in the mean annual streamflow around the Mediterranean region that would become significant with an increase in global warming from 1.5°C to 2°C. Donnelly et al. (2017) also found that constraining global warming to 1.5°C would reduce the extent and severity of runoff in southern Europe. Substantial increases in runoff would affect the Scandinavian mountains and are associated with likely decreases in mean annual runoff in Portugal at 1.5°C warming (Donnelly et al., 2017a). Marx et al. (2017) analyzed how hydrological low flows in Europe would be affected under different future global warming levels, finding that low flows would decrease in the Mediterranean with projected decreases in annual precipitation while they would increase in the Alpine and Northern regions because of likely increased snow melt contribution under global warming of 1.5?C.Under this scenario, the mountainous regions in Europe would show the strongest low flow. " [Australia]	Taken into account - Text revised
35906	51	27	51	42	Projected increase in runoff in India has lots of uncertainty due to changes in the monsoon system under the projected future warming. Therefore, this section needs to be modified based on the observations and projections as well as associated uncertainty. [India]	Taken into account - Text revised
41338	51	27	52	14	It is suggested that the findings be presented in table form. It is more of a review that an assessment [Lourdes Tibig, Philippines]	Taken into account - Text revised. The section was rewritten
285	51	28	51	28	.....almost doubles from..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
3546	51	28			Separate 'the' and 'median'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
3548	51	28			Replace 'double' by 'doubles'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6530	51	28	51	28	themedian' should be 'the median' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
6532	51	28	51	28	almost double from' should be 'almost doubled from' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7306	51	28	51	28	missing space between 'the' and 'median', also double should be doubles [Chantal Donnelly, Australia]	Not applicable - This section was rewritten
7562	51	28	51	28	...the median.." space after the [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
10702	51	28	51	28	Change to 'the median reduction in annual runoff almost…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35076	51	28	51	28	There should be spacing between "themedian" . The correct expression is" the median". [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
39738	51	28	51	28	Insert space before the "m" in "themedian". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
41720	51	28	51	28	space missing: the median [Stephan Thober, Germany]	Accepted - Text was revised with the suggested edit
44372	51	28	51	45	Space and reference year are missing in several places [Rita Man Sze Yu, China]	Thank you - Text was revised with the suggested edit
46684	51	28	51	28	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - text revised and changed to alternative wording
53672	51	28	51	28	The word "themedian" should be corrected as "the median" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
57048	51	28	51	28	missing space "themedian" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
30466	51	29	51	30	Roudier et al, 2014 (www.hydrol-earth-syst-sci.net/18/2789/2014/), reviewing 19 impact papers (with different scenarios and climate models) on West Africa conclude that there is a strong uncertainty in relative mean annual discharge change except for the Sassandra and Gambia River (slight increase) [France]	Taken into account - The suggested paper does not present projections under 1.5C & 2C global warming
6534	51	30	51	30	northernlatitudes' should be 'northern latitudes' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7564	51	30	51	30	…northern latitudes…. [Jens Zinke, Germany]	Not applicable - This section was rewritten
10704	51	30	51	30	Change to 'northern latitudes in parts of India,…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35078	51	30	51	30	The spacing is missing between the words "northernlatitude" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
35908	51	30			Add space between 'northern' and 'latitudes' [India]	Not applicable - This section was rewritten
35910	51	30	51	30	The reference Schleussner et al. (2016e) is not correct. The statements are from the paper Schleussner et al. (2016c) (Schleussner, C.-F., Lissner, T. K., Fischer, E. M., Wohland, J., Perrette, M., Golly, A., et al. (2016). Differential climate impacts for policy-relevant limits to global warming: the case of 1.5oC and 2oC. Earth System Dynamics 7, 327–351. doi:10.5194/esd-7-327-2016.). To be corrected accordingly. [India]	Accepted - Text was revised with the suggested edit
53674	51	30	51	30	The word "northernlatitudes" should be corrected as "northern latitudes" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This section was rewritten
56778	51	30	51	30	Missed spaces at a few places [Xiaolin Zhang, China]	Thank you - Text was revised with the suggested edit
57050	51	30	51	30	missing spaces "northernlatitudes" [AMANDINE PASTOR, France]	Editorial – copyedit to be completed prior publication
6536	51	31	51	31	decreasesof' should be 'decreases of' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
6538	51	31	51	31	annualstreamflow' should be 'annual streamflow' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7566	51	31	51	31	...decreases of 10–30% in the mean annual streamflow insert spaces [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
10706	51	31	51	31	Change to 'with decreases of 10–30% in the mean annual streamflow around the…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
21838	51	31			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
35080	51	31	51	31	The spacing is missing among the words "annualstreamflow" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
35912	51	31			Doell et al., year to be added. Add space between 'decrease' and 'of' and 'annual' anf 'streamflow' [India]	Accepted - Text was revised with the suggested edit
39740	51	31	51	31	The year of publication is missing in "Doell et al.". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
39742	51	31	51	31	Insert space before the "s" in "annualstreamflow". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
39968	51	31	51	31	Missing year "Doell et al." [Adi Nugraha, United States of America]	Accepted - Text was revised with the suggested edit

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40230	51	31	51	31	the year is missed in the reference "Doell et al." [Amal Hussein, Egypt]	Editorial – copyedit to be completed prior publication
40232	51	31	51	31	annualstreamflow must put spaces between the three words "annual" "stream" "flow" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
41722	51	31	51	31	spaces missing: decreases of 10-30% in the mean annual streamflow [Stephan Thober, Germany]	Accepted - Text was revised with the suggested edit
50926	51	31	51	31	year of publication is missing in reference in "Doell et al." [Amjad Masood, Pakistan]	Editorial – copyedit to be completed prior publication
53666	51	31	51	31	The word "annualstreamflow" should be corrected as"annual stream flow" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
53676	51	31	51	31	The word "annualstreamflow" should be corrected as "annual streamflow" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
57054	51	31	51	31	missing space "annualstreamflow" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
7310	51	32	51	35	None of these citations of our 2017 paper make sense!! How can substantial increases in runoff in the Scandinavian mountains be associated with decreases in runoff in Portugal!!?? These aren't related. The conclusions from this paper were that the only robust changes in mean runoff at 1.5 C were increases in the Scandinavian mountains and alps (as well as isolated parts of Eastern Europe) and decreases in Portugal. There is a slight increase in areas with changes to mean runoff between 1.5 and 2 C, particularly in eastern Europe/ western Russia. Regarding robust changes in low runoff (indicative of drought), these are only seen in very small parts of hte southwest Norwegian and Irish coasts and Andorra. Regarding robust changes in high runoff (indicative of risk for flooding) , these are projected to robustly increase over many localised parts of Europe, but the difference between 1.5 and 2C is not significantly discernible. Largest increases to high ruonff are projected along the central to eastern European Mediterranean coastal land regions, western Ireland and the southern Norwegian coastal land regions. (At higher levels of warming the areas of increase to high runoff become more continuous over most of continental Europe). [Chantal Donnelly, Australia]	Accepted - Text revised
3714	51	33	51	35	In addition, the increase in temperatures increases the risk of fires, and the disappearance of tree cover increases the runoff and its most harmful effects. [Castor Muñoz Sobrino, Spain]	Taken into account- text revised. The subsection was rewritten.
9612	51	33	51	33	I think the word "changes" is missing, that is, I suspect you meant to say "extent and severity of runoff changes" [Sean Fleming, United States of America]	Not applicable - This section was rewritten
41724	51	34	51	35	Donnelly et al. 2017 showed that there are decreases in Portugal and increases in Scandinavia, but not that the former are associated with the latter. The sentence starting with "Substantial increases…" needs to be rewritten. [Stephan Thober, Germany]	Taken into account - Text revised
3716	51	37			Insert and space before while [Castor Muñoz Sobrino, Spain]	Not applicable - This section was rewritten
6540	51	37	51	37	precipitationwhile' should be 'precipitation while' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10708	51	37	51	37	Change to 'in annual precipitation while they increase…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35082	51	37	51	37	There should be spacing between "precipitationwhile" . The correct expression is "precipitation while" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
39744	51	37	51	37	Insert space before the "w" in "precipitationwhile". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
41726	51	37	51	37	space missing: precipitation while [Stephan Thober, Germany]	Not applicable - This section was rewritten
56780	51	37	51	46	Missed spaces at a few places [Xiaolin Zhang, China]	Thank you - Text was revised with the suggested edit
57058	51	37			missing space "annual precipitationwhile" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
3718	51	38			Insert and space before because [Castor Muñoz Sobrino, Spain]	Not applicable - This section was rewritten
6542	51	38	51	38	regionsbecause' should be 'regions because' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10710	51	38	51	38	Change to 'Northern regions because of the snow melt contribution…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35084	51	38	51	38	The spacing is missing among the words "regionsbecause" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
39746	51	38	51	38	Insert space before the "b" in "regionsbecause", and after the point in "...of 1.5°C.Under..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
53678	51	38	51	38	The word "regionsbecause" should be corrected as "regions because" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This section was rewritten
57060	51	38	51	42	repeated missing spaces in each sentence [AMANDINE PASTOR, France]	Thank you - Text was revised with the suggested edit
62386	51	38	51	38	Instead of writing "melt contribution under global warming of 1.5°C.Under", please write "melt contribution under global warming of 1.5°C. Under" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
3720	51	39			Insert and space before show [Castor Muñoz Sobrino, Spain]	Not applicable - This section was rewritten
6544	51	39	51	39	Europeshow' should be 'Europe show' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10712	51	39	51	39	Change to 'regions in Europe show the strongest low flow increase…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
11994	51	39	51	40	Unclear what is meant by "variations in river runoff would enlarge.." - do you mean that differences in river runoff between basins in China will increase between 1.5 and 2 degrees? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - Text revised
35086	51	39	51	39	The spacing is missing among the words "Europeshow" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
39748	51	39	51	39	Insert space before the "s" in "Europeshow". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
41728	51	39	51	39	space missing: Europe show [Stephan Thober, Germany]	Not applicable - This section was rewritten
41730	51	39	51	39	Marx et al. (2017) also showed that the median increase in Alpine region in Europe is increased with global warming from 22% at 1.5 degree to 30% at 2 degree and 45% at 3 degree. [Stephan Thober, Germany]	Taken into account - Text revised
5598	51	41	51	41	river runoff…not riverrunoff [Sandra CASSOTTA, Denmark]	Not applicable - This section was rewritten
6546	51	41	51	41	riverrunoff' should be 'river runoff' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10714	51	41	51	41	Change to 'Their results indicate that annual river runoff is projected to increase in most areas…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35088	51	41	51	41	The spacing is missing among the words "riverrunoff" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
39750	51	41	51	41	Replace "riverrunoff" by "river runoff". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
41732	51	41	51	41	space missing: river runoff [Stephan Thober, Germany]	Not applicable - This section was rewritten
53668	51	41	51	41	The word "riverrunoff" should be corrected as "river runoff" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This section was rewritten
57062	51	41			Does river runoff in China also increases in other projections or only in Zhai et al ? [AMANDINE PASTOR, France]	Taken into account - See new references added: Betts et al (2018), Liu et al. (2017),Chen et al. (2017)
62388	51	41	51	41	Instead of writing "Their results indicate that annual riverrunoff is projected", please write "Their results indicate that annual river runoff is projected" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
50998	51	43	52	43	Please specify that it is in AR5 starting for example by "In AR5, Collins et al. ….." [Fatima Driouech, Morocco]	Taken into account - Text revised

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6548	51	44	51	44	levelson' should be 'levels on' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7804	51	44			should be a space between levels and on. [Anthony Lupo, United States of America]	Accepted - Text was revised with the suggested edit
10716	51	44	51	44	Change to 'above pre-industrial level son…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35090	51	44	51	45	The spacing is missing among the words "levelson" and "riverscovering" [Shaukat Ali, Pakistan]	Accepted - Sentence was revised
39752	51	44	51	44	Insert space before the "o" in "levelson". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
50928	51	44	51	44	...preindustrial levels on instead of "...preindustrial levelson" [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
53670	51	44	51	44	The word "levelson" should be corrected as "levels on" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
3722	51	45			Insert and space after rivers [Castor Muñoz Sobrino, Spain]	Accepted - Text was revised with the suggested edit
6550	51	45	51	45	riverscovering' should be 'rivers covering' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
10718	51	45	51	45	Change to 'on eight major rivers covering all continents and…' [Franklin Paredes, Brazil]	Accepted - Sentence was revised
28288	51	45	51	45	Please add that Antarctica has not been considered in this study. [Germany]	Taken into account - Text revised
39754	51	45	51	45	Insert space before the "c" in "riverscovering". [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
41734	51	45	51	45	remove covering all continents; Gosling et al. (2017) did not investigate catchments that are in Antarctica and neither catchments that cover entire continents. [Stephan Thober, Germany]	Taken into account - Text revised
53680	51	45	51	45	The word "riverscovering" should be corrected as "rivers covering" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Sentence was revised
1798	51	48	52	2	References must be included here for Rhine, Tagus, and Lena, to support the use of the term 'considerable evidence' in page 51, line 48. [Greece]	Accepted - text revised. The reference is Gosling et al. (2017)
6552	51	48	51	48	Mississippiis unclear' should be 'Mississippi is unclear' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
62390	51	48	51	48	Please the space between "unclear" and "There"; it seems too wide! [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Sentence was revised
7320	52		52		What about Australasia? Europe? In terms of reorganisation, I would suggest organising paragraphs by region, referring to changes indicated by global studies first and regional studies second where available. [Chantal Donnelly, Australia]	Taken into account - Text revised & reorganized
7314	52	1	52	4	This is in contrast with Donnelly et al. 2017 who found that projected changes to discharge from the Rhine and other European rivers were very uncertain and non-linear between 1.5, 2C and 3C. While Gosling et al. used GHMs, Donnelly et al. 2017 used a combination of regionally calibrated continental HMs and GHMs. (Further differences are in the GCM ensembles, regional downscaling and bias-adjustement used) [Chantal Donnelly, Australia]	Taken into account - Text revised
40238	52	1	52	14	spaces must be write between the words " andhigh", "resourcein", "Basinfor" and "ofvariations" [Amal Hussein, Egypt]	Accepted - Sentences were revised
286	52	2	52	4	REWORD this entire sentence. [Paul Doyle, Canada]	Accepted - Sentence was revised
6554	52	2	52	2	andhigh' should be 'and high' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9202	52	2			Please change "andhigh" to "and high" [Marco Turco, Spain]	Accepted - Sentence was revised
10720	52	2	52	2	Change to 'the magnitude of low and high flows, and…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21840	52	2		31	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Accepted - Text was revised to correct the connected words
24208	52	2	52	2	2°C.The" there is no gap between previous sentence and following sentence [Nazan AN, Turkey]	Not applicable - This section was rewritten
35092	52	2	52	13	The spacing is missing among the words "andhigh, combinedwith, innorthern, comparedwith, withthat, resourcein, ofvariations." [Shaukat Ali, Pakistan]	Accepted - Sentences were revised
39756	52	2	52	2	Insert space before the "h" in "andhigh". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
41736	52	2	52	2	space missing: and high [Stephan Thober, Germany]	Not applicable - This section was rewritten
44374	52	2	52	36	Space and reference years are missing in several places [Rita Man Sze Yu, China]	Accepted - Sentences were revised
56782	52	2	52	37	Missed spaces at a few places [Xiaolin Zhang, China]	Accepted - Sentences were revised
6556	52	4	5	4	combinedwith increases' should be 'combined with increases' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
6558	52	4	52	4	associated to warmer' should be 'associated with warmer' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9204	52	4			Please change "combinedwith" to "combined with" [Marco Turco, Spain]	Accepted - Sentence was revised
10722	52	4	52	4	Change to '(Rhine) combined with increases in evapotranspiration…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
41738	52	4	52	4	The results for the Rhine and Tagus are confirmed by Marx et al. (2017) for low flows and Thober et al. (2017) for high flows, which reported similar changes under global warming. [Stephan Thober, Germany]	Taken into account - Text revised
287	52	5	52	14	All of this info should be put into a separate paragraph. [Paul Doyle, Canada]	Taken into account - Text revised
9206	52	5			Please change "flows.Projected" to "flows. Projected" [Marco Turco, Spain]	Accepted - Sentence was revised
39758	52	5	52	5	Insert space after the point in "flows.Projected". [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
6560	52	6	52	6	innorthern' should be 'in northern' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
6562	52	6	52	6	comparedwith' should be 'compared with' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
9208	52	6			Please change "innorthen" to "in northern" and "flows.Projected" to "flows. Projected" [Marco Turco, Spain]	Accepted - Sentence was revised
10724	52	6	52	6	Change to 'catchment in northern China will decrease by 22% compared with that of…' [Franklin Paredes, Brazil]	Accepted - Sentence was revised
57066	52	6	52	14	continuous missing spaces between words [AMANDINE PASTOR, France]	Accepted - Sentences were revised
57068	52	6	52	14	missing link between china and south america change in streamflow [AMANDINE PASTOR, France]	Taken into account - Text revised
120	52	7	52	7	the2°C to be changed " the 2°C" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
6564	52	7	52	7	for the2°C scenario' should be 'for the 2°C scenario' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
24210	52	7	52	7	the2°C" there is no gap between the and 2°C [Nazan AN, Turkey]	Accepted - Text was revised with the suggested edit
6566	52	8	52	8	withthat' should be 'with that' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
9210	52	8			Please change "withthat" to "with that" [Marco Turco, Spain]	Accepted - Sentence was revised
10726	52	8	52	8	Change to 'compared with that…' [Franklin Paredes, Brazil]	Accepted - Sentence was revised
6568	52	10	52	10	water resourcesin the' should be 'water resources in the' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
6570	52	10	52	10	River Basinfor the' should be 'River Basin for the' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9212	52	10			Please change "resourcesin" to "resources in" and "Basinfor" to "Basin for" [Marco Turco, Spain]	Accepted - Sentence was revised

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10728	52	10	52	10	Change to 'changes of water resources in the Upper Yangtze River Basin for the same…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
6572	52	12	52	12	one. Montroull et al.)' should be 'one. (Montroull et al.)' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7808	52	12			Montrouli et al. , what year? [Anthony Lupo, United States of America]	Accepted - Reference was added
21842	52	12			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was added
35332	52	12			Montroul et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted - Reference was added
39760	52	12	52	12	The year of publication is missing in "Montroull et al.)". [Hernan Edgardo Sala, Argentina]	Accepted - year of publication was added
40234	52	12	52	12	the year is missed in the reference "Montroull et al.)" [Amal Hussein, Egypt]	Editorial – copyedit to be completed prior publication
6574	52	13	52	13	sign ofvariations in mean' should be 'sign of variations in mean' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9214	52	13			Please change "ofvariations" to "of variations" [Marco Turco, Spain]	Accepted - Sentence was revised
10730	52	13	52	13	Change to 'the sign of variations in mean streamflow…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
28290	52	13	52	14	The precipitation changes projected by different GCM and/or GCM/RCM combinations are very different, even in sign. Thus, the assessment of all changes related to precipitation highly depend on the GCM/RCM ensemble used for the analysis. E.g. the available ensembles for different CORDEX regions are very different in terms of the GCM used as boundary conditions and the RCMs used for the downscaling. The available ensemble strongly influences the results. This must please be mentioned in the text. [Germany]	Taken into account - Text revised. The uncertainty is indicated in the summary statement.
39762	52	13	52	13	Insert space before the "v" in "ofvariations". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
35	52	16	52	20	This paper was missed and is highly relevant to this section: Do, X., Westra, S. & Leonard, M. (2017). A global-scale investigation of trends in annual maximum streamflow. Journal of Hydrology, 552, 28-43. [Seth Westra, Australia]	Accepted - reference added
6576	52	16	52	16	runoff areavailable bothat basin' should be 'runoff are available both at basin' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9216	52	16			Please change "areaavailable" to "area available" and "bothat" to "both at" [Marco Turco, Spain]	Accepted - Sentence was revised
10732	52	16	52	16	Change to 'runoff are available both at basin or country…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
12866	52	16			There should be a space between "are" and "available" [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
12868	52	16			There should be a space between "both" and "at" [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised
35094	52	16	52	16	The spacing is missing among the words "areavailabe bothat" [Shaukat Ali, Pakistan]	Accepted - Sentence was revised
39764	52	16	52	16	Replace "areavailable" and "bothat" by "are available" and "both at", respectively. [Hernan Edgardo Sala, Argentina]	Accepted - Sentence was revised
40236	52	16	52	16	spaces must be write between areavailable bothat = "are" "available" "both" "at" [Amal Hussein, Egypt]	Accepted - Sentence was revised
41340	52	16	52	38	Same as above [Lourdes Tibig, Philippines]	Accepted - Text was revised with the suggested edit
57070	52	16	52	16	missing space "areavailable" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
41740	52	18	52	18	Marx et al. (2017) does not fit here because low flows are analyzed therein. [Stephan Thober, Germany]	Taken into account - Text revised
7316	52	19	52	20	Also Roudier et al. 2016 (at least for 2C) - (doi: https://doi.org/10.1007/s10584-015-1570-4), Donnelly et al. 2017 (high runoff is indicative of extreme runoff - at least in my experience the projections of mean annual high runoff always spatiallly match the changes in extreme runoff) [Chantal Donnelly, Australia]	Taken into account - Text revised
9218	52	20			Please change "Kundzewicz et al.,," to "Kundzewicz et al.," [Marco Turco, Spain]	Not applicable - This text was deleted
12870	52	20			Kundzewicz et al.,, there is an extra "," [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
35334	52	20			Alfieri et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Not applicable - This text was deleted
41742	52	20	52	20	The papers listed here should all explicitly analyze changes in flooding for different levels of global warming. This is not the case for at least Alfieri et al. (2015a). Thober et al. (2017) should be mentioned here because results therein are presented for entire Europe. [Stephan Thober, Germany]	Taken into account - Text revised
1800	52	21	52	21	Clarify here what you mean by 'high greenhouse gas concentration scenario'. [Greece]	Accepted - Sentence was revised and clarified
9220	52	22			Please change "(Hirabayashi et al., 2013).In" to "(Hirabayashi et al., 2013). In" [Marco Turco, Spain]	Not applicable - This section was rewritten
53106	52	22	52	22	Using the RCP4.5 and RCP8.5 climate projections of five CMIP5 GCMs for the 2041–2100 period, Gizaw and Gan (2016) found that the flood quantile is projected to increase by about 7% for the southeastern British Columbia and 29% for southern Ontario region of Canada in the mid- and late 21st century. Gizaw, M., and Gan, T. Y., 2016, Regional Flood Frequency Analysis using Support Vector Regression under historical and future climate, Journal of Hydrology, 538, 387-398, dx.doi.org/10.1016/j.jhydrol.2016.04.041. Gizaw, M., and Gan, T. Y., 2016, Impact of Climate Change and El Niño Episodes on Droughts in sub-Saharan Africa, Climate Dynamics, Springer, DOI: 10.1007/s00382-016-3366-2. [Thian Gan, Canada]	Rejected - outside the scope of the section. Only projections under 1.5C & 2C is considered
62392	52	22	52	22	Please widen the space between "(Hirabayashi et al., 2013)" and ".In" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6578	52	23	52	23	SouthAmerica' should be 'South America' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
57072	52	23			southamerica [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
39766	52	24	52	24	Insert space after the closing parenthesis in "...2015)and" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
57074	52	24			missing space "(Huang et al., 2015)and" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
6580	52	25	52	25	associated toincreases in magnitude' should be 'associated with increases in magnitude' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7568	52	25	52	25	...associated to increases… insert spaces heer and on entire paragrpah starting from line 16-32 [Jens Zinke, Germany]	Not applicable - This section was rewritten
9222	52	25			Please change "toincreases" to "to increases" [Marco Turco, Spain]	Not applicable - This section was rewritten
10734	52	25	52	25	Change to 'associated to increases in magnitude…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
53664	52	25	52	25	The word "toincreases" should be corrected as "to increases" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This section was rewritten
56310	52	25	52	25	Change "to" to "with", so that it reads: "associated with increases" [Annika Herbert, Australia]	Not applicable - This section was rewritten
57076	52	25			missing space "toincreases" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
6582	52	26	52	26	Asiashow a significant' should be 'Asia show a significant' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9224	52	26			Please change "Asia show" to "Asia shows" [Marco Turco, Spain]	Not applicable - This section was rewritten
10736	52	26	52	26	Change to 'basin in south Asia show a significant….' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
12038	52	26	52	29	Is it possible to quantify these differences in flooding e.g. flooding frequency? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - No literature available to answer the question
35096	52	26	52	28	The spacing is missing among the words "Asiashow, inthe, magnitudegreater" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39768	52	26	52	26	Replace "Asiashow" by "Asia show". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
53656	52	26	52	26	The word "Asiashow" should be corrected as "Asia show" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This section was rewritten
53662	52	26	52	26	The Ganges-Brahmaptura-Meghna" are three large basins and therefore, it is more appropraite to use "basins" instead of "basin" [AKM SAIFUL ISLAM, Bangladesh]	Not Applicable - sentence removed as the Uhe et al. paper was still under review by the cut-off date
6584	52	27	52	27	increase inthe area flooded' should be 'increase in the area flooded' [Robert Shapiro, United States of America]	Not applicable - This sentence was rewritten
9226	52	27			Please change "inthe" to "in the" [Marco Turco, Spain]	Not applicable - This section was rewritten
10738	52	27	52	27	Change to 'increase in the area flooded at…' [Franklin Paredes, Brazil]	Not applicable - This sentence was rewritten
12872	52	27			…both 1.5°C or 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence was revised
16084	52	27	52	28	Rewrite as "Floods are likely to be more frequent and flood magnitudes greater at 2.0°C" You cannot say anything "will" happen, can only discuss in conditional terms, because these outcomes are scenario-dependent, and only probable not certain. [Australia]	Taken into account - Text revised
35336	52	27			Uhe et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Not applicable - This text was deleted
53660	52	27	52	27	The word "inthe" should be corrected as "in the" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This sentence was rewritten
6586	52	28	52	28	magnitudesgreater' should be 'magnitudes greater' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9228	52	28			Please change "magnitudesgreater" to "magnitudes greater" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10740	52	28	52	28	Change to 'flood magnitudes greater at….' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
12874	52	28			There should be a space between "magnitudes" and "greater" [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
12876	52	28			…magnitudes greater at 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
39770	52	28	52	28	Replace "magnitudesgreater" by "magnitudes greater". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
53658	52	28	52	28	The word "magnitudesgreater" should be corrected as "magnitudes greater" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
57078	52	28			missing space "magnitudesgreater" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
17648	52	29	52	32	The impact of storm surge should also be mentioned in relevant sentence. Suggest rephrasing as “In coastal regions, increases in heavy precipitation associated with tropical cyclones (Section 3.3.7) combined with increased sea levels (Section 3.3.10) and higher risk of storm surge may lead to increased flooding.” [Sai Ming Lee, China]	Taken into account - Section 3.3.9 on Sea level includes discussion on storm surges
21844	52	31			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was revised
35338	52	31			Thober et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted - Year of publication was added
39772	52	31	52	31	The year of publication is missing in "Thober et al." [Hernan Edgardo Sala, Argentina]	Accepted - Year of publication was added
41744	52	31	52	31	year missing: Thober et al. (2017) [Stephan Thober, Germany]	Accepted - Year of publication was added
51000	52	31	65	31	Southern Europ is part of Meditterranean. The sentence can be modifyed like this "Eastern North America, Central Europe, the Mediterranean (including Southern Europe and North Africa, …), Western and Central Asia [Fatima Driouech, Morocco]	Taken into account - Text revised
7318	52	34	52	38	See the General comment. This whole section needs to be reorganised. [Chantal Donnelly, Australia]	Taken into account - Text revised. The section was rewritten.
30468	52	34	52	38	Please note that this is for a +2C scenario [France]	Taken into account - Text revised
288	52	36	52	38	.....Russia and northern Sweden. Some coastal areas in Norway may experience insignificant flood increases (Roudier et al., 2016). [Paul Doyle, Canada]	Accepted - Text was revised with the suggested edit
6588	52	36	52	36	in most ofFinland,' should be 'in most of Finland,' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9230	52	36			Please change "ofFinland" to "of Finland" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10742	52	36	52	36	Change to 'to decrease in most of Finland, NW Russia and North…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
30470	52	36	52	36	Typo: Add a space between "of" and "Finland" [France]	Accepted - Text was revised with the suggested edit
34678	52	36			Please separate every woed "ofFinland" [Mexico]	Accepted - Text was revised with the suggested edit
35098	52	36	52	36	The spacing is missing among the words "ofFinland" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
39774	52	36	52	36	Replace "ofFinland" by "of Finland". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
50930	52	36	52	36	..most of Finland... instead of "...most ofFinland.." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
55306	52	36	52	36	Add space: "off Finland" [ELISA BERDALET, Spain]	Accepted - Text was revised with the suggested edit
56312	52	36	52	36	Change "south of" to "southern". [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit
56314	52	36	52	36	Change "North of" to "Northern". [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit
62394	52	36	52	36	Please widen the space between "ofFinland," and "Finland," [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6590	52	37	52	37	coastalareas' should be 'coastal areas' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9232	52	37			Please change "coastal areas" to "coastal areas" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10744	52	37	52	37	Change to 'some coastal areas in Norway…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
40240	52	37	52	37	space between "coastalareas" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
57082	52	37			missing space "coastalareas" [AMANDINE PASTOR, France]	Accepted - Text was revised with the suggested edit
3550	52	41	53	17	Section 3.3.6 is very short, contrarily to other previous sections, while there is litterature on the topic. I think at least one paragraph about the observed changes should be included. I refer the authors to the SWIPA report for Arctic snow and permafrost changes (https://www.amap.no/documents/doc/snow-water-ice-and-permafrost-in-the-arctic-swipa-2017/1610). [David Docquier, Belgium]	Not applicable. This whole subsection has now been combined with runoff and hydrology. There is a limited amount of literature directly related to 1.5/2.0C.
9616	52	41	53	17	Section 3.3.6, "Snow and permafrost", should be relabelled "Snow, permafrost, and mountain glaciers" and include some summary information on the latter. It is widely understood by the water resources and freshwater ecology communities that glaciers form the core of continental-scale "water towers" in the Himalayas, Alps, Andes, and Northern Rockies. Just the icefields in the mountains around the Tibetan Plateau alone are headwaters to the Indus, Ganges, Brahmaputra, and Yangtze, helping provide water to a few billion people - a significant fraction of the global population. Recession of these glaciers under climate change has major water resource implications. For a recent synposis, see (and cite) Chapter 8 of Fleming (2017, Where the River Flows: Scientific Reflections on Earth's Waterways, Princeton University Press, Princeton, NJ). Glaciers and glacier change also have significant implications to both freshwater and marine ecosystems; see (and cite) the recent review article by O'Neel et al. (2015, Bioscience, 65: 499-512). [Sean Fleming, United States of America]	Not applicable. This whole subsection has now been combined with runoff and hydrology. The impacts that the review lists are covered in 3.4 etc.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16086	52	41	53	17	The subsection “Snow and Permafrost” is not given sufficient substance, more up-to-date references are required and the subsection needs to be expanded. [Australia]	Not applicable. This whole subsection has now been combined with runoff and hydrology. There is a limited amount of literature directly related to 1.5/2.0C.
35100	52	41	52	41	Following relevant study can be cited under the section: The snow water equivalent will decrease in over half of the regions in the Northern Hemisphere but increase only slightly in the Central Siberian Plateau. The snow water equivalent will decrease significantly (more than 40% relative to 1986–2005) in central North America, western Europe, and northwestern Russia. The permafrost area in the Qinghai–Tibet Plateau will decrease by 0.15 × 106 km2 (7.28%), 0.18 × 106 km2 (8.74%), and 0.17 × 106 km2 (8.25%), respectively, in RCP2.6, RCP4.5, RCP8.5. The snow water equivalent in winter (DJF) and spring (MAM) over the Qinghai–Tibet Plateau will decrease by 14.9% and 13.8%, respectively. [Shaukat Ali, Pakistan]	Not applicable - this paragraph was deleted due to space constraints. No reference provided for this information.
49430	52	41	53	17	The section 3.3.6: Consider to include into this section results from additional studies, which can increase the robustness of conclusions. Particularly, the following references are of interest: Arzhanov et al., 2013, doi: 10.3103/S1068373913070030; Peng et al., 2018, doi: 10.1175/JCLI-D-16-0721.1. In addition, transient hysteresis of permafrost response to external forcing is worth to mention in relation to the possible warming overshoot (see the following paper: Eliseev et al., 2014, doi: 10.1007/s00382-013-1672-5). The following literature can be also used in the 3.4.3.4. section. [Alexander Chernokulsky, Russian Federation]	Not applicable - this paragraph due to space constraints. Comment is useful but not directly related to 1.5/2.0C. Relevant to SROCC?
53108	52	41	52	49	Based on the Community Climate System Model (CCSM)’s simulation of the 20th and 21st century (SRES A1B scenario) climate, Lawrence and Slater (2009) found increased winter snowfall (+10–40 percent), decreased maximum snow depth (?5 ± 6 cm), and a shortened snow-season (?14 ± 7 days in spring, +20 ± 9 days in autumn). They found that increasing snowfall counters the predominantly snowpack thinning influence of warmer winters and shorter snow seasons (see Chapter 10 of Barry and Gan, 2011). Barry, R., and Gan, T. Y., 2011, Global Cryosphere, Past, Present and Future, 472 pages, Cambridge University Press, ISBN: 9780521769815 (Hardcover) [Thian Gan, Canada]	Not applicable - this paragraph deleted because of space constraints. Literature mentioned not directly relevant to 1.5/2.0C.
289	52	43	52	43	SCE acronym for "seasonal snow cover"??? Gets back to earlier comment about acronyms and glossary. I could not find reference to this acronym in Report glossary. Lingo is everywhere throughout chapter and no easy way for readers to unlock the code. [Paul Doyle, Canada]	Not applicable - this paragraph deleted.
7236	52	43	53	6	The paragraph on snow cover only deals with large scale snow cover extent change. This is certainly valid from a climate feedback standpoint, but much less on a regional/local hydrology, winter tourism and natural hazards (avalanche) perspective. Two recent studies are suggested, which provide relevant information to address the impact of 1.5 / 2°C warmer world quantitatively. Verfaillie et al. (The Cryosphere Discussions 2017, rievised on February 12 2018, with minor revisions required - available upon request), processed 30 EUROCORDEX GCM/RCM pairs spanning RCP2.6, RCP4.5 and RCP 8.5, which were downscaled againts a local reanalysis and used to feed the detailed snowpack model Crocus. Results in terms of 30 years average 2010-2040, 2040-2070 and 2070-2100 were compared to results of the 1986-2005 reference period, in terms of mean winter snow depth, peak snow water equivalent etc. at 1500 m altitude in the Northern French Alps. Using global temperature of the driving GCMs of the period 1850-1880 as a pre-Industrial baseline, the change in 30-years average mean winter snow depth (using the reference 1986-2005) is -24%+/- 12 for 1.5°C global warming, and -32% +/- 10 for 2°C global warming. Changes were also computed for peak SWE (-18% vs -23%) and for season duration (-23 days vs -34 days) etc. Interestingly, the change in mean winter snow depth between the two global warming levels (1.5 vs 2) is found to be 75%, consistent with the final statement of this paragraph, with values on the order of 80% for peak SWE and 70% for snow cover duration at this altitude and location. Note also significant change for winter pecipitation, but significant changes for local temperature changes. Changes were found to be linear wrt global warming rate, neither depending on the RCP nor on the lead time into the 21st century (no or very limited lag / histeresis at this altitude/location where snow is exclusively seasonal). Recent articles from Marty et al. (The Cryosphere, 2017) or Terzago et al. (The Cryosphere, 2017), can provide further hints into this issue, although they do not explicitly provide direct linkages between local changes in snow conditions and global warming level. [Samuel MORIN, France]	Not applicable. This whole subsection has now been combined with runoff and hydrology. The impacts that the review lists are covered in 3.4, 3.5 etc.
34008	52	43	52	43	It is written «...the seasonal snow cover (SCE,....)», while we assume SCE stands for Snow Cover Extent. Please consider to correct the wording to match the acronym. [Norway]	Not applicable - this paragraph deleted.
34010	52	43	68	37	Please be consistent on using the degree sign for temperature. Same for other units, e.g. either million or 10^6. [Norway]	Not applicable - This sub-section was deleted
41342	52	45	52	47	Rephrase-make it more concise. [Lourdes Tibig, Philippines]	Not applicable - This sub-section was deleted
16088	52	46	52	46	The authors refer heavily to CMIP5 results, where they really should consider the CMIP6 results. For an overview of CMIP6 see: Eyring, V., Bony, S., Meehl, G. A., Senior, C. A., Stevens, B., Stouffer, R. J., and Taylor, K. E.: Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) experimental design and organization, Geosci. Model Dev., 9, 1937-1958, doi:10.5194/gmd-9-1937-2016, 2016. A special issue on CMIP6 (Coupled Model Intercomparison Project Phase 6 (CMIP6) Experimental Design and Organization) has also been published (https://www.geosci-model-dev.net/special_issue590.html) [Australia]	Rejected - CMIP6 analysis not yet available. The Eyring paper is simply a description of experimental design NOT results.
34012	52	48	52	49	It is written that the snow reduction in coverage is linked to precipitation and temperature changes. We would consider adding also the phase changes (from snow to rain). This is also important since heavy rain or melt refreeze of ice layers have fairly different thermal and optical properties, leading to considerable feedback processes (with atmosphere, glaciers and land systems). That could also pinpoint the fact the current global climate models have large uncertainties when considering snow cover extent (SCE), as the physical properties of snow are poorly described and taken into account. [Norway]	Not applicable - this paragraph due to space constraints. Comment is useful but not directly related to 1.5/2.0C. Relevant to SROCC.
34014	53	1	53	2	Please consider substituting «This interaction is», with «These interactions are» instead [Norway]	Not applicable - This sub-section was deleted
34016	53	1	53	2	Please consider to add a coma after snowmelt, to make sure the reader balances both side of the sentence; «snow and more snowmelt, countered by projected increases in snowfall...» [Norway]	Not applicable - sentence deleted.
34018	53	1	53	6	What are the numbers in km2 associated with a 1.5 or 2C warming in terms of loss of SCE? It could be interesting to have that information so that comparison with permafrost loss can be apparent, as permafrost and snow are extremely connected. [Norway]	Not applicable - discussion on SCE deleted
21846	53	2			insert space between "snowmelt" [LUIS VALDES, Spain]	Not applicable - This sub-section was deleted
28292	53	2	53	6	This is a very rough estimate derived from the results of one model. This uncertainty should be highlighted more specifically. [Germany]	Noted - the wording makes it clear that the results stem from one model (CESM).
34020	53	2	53	6	There is year in the Wang et al publication. Please add this. [Norway]	Not applicable - This sub-section was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53110	53	2	53	2	Besides projections based on climate model simulations, it will be helpful to comment on reent observed changes in snowpacks. For example, from trend analysis of snow water equivalent (SWE) retrieved from passive microwave SSM/I data for North America between 1979 and 2007, Gan et a. (2013) detected about 30% of decreasing trends of SWE for 1979–2007 that are statistically signi?cant; & more extensive in Canada than in USA. Mean trend magnitudes for Dec–April were about -0.4 to -0.5 mm/yr, e.g., a reduction of snow depth of about 5–8 cm in 30 years, which will affect river basins relying on spring snowmelt for water supply. Decreasing trends in SWE have been mainly due to warming. Climate anomalies such as AO, NAO, PDO & PNA can affect SWE trends of Northern Hemisphere. Gan, T. Y., Barry, R., Gobena, A., and Rajagopalan, B., 2013, Changes in North America Snowpacks for 1979-2007 Detected from the Snow Water Equivalent data of SMMR and SSM/I Passive Microwave & related Climatic Factors, J. Geophysic. Research-Atm. 118(14), 7682-7697. DOI:10.1002/jgrd.50507. Lawrence, D. M. and Slater, A. G. 2009. The contribution of snow condition trends to future ground climate, Clim. Dynam., 34: 969–81. [Thian Gan, Canada]	Noted - this would be interesting however space constraints limit discussion solely to 1.5/2.0C. Relevant to SROCC?
290	53	3	53	3	.....Wang et al. submittted ?? [Paul Doyle, Canada]	Not applicable - This sub-section was deleted
7810	53	3			Wang et al. what year? [Anthony Lupo, United States of America]	Noted - this is an issue with referencing software.
17376	53	3	53	4	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This sub-section was deleted
44376	53	3	53	3	Year is missing "Wang et al.)," [Rita Man Sze Yu, China]	Not applicable - This sub-section was deleted
50932	53	3	53	3	year of publication is missing in reference in "Wang et al." [Amjad Masood, Pakistan]	Noted - this is an issue with referencing software.
54696	53	3			Wang et al. reference correction [Qudsia Zafar, Pakistan]	Noted - this is an issue with referencing software.
291	53	6	53	6	.....roughly 70% that..... [Paul Doyle, Canada]	Not applicable - This sub-section was deleted
35102	53	7	53	18	When the global average surface temperature rises by 1.5 °C, the southern boundary of the permafrost will move 1–3.5° northward (relative to 1986–2005), particularly in the southern Central Siberian Plateau. The permafrost area will be reduced by 3.43 × 106 km2 (21.12%), 3.91 × 106 km2 (24.1%) and 4.15 × 106 km2 (25.55%) relative to 1986–2005 in RCP2.6, RCP4.5 and RCP8.5, respectively. Reference: Ying Kong and Cheng-Hai Wang (2017). Responses and changes in the permafrost and snow water equivalent in the Northern Hemisphere under a scenario of 1.5 °C warming. Advances in Climate Change Research, 8, Pages 235-244 [Shaukat Ali, Pakistan]	Noted - subsection removed due to space constraints.
7322	53	8	53	17	Donnelly et al. showed robust decreases in snowpack over all parts of Europe that currently have Winter snowpack at 1.5 C and these changes become large at 2 C (although there is some dependence on the results to the choice of RCMs behind the warming threshold ensemble). Arheimer et al. 2017 noted that globally, the effects of hydropower regulation on river discharge seasonality ahave a very similar effect to climate change impacts due to snowpack and snowmelt changes. This means that the anthropogenic impacts are every bit as an important as snow changes. Existing hydropower infrastructure coudl even be used to reverse these changes if the political will were there (doi:10.1038/s41467-017-00092-8, also relevant for Section 3.4.9.1.2) . [Chantal Donnelly, Australia]	Noted - impacts are covered in 3.4.
9380	53	8	54	11	Poor terminology used here - "….extent of near-surface permafrost shrinking"??? This makes no sense given permafrost has considerable thickness (would you refer to near-surface glacier shrinking?). The models on which this is based essentially consider deepening of thaw (up to 3 m) [Sharon Smith, Canada]	Accepted - however this line was deleted for the FGD because it only summarises AR5.
41344	53	8	53	17	It is suggested this literature review be transformed into an assessment. [Lourdes Tibig, Philippines]	Not applicable - This sub-section was deleted
42786	53	8	53	17	Helpful to compare the values from Chadburn with either the permafrost already lost and/or the present extent of permafrost (for contextualizing the gravity of the loss). [Kristin Campbell, United States of America]	Noted - revised text in 3.6 provides comparison.
43018	53	8	53	17	Helpful to compare the values from Chadburn with either the permafrost already lost and/or the present extent of permafrost (for contextualizing the gravity of the loss). [Durwood Zaelke, United States of America]	Noted - revised text in 3.6 provides comparison.
53112	53	8	53	17	As greenhouse gas concentrations rise, terrestrial Arctic temperatures are projected to rise between 3-8 °C by 2100. Soil warming has been found to be mostly lower than near-surface air warming due to thermal damping of warming signal by soil heat capacity. Using climate projections of six GCMs, Zhang et al. (2008) found that in Canada permafrost thaw from the top would be significant and respond quickly to climate warming, but deep permafrost would persist for a long time. The predicted reduction in permafrost extent by 2100 was ? 20–24 %, despite air temperature changes of 2.8–7.0 °C In the Arctic, the extent and rapidity of recently observed changes, which include the degradation of frozen ground previously stable for thousands of years suggest that Arctic landscapes may be particularly sensitive to global warming. However, the extent to which ice-rich permafrost degrades in response to strong high-latitude warming over the next 100 years remains highly uncertain, partly due to its dependence on changes in snow cover which is difficult to predict. Zhang, Y., Chen, W. and Riseborough, D.W. 2008. Transient projections of permafrost distribution in Canada during the 21st century under scenarios of climate change. Global Planet. Change, 60(3–4): 443–56. [Thian Gan, Canada]	Noted - space constraints mean that discussion had to be limited to 1.5/2.0C. Relevant to SROCC?
55990	53	8	53	17	Cite carbon amoiunts and budget per previous comments. [Pamela Pearson, United States of America]	Not applicable - This sub-section was deleted
61862	53	8	53	17	Need to coordinate with chapter 2 for section 2.6 (permafrost carbon feedback) to have a consistent assessment for permafrost changes. [Valérie Masson-Delmotte, France]	Noted - have coordinate text with Chpt 2
28294	53	9	53	9	Please define "near-surface permafrost". [Germany]	Not applicable - text deleted in order to meet space constraints.
34022	53	10	53	11	Considering the strong link between the snow and permafrost physical system, it is in a way logic that permafrost shrinking has a confidence level to medium, since snow does as well on page 52 lines 45-46. This is not only a lack of representation of soil physics in the climate models, but also a lack of snow physic. [Norway]	Noted - unclear what changes are requested.
9382	53	12	53	15	Incorrect statement "fractional cover of permafrost" - Permafrost is a subsurface characteristic of the ground. Permafrost underlies the land surface or land area. The permafrost regions may cover the landmass but it isn't clear this is what the authors mean. Is the size of the permafrost regions decreasing or the actual area underlain by permafrost decreasing? (these are 2 different things) [Sharon Smith, Canada]	Noted - this wording was taken from the original paper.
9384	53	15	53	17	It should be clear here that these conclusions are associated with equilibrium conditions (may take centuries to millenia to get there). [Sharon Smith, Canada]	Noted - this is implicit in the use of the word 'stabilized'
24212	53	15	53	15	1.5oC and 2oC" the degree has different font [Nazan AN, Turkey]	Not applicable - This sub-section was deleted
292	53	16	53	16	.....levels, respectively, ... [Paul Doyle, Canada]	Not applicable - This sub-section was deleted

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17378	53	16	53	16	Expression of error is inconsistent throughout. Sometimes confidence intervals, sometimes SE, sometimes sigma. Obviously, the conventions vary in the underlying literature, but could this be resolved/standardised for this report? [David Schoeman, Australia]	Noted - ranges drawn from original papers - ideally everything would be consistent but limited by material that is available.
28296	53	16	53	17	Message on permafrost not considered in the ES. Please add in ES: "It is virtually certain (Collins et al., 2013) that projected warming in the northern high latitudes combined with changes in snow cover will lead to the extent of near-surface permafrost shrinking." with relevant specifications for 1.5 / 2C. [Germany]	Noted - permafrost is covered in ES
34024	53	16	53	17	The results of 21-37 % or 35-47% of loss of permafrost seems to be by 2100, as written in page 66 line 29. That information should also be given here. It also seems that the 21-37% is the level from 1.5 C warming and 35-47% a results if 2C warming? If not, please consider to clarify this. The numbers are also not consistent to what is found further in the report, please consider to check for consistency. Finally, perhaps the sentence could be turned the other way aroung and rephrased to something like; "2C warming will have a further decrease of roughly 4 x 10^6 km2." [Norway]	Accepted - discussion of permafrost now combined into 3.6
34026	53	16	53	17	Numbers here says 4 x 10^6 km2 decrease of permafrost extent from 1.5 to 2C warming, while in Box 3.5, page 67 lines 49, it is written 2.6-6.8 x 10^6 km2 at 1.5 C and 4.4-8.6 x 10^6 km2 at 2C. Please consider to state where the difference in these numbers comes from. [Norway]	Accepted - text revised.
293	53	17	53	17	.....20 C world would have. [Paul Doyle, Canada]	Not applicable - This sub-section was deleted
2264	53	17	53	17	Permafrost extent as such is relatively irrelevant for most people. What count is permafrost carbon release. You might refer to the appropriate sections and chapters here. [gerhard Krinner, France]	Noted - these aspects are covered in 3.5.
24214	53	17	53	17	1.5oC and 2oC" the degree has different font [Nazan AN, Turkey]	Not applicable - This sub-section was deleted
55788	53	17			4 x 10^6 here is a wrongly quoted result. The result was 2 x 10^6 km^2 [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text revised.
608	53	20	55	18	I think this section should be better placed after section 3.3.3. dealing with precipitation and monsoons. [Maria Jesus Iglesias Briones, Spain]	The section follows after sections on rainfall, drought and run-off, which the SR1.5 authors have deemed to be the most appropriate outlay.
19100	53	20	55	15	The following study investigated the global response of the midlatitude atmospheric circulation (jet streams, storm tracks and stationary waves) to 1.5 C and 2.0 C of warming using the HAPPI ensemble.It may be useful for this section. Li, C. et al. Midlatitude atmospheric circulation responses under 1.5°C and 2.0°C warming and implications for regional impacts. Earth Syst. Dynam., submitted (Contact: Camille Li <camille@uib.no>) [HIDEO SHIOGAMA, Japan]	Many thanks for the reference - the findings from Li et al. (2017) have been incorporated in the text.
49432	53	20	55	15	The section name is 'Tropical cyclones, extratropical cyclones and winds'; however, there is no information on 'extratropical cyclones' at all. This information has to be added into the section. Moreover, this subject is thoroughly analyzed in recent years (e.g.: Ulbrich et al., 2013, doi: 10.1127/0941-2948/2013/0420; Akperov et al., 2015, doi: 10.1007/s00704-014-1272-2; Lehmann et al., 2014, doi: 10.1088/1748-9326/9/8/084002; Wang et al., 2017, doi: 10.1175/JCLI-D-16-0650.1; Basu et al., 2018, doi: 10.1002/2017EF000670 etc.). The atmospheric fronts responce to the warming can be also highlighted (see: Schemm et al., 2017, doi: 10.1175/BAMS-D-12-00134.1). [Alexander Chernokulsky, Russian Federation]	The section has been extended to include an assessment of changes in extra-tropical cyclone attributes, however with a focus on changes projected for 1.5 vs 2 degrees C of global warming.
49434	53	20	55	15	Consider to expand this section with the topic on mesoscale convective storms ('severe convective storms') responce to the 1.5ºC warming. Despite these events include not only wind events (like tornadoes, gust fronts, downbursts and microbursts) but hail and heavy precipitation events, this section is the most appropriate for this topic. These events are univocal hazardous, worldwide distributed and have high impact on economies and society. Thus, this events should be highlighted in the report (in terms of their response to the 1.5ºC warming). The following literature can be evaluated: Diffenbaugh et al., 2013, doi: 10.1073/pnas.1307758110; Li and Colle, 2016, doi: 10.1175/JCLI-D-14-00831.1; Strader et al., 2017, doi: 10.1007/s10584-017-1905-4; Pú?lk et al., 2017. doi: 10.1175/JCLI-D-16-0777.1; Chernokulsky et al., 2017, doi: 10.1134/S1028334X17120236; Seelay and Romps, 2015, doi: 10.1175/JCLI-D-14-00382.1. [Alexander Chernokulsky, Russian Federation]	In depth analysis of changes in intense meso-scale systems (such as tornadoes) under 1.5 vs 2 degrees C of global warming falls beyond the scope of SR1.5 and this section, which deals only with tropical cyclones and extra-tropical cyclones.
49436	53	20	55	15	Consider to analyze the response of blocking events to the he 1.5ºC warming. Blocking anticyclones are the major cause of heatwave and coldspells at midlatitudes. Some information should be added to the report on these phenomena. There is no 'the best place' for this analysis right now. However, the section 3.3.7. is the most suited for this (since it deals with dynamical atmospheric features). The following literature can be evaluated: Masato et al., 2013, doi: 10.1175/JCLI-D-12-00466.1; Dunn-Sigouin and Son, 2013, doi: 10.1002/jgrd.50143; Mokhov et al., 2014, doi: 10.1016/j.gloplacha.2014.09.004; Parsons et al., 2016, doi: 10.1175/JCLI-D-15-0754.1; Li et al., 2017, doi: 10.1007/s00704-017-2079-8; Lee and Ahn, 2017, doi: 10.1002/joc.4878. [Alexander Chernokulsky, Russian Federation]	In depth analysis of changes in blocking highs under 1.5 vs 2 degrees C of global warming falls beyond the scope of SR1.5 and this section, which deals only with tropical cyclones and extra-tropical cyclones.
1012	53	22	53	28	Talks about "a decrease in the overall number of tropical cyclones in the North Indian Ocean basin, based on the observational records". This is based on earlier studies/data, and new research shows that there is an increase in the frequency of extremely severe cyclonic storms over the Arabian Sea (Murakami et al. 2017). This increase in the frequency is linked to a decrease in vertical wind shear over the Arabian Sea as a response to anthropogenic warming. Reference: Murakami, H., Vecchi, G. A., & Underwood, S. (2017). Increasing frequency of extremely severe cyclonic storms over the Arabian Sea. Nature Climate Change, 7(12), 885. [Roxy Mathew KOLL, India]	Many thanks for this reference, the findings from Murakani et al. (2017) are now described in the text.
5510	53	22	53	28	The paragraph talks about "increasing evidence", but it is not clear if this evidence is to have been assessed to have increased since the AR5 assessment (about 4 years ago) ; suggest putting such statement that are not specific to the 1.5 and 2C in the context of the AR5 assessment. Has there been any change indicated in this paragraph since the AR5, and if not what is it's purpose? [Haroon KHESHGI, United States of America]	The statement of "increasing evidence" has been removed from the text. The assessment made in the revised chapter is one of low confidence in an observed increase in very intense tropical cyclones.
41346	53	22	53	28	It is to be noted that the confidence in these trends is till with low confidence due to limitations (e.g.,based on 30-year observations [Lourdes Tibig, Philippines]	The final SR1.5 assessment indeed assigns low confidence in all trends described in the report for tropical cyclone attributes.

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35914	53	22	53	28	“a decrease in the overall number of tropical cyclones in the North Indian Ocean basin, based on the observational records”. This is based on earlier studies/data, and new research shows that there is an increase in the frequency of extremely severe cyclonic storms over the Arabian Sea (Murakami et al. 2017). This increase in the frequency is linked to a decrease in vertical wind shear over the Arabian Sea as a response to anthropogenic warming. More citations need to be added to substantiate this. Consider references: Klotzbach, P.J. and C.W. Landsea, 2015: Extremely Intense Hurricanes: Revisiting Webster et al. (2005) after 10 Years. J. Climate, 28, 7621–7629,https://doi.org/10.1175/JCLI-D-15-0188.1 Klotzbach, P. J., 2006: Trends in global tropical cyclone activity over the past twenty years (1986-2005), Geophys. Res. Lett., 33, L10805, DOI:10.1029/2006GL025881 Kamahori, H., N. Yamazaki, N. Mannoji, and K. Takahashi, 2006: Variability in intense tropical cyclone days in the western North Pacific. SOLA, 2, 104-107, doi:10.2151/sola.2006-027. Mohapatra M., Srivastava A.K., Balachandran S., Geetha B. (2017) Inter-annual Variation and Trends in Tropical Cyclones and Monsoon Depressions Over the North Indian Ocean. In: Rajeevan M., Nayak S. (eds) Observed Climate Variability and Change over the Indian Region. Springer Geology. Springer, Singapore Mohapatra et al. (2017) found that during the period 1961–2010, cyclonic disturbances (CDs), tropical cyclones (TC) and severe tropical cyclones over the Bay of Bengal and North Indian Ocean show significant decreasing trends for the monsoon and post-monsoon seasons and the year as a whole. Significant increasing trend in severe tropical cyclones is observed during the post-monsoon season (October–December). However, once formed, rate of intensification of TCs into severe TCs has increased during the recent years. It is evident from the significant increasing trends in the ratio of severe TCs to TCs frequency during all the seasons and the year as a whole during the period 1901–2010 over the NIO. Regarding the observed trends and low-frequency variability of TC activity, an important limitation is the fact that the observing system has changed throughout the years. A number of researchers attribute the reported increases as being due primarily to data reliability issues, in that the strong tropical cyclones are more accurately monitored in the recent years. Klotzbach (2006) restricted his analysis to the last 20 years when there were consistent satellite imagery and found no significant change in global net tropical cyclone activity and a small trend (~+10%) in category 4 and 5 frequencies. Kamahori et al. (2006) using the Japanese Meteorological Agency (JMA) typhoon database found that there was a substantial drop in the amount of category 4 and 5 typhoon activity between the periods 1977- 1990 and 1991-2004, which is in contrast to the Webster et al. (2005) study that utilized the Joint Typhoon Warning Center (JTWC) typhoon database. The resulting data inhomogeneity can lead to spurious trends and distort climate signals in the data. The attribution of recent observed trends to either anthropogenic or natural causes is still unclear. Please refer an important study by Klotzbach and Landsea (2015) which concludes: When restricted to the most recent 25 years (1990–2014) with the most reliable and homogeneous records, the following conclusions are reached from this analysis: • Small, insignificant decreasing trends are present in category 4–5 hurricane frequency in the Northern Hemisphere and globally, while there is no virtually no trend in Southern Hemisphere frequency. • Large, significant downward trends are present in accumulated cyclone energy in the Northern Hemisphere, the Southern Hemisphere, and globally. These results are more in line with expectations from climate models (Knutson et al. 2010, 2013; Camargo 2013; Christensen et al. 2013; Bender et al. 2010), which suggest that no appreciable change in category 4–5 hurricane numbers or percentages would be detectable at this time due to anthropogenic climate change. References: Klotzbach, P.J. and C.W. Landsea, 2015: Extremely Intense Hurricanes: Revisiting Webster et al. (2005) after 10 Years. J. Climate, 28, 7621–7629,https://doi.org/10.1175/JCLI-D-15-0188.1 Klotzbach, P. J., 2006: Trends in global tropical cyclone activity over the past twenty years (1986-2005), Geophys. Res. Lett., 33, L10805, DOI:10.1029/2006GL025881	Many thanks for these comments. The papers by Murakami et al. (2017), Klotzbach and Landsea (2015) and Klotzbach et al. (2016) are referenced in the revised report. The assessment has been carefully revised in acknowledgement of the fact that heterogeneity in the observational record limits the confidence in the observed trends detected.
61864	53	22	55	15	Please refer to AR5 as a starting point, then new literature (I have identified some papers currently not cited, and can provide them b email), then an assessment of existing evidence for 1.5°C-2°C with use of IPCC calibrated language. The last part of the section (page 55) provides nothing directly relevant for 1.5°C-2°C (is it needed?). [Valérie Masson-Delmotte, France]	The section has been somewhat restructured, starting with an overview of observed trends, followed by an overview of projected changes (generally) and subsequently specifically for 1.5 vs 2 degrees C of global warming. The text on changes in wind patterns has been removed since it didn't contain information specific to 1.5 vs 2 degrees C of global warming. A focussed discussion on projected changes in extra-tropical cyclones was added.
31480	53	24	53	24	As an example of typhoon activity change research, please add the following study: Yoshida, K., M. Sugi, R. Mizuta, H. Murakami, and M. Ishii, 2017: Future changes in tropical cyclone activity in high-resolution large-ensemble simulations, Geoph. Res.. Letters, doi: 10.1002/2017GL075058 [Japan]	Many thanks for the reference - findings from the paper by Yoshida et al. (2017) have been incorporated in the text.
39776	53	27	53	27	I relation to the satellite era, I suggest to replace "(the last three decades)" by "(almost the last four decades)". In the meteorological and climatic scientific literature it is often assumed that the beginning of the satellite was in 1979 (e.g. Rienecker et al. (2011). MERRA: NASA’s Modern-Era Retrospective Analysis for Research and Applications. J. Climate, 24, 3624–3648, https://doi.org/10.1175/JCLI-D-11-00015.1). [Hernan Edgardo Sala, Argentina]	Thank you for this suggestion. It is now indeed stated in the text that the detection of trends in tropical cyclones is largely limited to the almost four-decade long satellite era, and reference is made to the paper of Rienecker et al. (2011).
41348	53	30			There is no place for this statement in this para. [Lourdes Tibig, Philippines]	The statement on small island exposure has been removed, since this subsection indeed deals with changes in the physical climate system (in particular changes in tropical cyclone attributes) rather than with vulnerable areas impacted upon by tropical cyclones.
41350	53	30	53	49	Is there a confidence level in the finding that there is a poleward migration of tropical cyclone activity?What is the level of confidence, considering that there are not many papers on this? [Lourdes Tibig, Philippines]	Statements on the meridional displacements in tropical cyclones tracks have been removed from the text, partially because of the limited evidence available in support of such changes.
38402	53	30	53	37	The statement is misleading and gives the impression that tropical cyclones are migrating poleward away from the tropics and may eventually no longer be threat to parts of the tropics. [Bahamas]	Statements on the meridional displacements in tropical cyclones tracks have been removed from the text, partially because of the limited evidence available in support of such changes.
33570	53	31	53	37	It couldn’t be accurate to use the word migration to describe the average poleward expansion of tropical cyclone activity. The description using “migration” could reflect an incorrect idea of what is really happen. I suggest to change the word migration by expansion everywhere in the paragraph. The worse case is in line 35 where state the migration is away from the tropics. [Abel Centella, Cuba]	Statements on the meridional displacements in tropical cyclones tracks have been removed from the text, partially because of the limited evidence available in support of such changes.
121	53	32	53	32	decade(to be changed "decade (" [teodoro georgiadis, Italy]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
13332	53	32	53	37	Suggests tropical cyclones achieve maximum intensity at higher latitudes and also that there is a poleward migration from the tropics. However this statement is considered misleading and should clarified to be in line with what actually attains currently. [Grenada]	The statement on small island exposure has been removed, since this subsection indeed deals with changes in the physical climate system (in particular changes in tropical cyclone attributes) rather than with vulnerable areas impacted upon by tropical cyclones.
21848	53	32			insert space between "decade(Kossin" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
32164	53	32	53	37	Suggests tropical cyclones achieve maximum intensity at higher latitudes and also that there is a poleward migration from the tropics. However this statement is considered misleading and should clarified to be in line with what actually attains currently. [Jamaica]	The statement on small island exposure has been removed, since this subsection indeed deals with changes in the physical climate system (in particular changes in tropical cyclone attributes) rather than with vulnerable areas impacted upon by tropical cyclones.
39778	53	32	53	32	Insert space before the opening parenthesis in "...decade(Kossin..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44378	53	32	53	37	Space is missing in 2 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
54372	53	32	53	32	I would not call "pronounced" a shift of 50 km per decade. This is a small shift compared to the variability + confidence intervals should be given for the two numbers [Robert Vautard, France]	The statement on small island exposure has been removed, since this subsection indeed deals with changes in the physical climate system (in particular changes in tropical cyclone attributes) rather than with vulnerable areas impacted upon by tropical cyclones.
36452	53	32	53	37	Suggests tropical cyclones achieve maximum intensity at higher latitudes and also that there is a poleward migration from the tropics. However this statement is considered misleading and should clarified to be in line with what actually attains currently. [Snaliah Mahal, Saint Lucia]	The statement on small island exposure has been removed, since this subsection indeed deals with changes in the physical climate system (in particular changes in tropical cyclone attributes) rather than with vulnerable areas impacted upon by tropical cyclones.
57084	53	32			missing space "decade(Kossin" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
21850	53	34			What does it means "taking place at a rate of 53 (62) kilometers ..."? is it 53 or 62? [LUIS VALDES, Spain]	The statements around plausible meridional displacements in storm tracks in the observational record have been removed from the text given the limited evidence available.
57086	53	34			meaning "rate of 53 (62) kilometres" [AMANDINE PASTOR, France]	The statements around plausible meridional displacements in storm tracks in the observational record have been removed from the text given the limited evidence available.
32168	53	36			Comment on 'insufficient literature' contradicts (pg 60 - at least 6 papers were cited) [Jamaica]	It is not clear to which text this comment refers to
36456	53	36			Comment on 'insufficient literature' contradicts (pg 60 - at least 6 papers were cited) [Snaliah Mahal, Saint Lucia]	It is not clear to which text this comment refers to
122	53	37	53	37	.Migration to bechanged ". Migration" [teodoro georgiadis, Italy]	The statements around plausible meridional displacements in storm tracks in the observational record have been removed from the text given the limited evidence available.
9234	53	37			Please change "(Lucas et al., 2014).Migration" to "(Lucas et al., 2014). Migration" [Marco Turco, Spain]	The statements around plausible meridional displacements in storm tracks in the observational record have been removed from the text given the limited evidence available.
21852	53	37			insert space between "2014)migration" [LUIS VALDES, Spain]	The statements around plausible meridional displacements in storm tracks in the observational record have been removed from the text given the limited evidence available.
57088	53	37			missing space "(Lucas et al., 2014).Migration" [AMANDINE PASTOR, France]	The statements around plausible meridional displacements in storm tracks in the observational record have been removed from the text given the limited evidence available.
49168	53	41	53	45	Park et al. 2017 is a study using CMIP5 projections. Other statements in the paragraph are based on observations (to my knowledge) and results from GCM projections are discussed in the next paragraph. [Bill Hare, Germany]	Many thanks for this comment, which is correct. The study by Park et al. (2017) is no longer referenced in the discussion of observed trends.
36428	53	41	53	42	The statement "tropical cyclones will decrease in the North Atlantic" there is no citation given for this statment. [Snaliah Mahal, Saint Lucia]	This statement has been removed. It referred to projections for the North Atlantic rather than trends. An updated discussion of projections are now provided later in the section.
32476	53	47	53	47	Add "was" after "…tropical cyclones frequency" [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
17650	54	1	54	14	Suggest including the following two recent publications on tropical cyclone activity projections in this paragraph : 1. Knutson et al., 2015: Global Projections of Intense Tropical Cyclone Activity for the Late Twenty-First Century from Dynamical Downscaling of CMIP5/RCP4.5 Scenarios, J. of Climate, 28, 7203-7233. 2. Sugi et al., 2016 : Projection of future changes in the frequency of intense tropical cyclones, Climate Dynamics, 49 (1–2), 619–632. [Sai Ming Lee, China]	Both these references were useful to strengthen the text - thank you for suggesting these.
17652	54	1	54	36	Strongly suggest adding a paragraph to highlight the increasing risk of storm surge due to the expected increase of tropical cyclone intensity and sea level rise in the future. Suggested references : 1. Walsh, K. J. E., McBride, J. L., Klotzbach, P. J., Balachandran, S., Camargo, S. J., Holland, G., et al. (2016). Tropical cyclones and climate change. Wiley Interdisciplinary Reviews: Climate Change 7, 65–89. doi:10.1002/wcc.371. 2. Gao et al., 2014 : Risk assessment of tropical storm surges for coastal regions of China, DOI: 10.1002/2013JD021268 3. Lin and Emanuel, 2016 : Grey swan tropical cyclones, Nature Climate Change, 6, 106-111. 4. Tebaldi et al., 2012 : Modelling sea level rise impacts on storm surges along US coasts, Environ. Res. Lett. 7, 104032. 5. Hoshino et al., 2016 : Estimation of increase in storm surge damage due to climate change and sea level rise in the Greater Tokyo area, Nat. Hazards, 80, 539-565 [Sai Ming Lee, China]	We had to largely restrict the text to tropical cyclone attributes at 1.5 vs 2 degrees C of global warming. In the case of storm surges, none of the suggested references pursued this specific question and thus were not included in the Chapter.
41480	54	1	54	7	Here , Yoshida et al (2017) should be referred, because they evaluate the change of TC activity by using O(1000) years ensemble simulations, and found the same results as written here with much higher robustness. They evaluate by using 4 degree increase world of RCP8.5 scenario. (Yoshida, Sugi, Mizuta, Murakami, Ishii, 2017: Future changes in tropical cyclone activity in high-resolution larage-ensemble simulations, GRL, doi: 10.1002/2017GL075058) [Izuru Takayabu, Japan]	The paper by Yoshida et al. (2017) is now indeed being referred to in the text - many thanks for suggesting this reference.
17380	54	3	54	3	Replace "categories" with "category". [David Schoeman, Australia]	Accepted - Text was revised
49170	54	5	54	7	Recent studies are challenging the overall picture of a general decrease in TC frequency. An increase in TC frequency has been found by downscaling CMIP5 models and by using TC intensity models. 1) Emanuel K 2013 Downscaling CMIP5 climate models shows increased tropical cyclone activity over the 21st century 110 12219–24 and 2) Emanuel K 2017 A fast intensity simulator for tropical cyclone risk analysis Nat. Hazards 88 779–96 [Bill Hare, Germany]	The paper by Emanuel (2017) was included in the text, and the contradiction between its findings and the majority of GCM projections have been described in the text.
36430	54	7	54	8	There needs to at least examples given of the uncertainities associated with projected changes. [Snaliah Mahal, Saint Lucia]	Due to the concise nature of the SR1.5 text we have not dwelled into discussing the projected changes in tropical cyclone attributes for different ocean basins.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53684	54	7	54	7	This sentence can be added here "On the other hand, vulnerability of cyclone damage has been projected about ?50 % in 2070 over 2015 (gettelman et al. 2017)" ; doi:10.1007/s10584-017-1902-7 [AKM SAIFUL ISLAM, Bangladesh]	This reference and statement were not included in the Chapter 3 text, because it is not directly relevant to the main narrative, namely to explore different impacts at 1.5 vs 2 degrees C of global warming.
41352	54	9	54	15	Level of confidence in this assessment (based on 3 papers?) [Lourdes Tibig, Philippines]	Confidence levels have been assigned to this subsection in the revised version of Chapter 3 (please see the text for details). In summary, the assessment is that heavy precipitation associated with tropical cyclones is likely to increase under increasing global warming.
46686	54	9	54	9	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been carefully rephrased and is now fully consistent with formal IPCC uncertainty language.
56634	54	9	54	14	This is the only place where the event attribution literature is mentioned and it is used here as major evidence to infer future changes. For all other types of impacts there is a substantial literature from event attribution. I would strongly recommend to add a paragraph like this to all types of impacts discussed in this chapter based on the attribution literature. An overview of avalaible studies that is relatively recent can be found here. https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world [Friederike Otto, United Kingdom (of Great Britain and Northern Ireland)]	Thank your for the comment. We have indeed in Section 3.3 of Chapter 3 strived to start each sub-section with a discussion of observed trends, followed with some analysis of the extent to which observed trends can be attributed to climate change - to the extent that this could be supported by peer-reviewed literature. Overall, the final version of Chapter 3 deals in particular with attribution in terms of regional temperatures and extremes, regional precipitation, drought and floods.
46688	54	11	54	11	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been carefully rephrased and is now fully consistent with formal IPCC uncertainty language.
524	54	12	54	12	See also Emanuel, K. (2017). Assessing the present and future probability of Hurricane Harvey's rainfall. Proceedings of the National Academy of Sciences, 201716222. [Robert Koppu, United States of America]	We have found this paper not to be directly relevant to differentiate between impacts at 1.5 vs 2 degrees C of global warming.
1802	54	13	54	14	This can be inferred under the assumption of linear dynamics. [Greece]	This assumption is now clearly stated in the text - thank you for the recommendation.
31482	54	14	54	14	We can find an increase of storm surge height of about 20% with the anthropogenic temperature change of about 0.85°C from the pre-industrial age, for the case of super typhoon Haiyan in the Philippine sea: Takayabu I., K. Hibino, H. Sasaki, H. Shiogama, N. Mori, Y. Shibutani, and T. Takemi, (2015). Climate change effects on the worst-case storm surge: a case study of Typhoon Haiyan. Environ, Res. Lett., 10 064011. doi:10.1088/1748-9326/10/6/064011. [Japan]	Many thanks for the reference, however, we did not find sufficient literature to attempt exploring differences in storm surges at 1.5 degrees C vs 2 degrees C of global warming.
1804	54	17	54	36	It is not fully clear from this paragraph whether a decrease, an increase or a stabilization in the total number, frequency, and intensity of cyclones in different regions is projected. More synthesis and clear language is needed in presenting the findings from different studies. [Greece]	Clear-cut confidence statements have been developed for changes in the global attributes of tropical cyclones (see the revised Chapter). However, given the concise nature of SR1.5, detailed analysis across different ocean basins has not been attempted and most of the SOD text about changes for different ocean basins has been removed from the text.
6048	54	17	54	17	The models don't have difficulty - they aren't trying to do this! They probably don't exhibit skill, or maybe cannot properly resolve these attributes.. [Timothy Carter, Finland]	This statement has been removed from the text.
41354	54	17	54	36	Where is the assessment/ This appears to be just a review. [Lourdes Tibig, Philippines]	The revised provides an assessment of observed and projected changes in tropical cyclone attributes with confidence statements that are provided in formal IPCC form.
46690	54	17	54	17	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been carefully rephrased and is now fully consistent with formal IPCC uncertainty language.
41482	54	17	54	36	To evaluate the details of the disaster caused by TC, the approach of pseido global warming downscaling (PGWD) is a valuable one. However we cannot find any such appoach here in this chapter. For story telling approach of event attribution (EA), we have Lackmann (2015) for Hurricane Sandy, or Takayabu et al (2015) for Typhoon Haiyan, two example of super TCs which caused heavy disasters. There some of the disaster should be caused by the climate change. Also, some researches have been done to clarify the effect of futurer climate change to the increase of the disaster for the present super TCs. This approach has been done for Hurricane Sandy (Lackmann, 2015), for Typhoon Vera (Kanada et al, 2017), and Typhoon Chanthu (Kanada et al, 2017). These papers have indicated an acceleration of the TC's development in the future climate conditions (Lackmann, 2015: Hurricane Sandy before 1900 and after 2100, BAMS, doi: 10.1175/BAMS-D-14-00123.1, Takayabu, Hibino, Sasaki, Shiogama, Mori, Shibutani, Takemi, 2015: Climate change effects on the worst-case storm surge: a case study of Typhoon Haiyan, Environ. Res. Lett. 10 064011, doi:10.1088/1748-9326/10/6/064011, Kanada, Takemi, Kato, Yamasaki, Fudeyasu, Tsuboki, Arakawa, Takayabu, 2017: A multimodel intercomparison of an intense typhoon in future, warmer climates by four 5-km-mesh models, Journal of Climate, doi: 10.1175/JCLI-D-16-0715.1, Kanada, Tsuboki, Aiki, Tsujino, Takaybu, 2017: Future enhancement of heavy rainfall events associated with a typhoon in the midlatitude regions, SOLA, doi:10.2151/sola.2017-045) [Izuru Takayabu, Japan]	Thank you for the comment. From this set of related investigations, we have selected to reference Risser and Wehner (2017) and Van Oldenborgh et al. (2017). Both these studies analyse how precipitation in Hurricane Harvey may have been made more intense as a consequence of anthropogenic forcing. However, overall the section is focussed on distinguishing between tropical cyclones attributes between 1.5 vs 2 degrees C of global warming.
17382	54	18	54	19	Awkward wording, revise [David Schoeman, Australia]	Accepted - Text was revised
21854	54	18			Two citations are needed in support of "Only two studies..." [LUIS VALDES, Spain]	These two papers are referenced in the subsequent text: Wehner et al. (2017) and Muthige (2018). In previous draft Muthige was by mistake referred to as Mavhungu.
29350	54	21	54	22	There is the full meaning of the HAPPI acronym explained. But this acronym already appeared 10-20 times before this one. I would suggest to move the full project title to the first appearance. [Borbala Galos, Hungary]	Accepted - only acronym is included now
1394	54	25			Shouldn't it be 1.5°C instead of 1°C? [Karen Olsen, Denmark]	Correct - 1 degrees C was changed to 1.5 degrees C.
3552	54	25			Replace '1' by '1.5'. [David Docquier, Belgium]	Correct - 1 degrees C was changed to 1.5 degrees C.
6210	54	25			Shouldn't it be 1.5°C instead of 1°C? [Anne Olhoff, Denmark]	Correct - 1 degrees C was changed to 1.5 degrees C.
18300	54	25			Shouldn't it be 1.5°C instead of 1°C? [Andrea TILCHE, Belgium]	Correct - 1 degrees C was changed to 1.5 degrees C.
28298	54	25	54	25	Please change 1.0°C into 1.5°C. [Germany]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35916	54	28	54	36	The accumulated cyclonic energy is projected to increase globally and consistently so for the North Atlantic, northwestern Pacific and northeastern Pacific Oceans, but with slight decreases projected for the South Pacific, northern Indian and southern Indian Oceans (Wehner et al., 2017) However some other studies suggests increased cyclonic activity in the Indian ocean (https://journals.ametsoc.org/doi/full/10.1175/JCLI-D-16-0553.1). Lot of references to Mavhungu et al., which is an unpublished work. Rajeevan et al (2013) also suggest that During recent years, an increase in the intensity of pre-monsoon tropical cyclones (TCs) is observed over the Arabian Sea. This study suggests that this increase is due to epochal variability in the intensity of Tropical Cyclones and is associated with epochal variability in the storm-ambient vertical wind shear and tropical cyclone heat potential (TCHP) We suggest that these reference may also be included to inform this conclusion. [References: M. Rajeevan, J. Srinivasan, K. Niranjan Kumar,C. Gnanaseelan and M. M. Ali, On the epochal variation of intensity of tropical cyclones in the Arabian Sea, Atmospheric Science Letters,2013.] [India]	In previous draft Muthige was by mistake referred to as Mavhungu. The paper by Muthige et al. (2018) has been published in ERL. We have not dwelled into detail in changes projected at ocean basin scale, largely because of the concise nature of SR1.5 - the exception is the very few studies that are specifically dealing with impacts at 1.5 vs 2 degrees C of global warming.
1014	54	29	54	29	Lot of references to Mavhungu et al. here and elsewhere, which is an unpublished work – appears to be self-citation by one of the IPCC co-authors. I went through the unpublished manuscript and the results appear to be preliminary and inconclusive. I suggest dropping all references to this unpublished study. [Roxy Mathew KOLL, India]	In previous draft Muthige was by mistake referred to as Mavhungu. The paper by Muthige et al. (2018) has been published in ERL.
7812	54	29			Mavhungu et al, what year? [Anthony Lupo, United States of America]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
21856	54	29			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
32478	54	29	54	29	Mavhungu et al., citation missing the year. [Rosanne Martyr-Koller, Germany]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
35918	54	29			Reference to Mavhungu et al., is an unpublished work. [India]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
40242	54	29	54	29	the year of the reference"(Mavhungu et al.)" was missed. [Amal Hussein, Egypt]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
44380	54	29	54	36	Year is missing "(Mavhungu et al.)" [Rita Man Sze Yu, China]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
56316	54	29	54	29	Remove parentheses around reference. [Annika Herbert, Australia]	Accepted - Reference was revised
36432	54	31	54	31	Only one paper was citited for the impacts listed, and this would not suffice for evidence. [Snaliah Mahal, Saint Lucia]	Low confidence has been assigned to the relevant statements.
54374	54	32	54	34	How robust is this statement and how confident can we be? [Robert Vautard, France]	Low confidence - please see the revised text.
10746	54	33	54	33	Change to 'under 2°C of global warming…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
21858	54	33			It should be "of" instead of "f" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
29456	54	33	54	33	Please substitute "f global warming" with "of global warming". [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised with the suggested edit
32480	54	33	54	33	Spelling: "of" instead of "f" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
35104	54	33	54	33	There is an extra letter "f" in the line. [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
35920	54	33	54	33	Remove 'f' [India]	Accepted - Text was revised with the suggested edit
44382	54	33	54	33	under 2°C f global warming [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
44958	54	33	54	33	under 2oC f' --> 'under 2oC of' [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
56784	54	33	54	33	why there is a "f" after 2^oC? [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
294	54	36	54	36	....(Manhungu et al., submitted) ????? [Paul Doyle, Canada]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text as the paper has been published.
12878	54	36			The reference to Mavhungu et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
21860	54	36			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
32482	54	36	54	36	See Comment 13 [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
39780	54	36	54	36	Add "submitted" to "Mavhungu et al.". [Hernan Edgardo Sala, Argentina]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text as the paper has been published.
50934	54	36	54	36	year of publication is missing in reference in "Mavhungu et al." [Amjad Masood, Pakistan]	In previous draft Muthige was by mistake referred to as Mavhungu. Year (2018) has been added to text.
1806	54	38	54	47	What about the difference between 1.5 oC and 2 oC in Europe? Does the point in page 55 lines 14-15 (lack of comparisons) apply to all regions? [Greece]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
12040	54	38	55	15	This section could be drastically shortened - doesn't really relate to 1.5°C and is very descriptive. E.g. "Little research exists analysing differences in oceanic sea-surface winds between 1.5 and 2°C of warming. However, changes in winds may increase storm surge levels by up to 30% above relative sea-level rise along the European coast (Vousdoukas et al., 2016)." [United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
29458	54	38	54	47	There's no mention to "global stilling" wind phenomenon. Please review some references already listed in chapter 3 as Vautard et al. (2010) and McVicar et al. (2012). [Joan A. Lopez-Bustins, Spain]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
41356	54	38	54	47	This long para can be shortened ; it is the findings that are important. [Lourdes Tibig, Philippines]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
10406	54	39	54	41	you could add here "forests" and cite Seidl et al. 2017. Seidl R, D Thom, M K, D Martin-Benito, M Peltoniemi, G Vacchiano, J Wild, D Ascoli, M Petr, J Honkaniemi, MJ Lexer, V Trotsiuk, P Mairota, M Svoboda, M Fabrika, TA Nagel, CPO Reyer (2017) Forest disturbances under climate change. Nature Climate Change 7:395–402 DOI 10.1038/nclimate3303 [Christopher Reyer, Germany]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
17384	54	45	54	45	Replace "show" with "shows". [David Schoeman, Australia]	Not applicable - This section was rewritten
31666	54	49	55	15	Sec 3.3.7 final paragraph. This paragraph is poorly written and is identical to the FOD draft version. I raised a number of comments with the aim being to improve it in the previous review and these have not been addressed. I repeat these comments below, together with several new more general comments, please address them since at present this paragraph does not meet the standard expected for IPCC. This may be due to a lack of ocean expeience amongst the authors, if this is the problem please seek expert input from an oceanographer. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
31668	54	49	55	15	Sec 3.3.7 and elsewhere (3.3.8). More account needs to be taken of the AR5 reports. In particular, where conclusions reached in SR1.5 are demonstrably different from AR5 this needs to be noted and an explanation given why the new conclusion has been reached. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text (section 3.3.7 of the SOD), largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones. In section 3.3.8, clear reference is made in terms of the AR5 findings, in particular for AMOC.
31670	54	49	55	15	Sec 3.3.7 final paragraph. A comprehensive assessment of wind speed trends, using 10 different datasets, was carried out for IPCC AR5 see WG1 Ch.2 Sec 2.7.3 (in particular Fig.2.38). The period considered was 1988-2010 and the conclusion reached was that 'In summary, confidence is low in changes in surface wind speed over the land and over the oceans owing to remaining uncertainties in datasets and measures used'. However, in SR1.5 Sec 3.3.7 final para the leading conclusion is that '...global oceanic sea-surface wind speeds increased at a significant overall rate of 3.35 cm s?1 yr?1 for the period 1988–2011 and that only a few regions exhibited decreasing wind speeds without significant variation over this period.' This new conclusion is based on a single dataset (one of the ten employed in AR5 WG1 Ch2) for a virtually identical period to that considered in AR5 i.e.1988-2011 as opposed to 1988-2010. Hence, there is a major difference in conclusions on this point reached by AR5 WG1 Ch.2 and SR1.5 Sec 3.3.7. Can the authors please resolve this difference and state how they can robustly conclude that wind speed is increasing in most regions using one dataset when the more complete AR5 analysis concluded that there was low confidence in surface wind speed changes? [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
31680	54	49	55	15	The Southern Oceans are an obvious omission from the discussion in this section. So, an extra couple of sentences are needed on S Ocean wind trends. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
31672	54	49	55	5	The conclusion of increasing wind speed reached here relies on the analysis of CCMP data for 1988-2011 by Zheng et al. (2016). However, the global map of wind speed trends in Zheng et al. (2016) Fig.2. has a very different structure to that shown in WG1 Ch.2 Fig.2.38 for an almost identical period. If the authors are going to use the Zheng et al. (2016) results they need to explain why they look so different to those published in AR5. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
41358	54	49	55	15	transform the reviewinto an assessment and use calibrated language, please. [Lourdes Tibig, Philippines]	The revised section provides a clear assessment of changing tropical cyclone attributes, including confidence statements and the use of probability language.
28300	55	1	55	1	SI unit m/s should be used instead of cm/s; please adjust number of valid digits. [Germany]	Not applicable - text has been revised
41590	55	1			The unit cm s-1.yr-1 is not usual for wind speed. [Czech Republic]	Accepted - text has been revised
17386	55	3	55	3	Replace "region" with "regions" and "speeds" with "speed" [David Schoeman, Australia]	Not applicable - This section was rewritten
56318	55	3	55	3	Change "region" to "regions". [Annika Herbert, Australia]	Not applicable - This section was rewritten
31674	55	5	55	6	This is confirmed by Ma et al. (2016) who showed that the surface wind speed has not decreased in the averaged tropical oceans.' Need to clarify what is confirmed here. The previous sentence talks about regional variations whereas the current one notes 'averaged tropical oceans'. So, what is being confirmed? [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming have been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
31676	55	5	55	6	This is confirmed by Ma et al. (2016) who showed that the surface wind speed has not decreased in the averaged tropical oceans.' Presumably this means eitrher that the surface wind speed has either increased or not changed significantly. Please clarify which of these applies rather than using the term 'not decreased'. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
31678	55	5	55	6	This is confirmed by Ma et al. (2016) who showed that the surface wind speed has not decreased in the averaged tropical oceans.' What period is being refeered to here and is it the same as the 1988-2011 period cited for the Zheng study? [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
31682	55	6	55	6	Liu et '16 in refs refers to Tibetan phenology so the wind reference is still missing. It needs to be added to the reference list. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39782	55	6	55	6	It seems that the paper Liu et al. (2016) has not been properly cited or not included in the References section of this chapter. Please, check if the correct citation is: Liu, Q., A.V. Babanin, S. Zieger, I.R. Young, and C. Guan, 2016: Wind and Wave Climate in the Arctic Ocean as Observed by Altimeters. Journal of Climate, 29, 7957–7975. https://doi.org/10.1175/JCLI-D-16-0219.1 [Hernan Edgardo Sala, Argentina]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
49438	55	6	55	15	The part on the Arctic waves is not balances with the previous part of the paragraph. It is too specific and over-detailed. In addition, consider to add estimates from (Khon et al., 2014, doi: 10.1002/2014GL059847) to increase the robustness of conclusions. [Alexander Chernokulsky, Russian Federation]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
17388	55	9	55	15	Waves don't change, but their heights can; winds don't increase, but their speeds can. [David Schoeman, Australia]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming have been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
56320	55	10	55	10	Remove "the", so that it reads "northern Alaska)". [Annika Herbert, Australia]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming have been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
32484	55	13	55	15	Studies addressing the difference between 1.5 and 2C scenarios don't exist. On what? Specifically winds+waves? If so, please state that explicitly, ie "Studies addressing the difference between 1.5 ad 2C scenarios on wind-waves do not exist.". [Rosanne Martyr-Koller, Germany]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
1396	55	14		15	Given the space limitations, that's pretty much all that should be said about this [Karen Olsen, Denmark]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming have been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
6212	55	14		15	Given the space limitations, that's pretty much all that should be said about this [Anne Olhoff, Denmark]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming have been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
18302	55	14		15	This section should concentrate on what can be deduced about the impacts of 1.5°C & 2°C warming given the available evidence, and then state the wider scientific context more briefly. [Andrea TILCHE, Belgium]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming have been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
49882	55	14	55	15	Kjellström et al 2017 (https://www.earth-syst-dynam-discuss.net/esd-2017-104/esd-2017-104.pdf) look at seasonal mean changes in wind speed at 1.5 and 2C for Europé [Erik Kjellström, Sweden]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
17390	55	15	55	15	Avoid contractions [David Schoeman, Australia]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
44384	55	15	55	15	scenarios do not exist [Rita Man Sze Yu, China]	The analysis of changes in wind patterns globally under 1.5 vs 2 degrees C of global warming has been removed from the text, largely due to the lack of evidence available. The final version of the section discussed only changes in tropical cyclones and extra-tropical cyclones.
5600	55	18	55	18	in my opinion the section 3.3.8 should come before than the section 3.3.7….. [Sandra CASSOTTA, Denmark]	We have decided to retain the current order of sections, with the logic being moving from atmospheric aspects to ocean aspects.
13868	55	18	55	20	Please explain reasoning why the temperature changes are from 0-700m only. Is it based on numerical model/data assimilation or observations? Global Argo data are available since 2004 and have temperature, density, and salinity data up to 2000m. [Raden Dwi SUSANTO, United States of America]	AR5 discussed trends in the upper 700 m of the ocean, and SR1.5 builds on that in terms of assessing post-AR5 literature.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
13870	55	18	56	9	Given the importance of SST on the average of temperature 1.5C, the report should mention about the important of trans-basin variability that carry/distribute mass and heat between oceans (Global Ocean Conveyer Belt): from Pacific to Indian Ocean known as Indonesian throughflow (see i.e. Sprintall et al., 2014; Susanto et al., 2012; Susanto and Song, 2015); from the Indian to Atlantic via Agulhas Current (i.e., Beal and Elpicot, 2016, Ridderinkhof et al., 2010), and AMOC, and the southern ocean circulation. Beal, L. and S. Elipot, 2016: Broadening not strengthening of the Agulhas Current since the early 1990s. Nature, 540 (7634), 570-+, doi:10.1038/nature19853. Ridderinkhof, H., et al., 2010: Seasonal and interannual variability in the Mozambique Channel from moored current observations. Journal of Geophysical Research-Oceans, 115, doi:10.1029/2009JC005619. Susanto, R., A. Ffield, A. Gordon and T. Adi, 2012: Variability of Indonesian throughflow within Makassar Strait, 2004-2009. Journal of Geophysical Research-Oceans, 117, doi:10.1029/2012JC008096. Susanto, R. and Y. Song, 2015: Indonesian throughflow proxy from satellite altimeters and gravimeters. Journal of Geophysical Research-Oceans, 120 (4), 2844-2855, doi:10.1002/2014JC010382. Sprintall, J., A. L. Gordon, A. Koch-Larrouy, T. Lee, J. T. Potemra, K. Pujiana, and S. Wijffels , 2014: The Indonesian Seas and their role in the coupled ocean-climate system, Nature Geosci., 7, 487–492. http://dx.doi.org/10.1038/ngeo2188. [Raden Dwi SUSANTO, United States of America]	Many thanks for these references, which are likely to find impact in the SROCC. Here the analysis is largely restricted to impacts on ocean circulation under 1.5 vs 2 degrees C of global warming.
50290	55	18	56	9	General comment to section 3.3.8: There is a huge issue with this section. More or less no assessment approach had been applied, and wrong and strong statements are given, most of them almost not underminded by any reference, or through publications with are referenced with even no title. I strongly recommend to add a contributing author to this chapter to support the draft development of this section, and other ocean section in this chapter - maybe even someone who had been already assigned for AR6. More precised comments on this section are given below. [Karina VON SCHUCKMANN, France]	The section has been revised since the SOD, and uncertainty language and confidence statements were added.
54376	55	18	55	18	Ocean circulation is discussed but changes in atmospheric general circulation and teleconnexions is not, this is a missing part [Robert Vautard, France]	Changes in atmospheric circulation is discussed in various sections, for example changes in the monsoon circulation is discussed in section 3.3.3.2, and changes in storm tracks are discussed in 3.3.6. It should otherwise be noted that SR1.5 is mostly focused on climate impacts under 1.5 vs 2 degrees C of global warming, and with this scope in mind it can not provide a full assessment of the physical science base as in AR5 - this larger assessment is left to be undertaken in AR6.
1022	55	20	55	24	Cheng et al. (2017) provides improved estimates of ocean heat content for the global ocean basins. Cheng, L., Trenberth, K. E., Fasullo, J., Boyer, T., Abraham, J., & Zhu, J. (2017). Improved estimates of ocean heat content from 1960 to 2015. Science Advances, 3(3), e1601545. [Roxy Mathew KOLL, India]	Many thanks for the reference. However, the aim of this section is to investigate differential impacts on ocean circulation and physics under 1.5 vs 2 degrees C of global warming. SROCC will provide a more comprehensive update of ocean physics and circulation in general, including trends and projections, as a prelude to AR6.
1398	55	20		31	This is the right level of detail - good! [Karen Olsen, Denmark]	Thanks.
6214	55	20		31	This is the right level of detail - good! [Anne Olhoff, Denmark]	Thanks.
17818	55	20	55	49	The content in this subsection is lack of describing the changes in ocean circulation and temperature due to the 1.5C warmer world compared to other climate elements. The oceanic regional temperature changes as well as oceanic regional circulations (i.e., western boundary current & eastern boundary current) should be mentioned. In addition, there is no explanation about the changes in ocean temperature variability (i.e., ENSO) in the 1.5C or 2.0C warmer world. [Republic of Korea]	See section 3.5.2, RFC5, for a discussion of ENSO under 1.5 and 2 degrees C levels of global warming. The section does discuss eastern boundary currents and AMOC under 1.5 vs 2 degrees C of warming. It should be noted that information on impacts on ocean circulation under 1.5 vs 2 degrees C is limited, and this limits the scope of the Assessment. Moreover, the SROCC is to provide a much more comprehensive analysis of climate change and the oceans towards AR6.
35922	55	20	55	24	Add Cheng et al. (2017) which provides improved estimates of ocean heat content for the global ocean basins. [India]	Many thanks for the reference. However, the aim of this section is to investigate differential impacts on ocean circulation and physics under 1.5 vs 2 degrees C of global warming. SROCC will provide a more comprehensive update of ocean physics and circulation in general, including trends and projections, as a prelude to AR6.
61866	55	20	56	9	Please refer to the AR5 WGI report. I again object to the statement related to lines 1-5 of page 56. It is not consistent with the AR5 WGI finding, or with the outcomes of the RAPID measurements. Please quote for instance McCarthy et al 2017 showing AMOC slow down since the mid 2000s (very short period, with a sharp drop in 2009-2010 and stable values since that time). Please refer to AMOC (not thermohaline circulation) and do not speculate ("serious implications...). What is the level of scientific knowledge related to AMOC for 1.5°C or 2°C warming : is there any new assessment of the state of knowledge since the AR5? This could be harmonised with the box on "tipping points". [Valérie Masson-Delmotte, France]	Accepted. The statement around "serious implications" and the reference to the "thermohaline circulation" have both been removed. There is now only a statement around AMOC, which has been toned down relative to the original statement around the thermohaline circulation. The text now reads that "it is more likely than not that the Atlantic Meridional Overturning Circulation (AMOC) has been weakening in recent decades". The revised text states clearly that there is no literature available on AMOC under 1.5 vs 2 degrees C of warming. The box on tipping points has been removed, to avoid repetition with sections 3.3, 3.5.2.5 and 3.5.5. The study by McCarthy et al. (2017) is based on a far too short period to be regarded as a valid trend analysis.
17392	55	21	55	21	Replace "surface" with "surfaces". [David Schoeman, Australia]	Thank you for pointing out this typo.
60372	55	25	55	28	Long-term patterns of variability make detecting signals due to climate change complex may be valid for the ocean surface temperature, but for the 0-700m range being discussed in this paragraph, the global and basin decadal and longer-term warming signals would be very detectible, but the historically sparse temporal and spatial coverage of our routine oceanic observing system is the greater challenge. [United States of America]	The main point we are making here, is that decadal to multi-decadal variability in the ocean complicates the identification of systematic trends.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35288	55	26	55	27	A recent study looks relevant for this sentence. Applying an isotherm approach to CMIP5 multi-models, Weller et al. (2016) identified anthropogenic influences on the upper ocean warming on global and basin scales. Weller, E., S.-K. Min, M. Palmer, D. Lee, B. Y. Yim, and S.-W. Yeh, 2016: Multi-model attribution of upper-ocean temperature changes using an isothermal approach. Sci. Rep., 6, 26926, doi:10.1038/srep26926. [Seung-Ki Min, Republic of Korea]	Many thanks for the comment and reference. However, our focus here is largely on reporting on changes in ocean circulation under 1.5 vs 2 degrees C of warming, and attribution statements are largely left for the SROCC.
35290	55	27	55	29	If "extremes in the ocean" include ocean surface wave heights, a recent study of Kumar et al. (2016) looks relevant here. They examined ENSO, NAO, and PDO influences on extreme ocean wave heights over the globe using two reanalyses, and found overall the respone patterns of extreme wave heights to the internal climate variability resemble those of seasaon mean. Kumar, P. S.-K. Min, E. Weller, H. Lee, and X. L. Wang, 2016: Influence of climate variability on extreme ocean surface wave heights assessed from ERA-Interim and ERA-20C reanalyses. J. Climate, 29, 4031-4046. [Seung-Ki Min, Republic of Korea]	Many thanks for the reference, however, a discussion of ocean surface weight heights falls beyond the scope of SR1.5 and will be discussed in the SROCC.
50292	55	27	55	30	The link given here from general rise of ocean temperaure to more intense patterns of climate variability - and then even more precised to an intensitifation on ENSO): To my knowledge there is no consesus achieved on these interlinkages. At least a reference (or several for an assessment approach) should be given here, or this strong link cannot remain here. [Karina VON SCHUCKMANN, France]	Section 3.3.6 and Section 3.5.2 (RFC5) summarises the evidence for the intensification of ENSO and storms impacting on coasts under global warming.
16090	55	29	55	29	climate change intensification of ENSO Not clear to me how well suported this statement is either in observational data or in model outputs. Needs better support. [Australia]	Section 3.5.2 (RFC5) summarises the evidence for the intensification of ENSO under global warming.
31686	55	29	55	30	Increased heat in the upper layers of the ocean is also driving more intense storms'. The reference that forms the basis for this statement needs to be included. To my knowledge this point has not been conclusively shown in the literature. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	Section 3.3.6 summarises the evidence for the intensification of storms impacting on coasts under global warming.
41360	55	29	55	48	There is a confusion here of the assessment of trends and impacts. [Lourdes Tibig, Philippines]	The section has been revised and focuses largely on observed trends and projected changes.
53114	55	30	55	31	Such as Hurricane Harvey that hit Texas and Hurricane Maria that hit Puerto Rico in the summer and fall of 2017, respectively. [Thian Gan, Canada]	Noted - section 3.3.6 is relevant in this regard.
7874	55	33	55	48	Land-ocean temperature gradients are not direct drivers for upwellings, so it is no clear why the increase of the former should result in the increase of the latter. [Petr Zavialov, Russian Federation]	Land-ocean temperature gradients contribute to the strength of the longshore wind component, indirectly through the Coriolis effect.
13882	55	33	55	35	Upwelling variability is due along shore wind variability, the stronger the wind, the stronger upwelling. [Raden Dwi SUSANTO, United States of America]	The section states that a general strengthening in longshore winds can be detected, but less certainty exists about a corresponding detection of a strengthening in upwelling.
17394	55	33	55	48	The word is "upwelling", not "up-welling" or "up welling". If you disagree, at least pick just one. Please check throughout. [David Schoeman, Australia]	Accepted - Text was consistently revised into ´upwelling´
46020	55	38	55	40	Here the entire discussion about the credibility of GCM to simulate upwelling is missing: See Zuidema, P., et al. 2011 Joint edition of the newsletter of the Climate Variability and Predictability Project (CLIVAR) exchanges and the CLIVAR variability of the American Monsoon System Project (VAMOS), 55, 12 - 14. [Tim Rixen, Germany]	The discussion in the section is qualitative, referring to GCM projected changes in large-scale wind patterns and longshore winds, rather than to the ability of GCMs to explicitly simulate upwelling.
16092	55	41	55	41	evidence from regional climate modelling is supportive of an increase rewrite as "outputs from regional climate modelling is consistent with an increase" [Australia]	Rejected. "Evidence in support of…" is standard language.
17396	55	42	55	42	Winds don't decrease, but their frequency or speed can… [David Schoeman, Australia]	Rejected. The meaning of "decreasing longshore winds" is clear.
7872	55	43	55	48	Year is missing in the citation of Engelbrecht. [Petr Zavialov, Russian Federation]	Accepted - Reference was revised
13884	55	44	55	46	Upwelling variability is due along shore wind variability. Please analyze the wind change based on the 1.5C and 2C to check the impact on the global upwelling variability rather than land-temperature gradient. [Raden Dwi SUSANTO, United States of America]	Our assessment is restricted to peer-reviewed literature, and there were no studies available directly analysing changes in the longshore winds under 1.5 vs 2 degrees C of global warming.
16094	55	44	55	44	Check for correct citation: “Engelbrecht; Engelbrecht et al., 2009).”. [Australia]	Accepted - Reference was revised
62396	55	44	55	44	Please verify this reference "Engelbrecht;"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was revised
28302	55	45	55	45	Please define land-sea temperature gradients. [Germany]	Rejected. This by definition refers to the difference between land and sea temperatures, over space.
7570	55	48	55	48	...studies (Engelbrecht)…. publications year missing [Jens Zinke, Germany]	Accepted - Reference was revised
16096	55	48	55	48	Check for correct citation: “studies (Engelbrecht).” [Australia]	Accepted - Reference was revised
21862	55	48			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was revised
39784	55	48	55	48	The year of publication is missing in "(Engelbrecht)" [Hernan Edgardo Sala, Argentina]	Accepted - Reference was revised
44386	55	48	55	48	Year is missing "(Engelbrecht)" [Rita Man Sze Yu, China]	Accepted - Reference was revised
50294	55	48	55	48	How is it possible to cite a reference with no title, no year, and in preperation in the IPCC process? And where is the assessment approach of the whole paragraph? Rediscussions are needed, and as recommended above, with an additional expert. [Karina VON SCHUCKMANN, France]	The section has been revised since the SOD, and uncertainty language and confidence statements were added.
62398	55	48	55	48	Please verify this reference "Engelbrecht;"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was revised
3726	56	1	56	4	Alternatively, higher SST are being described at mid-latitudes. Likely this will also have an effect on the coastal productivity (and precipitation patterns) on mid-latitude areas at the eastern atlantic margin. (3.5.2.2.3 Droughts) [Castor Muñoz Sobrino, Spain]	See section 3.4 for a discussion of climate impacts on ocean and coastal productivity, here the focus is on impacts on ocean circulation and temperature.
28304	56	1	56	9	The message on ocean circulation not considered in the ES. Please add: "Evidence that thermohaline circulation is slowing has been building over the past years, including the detection of the cooling of surface waters in the north Atlantic plus strong evidence that the Gulf Stream has slowed by 30% since the late 1950s. These changes have serious implications for the reduced movement of heat to many higher latitude countries." and the relation to 1.5C/2C. [Germany]	Given limited evidence and low confidence in our assessment of AMOC, this statement was not included in the ES.
31688	56	1	56	3	Evidence that thermohaline circulation is slowing has been building over the past years, including the detection of the cooling of surface waters in the north Atlantic plus strong evidence that the Gulf Stream has slowed by 30% since the late 1950s.' These assertions need to be supported by references. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The statement around the thermohaline circulation weakening has been replaced by a toned-down and more specific statement on AMOC: "It is more likely than not that the Atlantic Meridional Overturning Circulation (AMOC) has been weakening in recent decades". The revised text includes the relevant references.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
31690	56	1	56	3	The assertion here in the SOD that the thermohaline circulation is slowing contradicts the conclusion reached in AR5 that there is no evidence for a long term trend. For example, see AR5 WG1 TS p.40 sentence2 'Based on measurements of the full Atlantic Meridional Overturning Circulation (AMOC) and its individual components at various latitudes and different time periods, there is no evidence of a long-term trend.' Hence, there is a major difference in conclusions on this point reached by AR5 WG1 and SR1.5 SOD. So, can the authors please resolve this difference and state how they are now able to robustly conclude that the thermohaline circulation is slowing? [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	The statement around the thermohaline circulation weakening has been replaced by a toned-down and more specific statement on AMOC: "It is more likely than not that the Atlantic Meridional Overturning Circulation (AMOC) has been weakening in recent decades". The revised text includes the relevant references, which constitute new post-AR5 sets of evidence.
34752	56	1	56	4	I have three suggestions regarding these lines: 1) It is more common to refer to the "thermohaline circulation" as the Atlantic Meridional Overturning Circulation, since the latter has a clear mathematical definition and is directly measured at 26°N via the RAPID array and now in the subpolar North Atlantic by the OSNAP program. Moreover, AMOC is used on page 60 and 68, and it would be best to be consistent throughout the document. 2) The cited literature is not sufficient to support the following statement, "Evidence that thermohaline circulation is slowing has been building over the past years, including the detection of the cooling of surface waters in the north Atlantic plus strong evidence that the Gulf Stream has slowed by 30% since the late 1950s." The 30% number comes from the Bryden et al., (2005) analysis of only 5 hydrographic sections over 50 years, which very likely serious aliased higher frequency fluctuations. The Rahmstorf et al. (2015) reference infers a slowdown of the AMOC from surface cooling the subpolar North Atlantic relative to the Northern Hemisphere mean warming, but can not provide a quantitative estimate of the inferred slowdown. Neither of the other two references (Kelly et al., 2016 or Cunningham et al., 2013) address a 50-year slowdown of the AMOC. Finally the Gulf Stream and AMOC are not interchangeable terms. The Gulf Stream includes a very strong wind-driven component that is bigger than the AMOC transport and can vary for reasons unrelated to the overturning. It would be a mistake to conflate the two terms. 3) Our recent work (Palter et al., 2018 - https://www.earth-syst-dynam-discuss.net/esd-2017-105/#discussion) looks at the the difference in AMOC in a comprehensive climate model when limiting warming to 1.5°C (by overshoot and stabilization pathways) and 2°C, and I believe provides a useful reference in this section. In our model the AMOC declines by 11% under historical forcing, but remains stable in a 1.5°C stabilization pathway that severely limits future emissions. In both the 2°C simulation and our overshoot pathway to 1.5°C, the AMOC declines an additional 23% by 2100. In the overshoot pathway, the AMOC decline peaks about 15 years after the maximum forcing, then recovers only part of the way to the stabilization pathway over the next 15 years. [Jaime Palter, United States of America]	1) The statement around the thermohaline circulation weakening has been replaced by a toned-down and more specific statement on AMOC: "It is more likely than not that the Atlantic Meridional Overturning Circulation (AMOC) has been weakening in recent decades". 2) The revised text includes the relevant references, which constitute new post-AR5 sets of evidence. The references providing evidence for the weakening of the Gulf Stream have been corrected and updated. These are in support of an observed weakening of the Gulf Stream, but we have removed the statement of a 30% weakening. 3) Unfortunately, this study was not available in accepted form at the time of completing Chapter 3 of SR1.5.
41362	56	1	56	3	Level of confidence? [Lourdes Tibig, Philippines]	The section has been revised since the SOD, and uncertainty language and confidence statements were added.
49172	56	1	56	3	As long as the earth rotates and the wind blows, the 'Gulf Stream' is safe. If anything, the AMOC has slowed down. But 30% is not well established I don't think (and missing a reference). [Bill Hare, Germany]	The relevant references are provided in the revised text.
50296	56	1	56	4	I am heavily surprised about this short paragraph. This is wrong. Forst, no reference is given to the extremely strong statement that the AMOC has slowed since a couple of decades. In the AR5 it is clealr stated: "There is no observational evidence of a trend in the AMOC... The statement given here is a very sensitive one, and should be at least based on outcomes of AR5. Again,I strongly recommend to introduce a contributiong author with background in physical oceanography to support this chapter. [Karina VON SCHUCKMANN, France]	The statement around the thermohaline circulation weakening has been replaced by a toned-down and more specific statement on AMOC: "It is more likely than not that the Atlantic Meridional Overturning Circulation (AMOC) has been weakening in recent decades". The revised text includes the relevant references, which constitute new post-AR5 sets of evidence.
7868	56	2	56	3	Gulf Stream has slowed down by 30% since the late 1950s. As far as I know, there is no consensus about it. Please provide refrence. [Petr Zavialov, Russian Federation]	The relevant references are provided in the revised text.
21864	56	6			The sentence "although precise quantification of the added risk due to an additional increase to 2°C is difficult to access" difficulties the reading of the first part of this paragraph. Consider deletion [LUIS VALDES, Spain]	Accepted - Sentence was revised
31692	56	6	56	9	Increasing average surface temperature to 1.5°C will increase these risks although precise quantification of the added risk due to an additional increase to 2°C is difficult to access. The surface layers of the ocean will continue to warm and acidify but rates will continue to vary regionally. Ocean conditions will eventually reach stability around mid-century under scenarios that represent stabilization at or below 1.5°C.' The preceding statements are just assertion, they need to be supported by references or removed. [Simon Josey, United Kingdom (of Great Britain and Northern Ireland)]	These statements have been removed from the section.
39972	56	6	56	6	Increasing average surface temperature to 1.5°C will increase these risks. What "risks"? Please briefly describe since this is a new paragraph [Adi Nugraha, United States of America]	This statement has been removed from the section.
60374	56	6	56	6	Perhaps specify "Increasing average surface air temperature" to avoid confusion [United States of America]	Not applicable - This section was rewritten
39974	56	7	56	8	The surface layers of the ocean will continue to warm and acidify but rates will continue to vary regionally. Do you talk about ocean acidification in this section? Why this comes up as a conclusion. [Adi Nugraha, United States of America]	We have removed this statement from the section, and now deals exclusively with ocean acidification in section 3.3.10.
54186	56	7	56	7	is difficult to access. must be changed to "is difficult to assess." [Jordi Salat, Spain]	Not applicable - This section was rewritten
3568	56	12	57	45	It seems that a paragraph about the links between Arctic sea-ice loss and impacts on Northern Hemisphere mid-latitudes, as well as Arctic amplification, is missing. See Screen et al. (2018, https://www.nature.com/articles/s41561-018-0059-y), Cohen et al. (2014, https://www.nature.com/articles/ngeo2234), and Pithan and Mauritsen (2014, https://www.nature.com/articles/ngeo2071). [David Docquier, Belgium]	We can't discuss impacts because of space constraints.
9570	56	12	57	45	It is alarming that in this discussion of sea ice, there is no Inuit knowledge referenced. This is a substantial gap in this section as there are multiple sources of in-depth Inuit knowledge on sea ice that could be pulled from including monitoring programs like SmartICE (https://www.smartice.org/) and SIKU (https://sikuatlas.ca/index.html) and the Pikialasorsuaq (Northwater polynya) Commission (http://pikialasorsuaq.org/en/) which are a few examples of the extensive resources available on Inuit knowledge of sea ice. Furthermore, in the approaches discussed to deal with the mismatch between the observed and modeled sensitivity of Arctic sea ice, Inuit knowledge is not mentioned. It is crucial (as was stated in Chapter 1) that Indigenous knowledge be applied alongside wester knowledge as research moves forward, especially in the Arctic. It is important that this is reflected here. [Joanna Petrasek MacDonald, Canada]	Noted - this is a wider issue that would need to be addressed at co-chair level.
16098	56	12	57	45	The subsection “Sea ice” is quite compact and is [Australia]	Noted - space constraints and the very wide remit of this chapter mean that available space is greatly limited. SROCC will also discuss this topic.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16100	56	12			This sea ice section largely neglects Antarctica and needs significant additional information, here and later in section 3.4.4.1.6 (p91 - these comments are repeated at both points). While this omission appears to be done on the basis that the ability to project with confidence is low, it overlooks that much is known about drivers and impacts of changes already seen. The rate of change in sea ice in the Western Antarctic Peninsula, for example, is greater than in the Arctic (Massom and Stammerjohn, 2010 doi:10.1016/j.polar.2010.05.001). The report should describe the change that has been seen (modest increase over the satellite era, recently with dramatic reversal, and importantly *large* regional and seasonal changes which make e.g. Antarctic Pensinsula equally a hot spot to the Arctic). This can be done following National Academies report and refs therein (National Academies of Sciences, Engineering, and Medicine. 2017. Antarctic Sea Ice, Variability in the Southern Ocean-Climate System. Washington, DC: The National Academies Press. doi:10.17226/24696.). For a review of Southern Ocean sea ice, their drivers and forcings refer to Hobbs W., R. Massom, S. Stammerjohn, et al.. 2016. A Review of recent changes in . Global and Planetary Change, 143, 228-250. Also see Turner and Comiso 2017, doi:10.1038/547019a. For details of Amundsen sea (large changes) see: Stammerjohn, S.E., et al. 2015. Seasonal sea ice changes in the Amundsen Sea, Antarctica. Elementa: Science of the Anthropocene – Ocean, 3, 000055, doi:10.12952/journal.elementa.000055. [Australia]	We have extended the discussion of Antarctic sea ice to include the observed evolution. However, given the low confidence in model simulations of sea ice in the Southern Ocean, no robust information exists on the future evolution of Antarctic sea ice in low warming scenarios.
28306	56	12	57	46	It should please be explained what the (negative) consequences of an ice free arctic would be. [Germany]	We can't discuss impacts because of space constraints.
34028	56	12	57	45	Please consider to summarise the result and provide a simple conclusion about future Arctic sea ice loss, that can be reused elsewhere in the report. For example, paragraph 3.4.4.1.6 Sea Ice would needs a short conclusion that is consistent with the findings in 3.3.9. [Norway]	Summary has now been concluded
34030	56	12			3.3.9 Sea Ice: We cannot see that sea ice thickness, volume or mass is mentioned in the subsection. When discussing development of Arctic sea ice recently and in future (as in section 3.3.9), the comparison of model results and observations of sea ice extent shows a part of the sea ice development, but changes in volume related to ice thickness are not considered in such comparisons. Please consider to mention this limitation. [Norway]	This information is now included
34032	56	12			3.3.9 Sea Ice: Please consider to check the consistency of the use of the terminology “(nearly) ice-free Arctic (Ocean)” throughout the relevant subsections. If one is simply writing "ice-free Arctic", it can also be misunderstood to extend to land-ice. By using terms such as "sea ice" or "ocean" after Arctic, it is more obvious that it is mainly sea ice one addresses. [Norway]	This has been checked and corrected where needed.
53116	56	12	56	34	The effects of climate change is generally expected to be more pronounced for the Arctic has been warming since 1980s at twice the global rate, a phenomenon known as the Arctic amplification. Evidence of Arctic amplification includes shrinking Arctic sea ice, snow cover and thawing permafrost. Passive microwave images acquired by NASA since 1979 show that the Arctic perennial sea ice has been decreasing at a rate of 2.7 [2.1 to 3.3]% per decade, with larger decreases in summer of 7.4 [5.0 to 9.8]% per decade. It has been shown that river discharge to the Arctic Ocean has surged since the early 21st Century when significant sea ice cover loss was also observed (Zhang et al., 2012. For example, significant Arctic sea ice loss has occurred in the Laptev Sea where the Luna River discharges, the Kara Sea where the Yenisei River discharges and the Barent Sea where the Ob River discharges. There should be more studies on the spatial and temporal relationship between the discharge of major rivers to the Arctic Ocean (Mackenzie river, Nelson river, Lena river, Yenisei river and Ob river) and the Arctic sea ice extent and thickness to be understand the impact of freshwater discharge to the Arctic on sea ice. Zhang, X., J. He, J. Zhang, I. Polyakov, R. Gerdes, J. Inoue, and P. Wu (2012), Enhanced poleward moisture transport and amplified northern high-latitude wetting trend, Nature Climate Change, 3(1), 47-51, doi:10.1038/nclimate1631. [Thian Gan, Canada]	We can't go to this level of detail because of space constraints.
3558	56	14			It is also important to note that Arctic sea ice has been thinning. If you need a reference, you can use Lindsay and Schweiger (2015, https://www.the-cryosphere.net/9/269/2015/tc-9-269-2015.html) who analyzed various sea-ice thickness estimates (airborne, spaceborne, mooring-based and submarine-based) and reported that annual mean sea-ice thickness in the Central Arctic decreased by 65% between 1975 and 2012 (from 3.59 to 1.25m), despite the large uncertainty linked to sea-ice thickness retrievals. [David Docquier, Belgium]	This information is now included
17398	56	14	56	17	Here and elsewhere, either "xx - yy" or "xx to yy", but not both. [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
42788	56	14	56	28	From 1979 to 2011, Arctic sea ice decreased by 40% and resulted in a decline in albedo such that the change in forcing was equivalent to 25% that of CO2 in the same timeframe. Pistone K., et al. (2014) Observational Determination of Albedo Decrease Caused by Vanishing Arctic Sea Ice, PROC. NAT'L. ACAD. SCI. 111(9):3322–3326, 3325 (“The change in annual-mean global-mean surface temperature is 0.69 °C during 1979–2011…we find that during 1979–2011 the Arctic darkened sufficiently to cause an increase in solar energy input into the Arctic Ocean region of 6.4 ± 0.9 W/m2, equivalent to an increase of 0.21 ± 0.03 W/m2 averaged over the globe. This implies that the albedo forcing due solely to changes in Arctic sea ice has been 25% as large globally as the direct radiative forcing from increased carbon dioxide concentrations, which is estimated to be 0.8 W/m2 between 1979 and 2011. The present study shows that the planetary darkening effect of the vanishing sea ice represents a substantial climate forcing that is not offset by cloud albedo feedbacks and other processes. Together, these findings provide direct observational validation of the hypothesis of a positive feedback between sea ice cover, planetary albedo, and global warming.”). [Kristin Campbell, United States of America]	Noted - space constraints limit discussion purely to 1.5/2.0C. Wider issues such as the one raised here should be addressed by SROCC.
43020	56	14	56	28	From 1979 to 2011, Arctic sea ice decreased by 40% and resulted in a decline in albedo such that the change in forcing was 6.4 Wm2 in the Arctic, which is equivalent to 25% that of CO2 in the same timeframe. Pistone K., et al. (2014) Observational Determination of Albedo Decrease Caused by Vanishing Arctic Sea Ice, PROC. NAT'L. ACAD. SCI. 111(9):3322–3326, 3325 (“The change in annual-mean global-mean surface temperature is 0.69 °C during 1979–2011…we find that during 1979–2011 the Arctic darkened sufficiently to cause an increase in solar energy input into the Arctic Ocean region of 6.4 ± 0.9 W/m2, equivalent to an increase of 0.21 ± 0.03 W/m2 averaged over the globe. This implies that the albedo forcing due solely to changes in Arctic sea ice has been 25% as large globally as the direct radiative forcing from increased carbon dioxide concentrations, which is estimated to be 0.8 W/m2 between 1979 and 2011. The present study shows that the planetary darkening effect of the vanishing sea ice represents a substantial climate forcing that is not offset by cloud albedo feedbacks and other processes. Together, these findings provide direct observational validation of the hypothesis of a positive feedback between sea ice cover, planetary albedo, and global warming.”). [Durwood Zaelke, United States of America]	We can't discuss impacts because of space constraints.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53130	56	14	56	28	In our study on the Arctic sea ice, we found the following spatial-temporal variation of sea ice concentration to the high Arctic: 1. Sea ice has an unstoppable decreasing trend at all quantile in all seasons, especially in summer and autumn in time-scale and East Siberian and Chukchi Sea in spatial scale. 2. Arctic Oscillation has less effect on sea ice concentration than NAO and PNA, and mainly influence the Central Arctic in winter. 3. Influence of NAO on the sea ice concentration varies with seasons with enhanced seasaw effect on the Barents Sea and Labrador Sea in spring and winter, a comprehensive positive correlation with summer sea ice and obvious decreasing trend with autumn sea ice in Chukchi Sea. 4. PNA has similar effect with NAO on the sea ice concentration with same seasaw effect on the Barents Sea and Labrador Sea but weaker effect on the Othotsk Sea in winter, a general positive correlation with spring sea ice and a general negative correlation with winter sea ice. 5. The correlation with PDO and SOI are not significant. 6. The high variance of the trend at different quantile levels reflects that the correlation between sea ice and the atmospheric oscillation is non-linear. Maslanik, J., S. Drobot, C. Fowler, W. Emery, and R. Barry (2007), On the Arctic climate paradox and the continuing role of atmospheric circulation in affecting sea ice conditions, Geophysical Research Letters, 34(3), doi:10.1029/2006gl028269. [Thian Gan, Canada]	We can't go to this level of detail because of space constraints.
3554	56	15			Replace 'km' by 'km²'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
56786	56	17	56	17	Missed a space after "1979-…" [Xiaolin Zhang, China]	Not applicable - This sentence was revised
60376	56	17	56	17	This should read "Sea-ice cover ... is projected to decrease in the future.", not "... is simulated to decrease in the future." One is a statement about the planet we all live on, while the other is a statement about models that people may or may not care about. [United States of America]	Corrected.
3556	56	18	56	22	Add the information 'medium confidence' in brackets at the end of the sentence starting with 'Collins' instead of having a full sentence for this statement. [David Docquier, Belgium]	Not applicable - This sentence was rewritten
6592	56	21	56	21	There ismedium confidencein' should be 'There is medium confidence in' [Robert Shapiro, United States of America]	Not applicable - This sentence was rewritten
10748	56	21	56	21	Change to 'respectively. There is medium confidence in these scenarios given…' [Franklin Paredes, Brazil]	Not applicable - This sentence was rewritten
21866	56	21			insert space between "ismedium" and also in between "confidencein" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
29460	56	21	56	21	Please rewrite "medium confidence" between spaces. [Joan A. Lopez-Bustins, Spain]	Not applicable - This sentence was rewritten
39786	56	21	56	21	Insert space in: "ismedium..." [Hernan Edgardo Sala, Argentina]	Not applicable - This sentence was rewritten
40244	56	21	56	21	space between "ismedium" and between "confidencein" [Amal Hussein, Egypt]	Not applicable - This sentence was rewritten
44388	56	21	56	21	There ismedium confidencein these scenarios [Rita Man Sze Yu, China]	Not applicable - This sentence was rewritten
44960	56	21	56	21	ismedium--> is medium [Hiroaki Kondo, Japan]	Not applicable - This sentence was rewritten
50936	56	21	56	21	There is medium confidence in these scenarios instead of "There ismedium confidencein these scenarios" [Amjad Masood, Pakistan]	Not applicable - This sentence was rewritten
53686	56	21	56	21	The word "ismedium" should be corrected as "is medium" [AKM SAIFUL ISLAM, Bangladesh]	Not applicable - This sentence was rewritten
56788	56	21	56	24	Missed a space after (i) "There is…" (ii) "confidence" and (iii) "..2017)" [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
9236	56	22			Please change "modeled" to "modelled" [Marco Turco, Spain]	Accepted - Sentence was revised
123	56	24	56	24	)and to be changed ") and" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
39788	56	24	56	24	Insert space after the closing parenthesis in "Eisenman, 2017)and" [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
44390	56	24	56	24	Space is missing "2017)and to" [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
21868	56	25			insert space between "2017)and" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
41364	56	30	57	21	This discussion of approaches can be condensed and focus be on the assessment of findings with regards the temperature goals. [Lourdes Tibig, Philippines]	Has been condensed
21870	56	33			insert space between "2012)use" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
21872	56	33			Remove . after (2015). [LUIS VALDES, Spain]	Not applicable - This section was rewritten
17400	56	38	56	39	By when? [David Schoeman, Australia]	Accepted - Sentence was revised
17402	56	41	56	49	This paragraph could be rewritten for clarity. [David Schoeman, Australia]	Accepted - Sub-section was revised
57090	56	42			missing space "Knutti (2012)use" [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
39790	56	43	56	43	Insert space after the closing parenthesis in "(2012)use" [Hernan Edgardo Sala, Argentina]	Not applicable - This sentence was rewritten
44392	56	43	56	43	Space is missing "Knutti (2012)use" [Rita Man Sze Yu, China]	Not applicable - This sentence was rewritten
29462	56	46	56	46	Please substitute "(2013)" with "2013)". [Joan A. Lopez-Bustins, Spain]	Not applicable - This sentence was rewritten
44394	56	46	56	46	Collins et al., (2013). [Rita Man Sze Yu, China]	Not applicable - This sentence was rewritten
47266	57		57		Armour et al 2009: Citation used twice with repeated statements on Page 57 and Page 159. The whole paragragh citing this reference is the same in these two sections. [Sarah Connors, France]	The paragraph is re-written
1400	57	1		2	important [Karen Olsen, Denmark]	This is highlighted in a summary paragraph
6216	57	1		2	important [Anne Olhoff, Denmark]	This is highlighted in a summary paragraph
18304	57	1		2	An important finding. [Andrea TILCHE, Belgium]	This is highlighted in a summary paragraph
7814	57	2			(Niederdrenk and Notz what year? [Anthony Lupo, United States of America]	Accepted - Year of publication was added
34034	57	2	57	3	The year for the reference for Niederdrenk and Notz is missing, one can assume that it is the same as in the line before (2017). [Norway]	Accepted - Year of publication was added
39792	57	2	57	2	I suggest to include "boreal" in the middle of "During winter...". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
12880	57	3			…either 1.5°C or 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Accepted - Text was revised with the suggested edit
21874	57	3			insert space between "2016)use" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
34036	57	3	57	6	Space missing before second last word, between "(2016)" and "use". Also other places in the document spaces are missing. [Norway]	Accepted - Text was revised with the suggested edit
39794	57	3	57	3	Insert space after the closing parenthesis in "(2016)use..." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
44396	57	3	57	3	(Niederdrenk and Notz [year?]). Notz and Stroeve (2016)use the [Rita Man Sze Yu, China]	Accepted - Year of publication was added
54698	57	3			(Niederdrenk and Notz) reference correction [Qudsia Zafar, Pakistan]	Corrected.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9238	57	4			Please change "Stroeve (2016)use" to "Stroeve (2016) use" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
3562	57	9	57	21	While this paragraph is interesting, it does not really constitute a way of improving model performance (as model selection and model calibration), but rather a way to estimate Arctic ice-free conditions. I am not sure it is necessary to keep it. Or this paragraph could be combined with the next one. [David Docquier, Belgium]	This has been condensed.
55308	57	9	57	21	There are too many submitted references. Unless published, which means peer review, I suggest to delete these references. [ELISA BERDALET, Spain]	Corrected.
295	57	11	57	11	Need to agree on "submitted" or some other term for as yet unpublished refs throughout chapter to avoid confusion among readers and clearly state "the state' of the ref in both the text and the reference section. [Paul Doyle, Canada]	Corrected.
3564	57	11			Replace '(Jahn)' by 'Jahn (submitted)'. [David Docquier, Belgium]	Accepted - Year of publication was added
21876	57	11			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
34038	57	11	57	14	Line 11: Year for reference to Jahn is missing. [Norway]	Accepted - Year of publication was added
35924	57	11			Reference year for Jahn needs to be added [India]	Accepted - Year of publication was added
39796	57	11	57	11	Consider to replace "(Jahn)" by "Jahn (submitted)" in: "...(Jahn) agrees with recent..." [Hernan Edgardo Sala, Argentina]	Accepted - Year of publication was added
44398	57	11	57	11	CESM model, (Jahn) agrees [Rita Man Sze Yu, China]	Accepted - Year of publication was added
17404	57	13	57	13	Delete "global warming"…at least one of them [David Schoeman, Australia]	Not applicable - This section was rewritten
39798	57	13	57	13	I suggest to shorten the text "...restraining global warming to 1.5°C global warming would lead to...", in the following way: "...restraining global warming to 1.5°C would lead to..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
56322	57	13	57	13	Remove repetition of "global warming". [Annika Herbert, Australia]	Not applicable - This section was rewritten
21878	57	15			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
45994	57	15	57	21	The paper is "submitted" status and seems to be discussions. Conclude before final draft. Even ice regrow, biological condition need more time and can be irreversible, related cascading (AR5 WGII 18-3) but with time delay. [Hiroyuki ENOMOTO, Japan]	Corrected.
60378	57	15	57	18	Quoting very high confidence that "the Arctic will become ice free at 1.5°C global warming with less than 1% probability" ("seasonally ice free", not "permanently ice free"?) based on ensembles of a single model is at odds with the skepticism about the predictive skill of sea-ice projections in coupled climate models rightly expressed on lines 14-28 of p. 3-56. The language summarizing this same point on page 3-66, lines 40-45, is more appropriately nuanced. [United States of America]	Text is re-written
46692	57	17	57	17	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Corrected.
21880	57	18			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
34040	57	18	57	19	Line 19: It should perhaps be a comma instead of full stop (prior to because). [Norway]	Not applicable - This section was rewritten
9240	57	19			Please change "Sanderson et al. (2017). because" to "Sanderson et al. (2017) because" [Marco Turco, Spain]	Not applicable - This section was rewritten
21882	57	19			Replace "because" by "Because" (B in capitals) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39800	57	19	57	19	Please, check wording in: "...a certain warming than Sanderson et al. (2017). because Sanderson et al. (2017)..." [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
57092	57	19			remove dot "Sanderson et al. (2017)." [AMANDINE PASTOR, France]	Not applicable - This section was rewritten
21884	57	20			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
44962	57	20	57	20	Sanderson et al. (2017). --> Sanderson et al. (2017), [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
41366	57	23	57	45	It is being suggested here that the assessment be concise. The discussion jumps from approaches to findings to references to what the specific findings imply. [Lourdes Tibig, Philippines]	Text is re-written
21886	57	24			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
39802	57	24	57	24	The year of publication is missing in "Niederdrenk and Notz". [Hernan Edgardo Sala, Argentina]	Accepted - Year of publication was added
46694	57	24	57	24	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Corrected.
9242	57	25			Please change "modeled" to "modelled" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
39804	57	26	57	26	I suggest to replace "preindustrial" by "pre-industrial", in order to keep consistency of language along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
46696	57	26	57	26	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Corrected.
17406	57	27	57	27	Awkward wording, revise [David Schoeman, Australia]	Accepted - Section was revised
34042	57	27	57	29	Line 29: We suggest another wording, "absent" instead of "lost". [Norway]	Accepted - Sentence was revised
3566	57	28			Remove 'a' before 'some'. [David Docquier, Belgium]	Not applicable - This section was rewritten
5602	57	28	57	28	I do not think it is allowed to cite submitted manuscript [Sandra CASSOTTA, Denmark]	Corrected.
21888	57	28			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
34044	57	29	57	31	Please make sure the references are chronological. [Norway]	Accepted - Sentence was revised
34232	57	33	57	33	Please spell "Arctic" correctly. [Norway]	Accepted - Text was revised with the suggested edit
43022	57	33	57	41	Recent observations of the Arctic sea ice have shown a continued decline of the areal cover and the volume of sea ice. See National Snow and Ice Data Center, Sea ice hits record lows (6 December 2016) ("Through 2016, the linear rate of decline for November is 55,400 square kilometers (21,400 square miles) per year, or 5.0 percent per decade."). This discussion in inconsistent with Box 3.5, which uses the definition: "A tipping point occurs when a small change in forcing (e.g. global temperature) leads to a qualitative change in the future state of a component of the global climate system (Lenton et al., 2008)." This would seem to suggest that arctic summer sea ice loss, regardless of irreversibility, is a tipping point. Further to the discussion here on reversibility, under what conditions would sea ice come back, and how do those relate to 1.5 or 2 pathways? Are there pathways where arctic sea ice would not come back? What are those pathways? How are they achieved? And what is the timescale for the return; one generation, two, or ten? [Durwood Zaelke, United States of America]	This discussion has been changed from a discussion of tipping points to a discussion of hysteresis behaviour

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61868	57	33	57	41	It is not easy for the reader to find what is new since the AR5. I understand that basically the recent literature supports the conclusions of the AR5. there is repetition here with the box on tipping points. [Valérie Masson-Delmotte, France]	Corrected.
39806	57	38	57	38	Use "s" in lower case for "Summer". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
53118	57	42	57	45	See Turner et al. (2013) on climate change impact to the Antarctic sea ice. Turner, J., T. J. Bracegirdle, T. Phillips, G. J. Marshall, and J. S. Hosking (2013), An Initial Assessment of Antarctic Sea Ice Extent in the CMIP5 Models, Journal of Climate, 26(5), 1473-1484, doi:10.1175/jcli-d-12-00068.1. [Thian Gan, Canada]	Noted - report is specifically on 1.5/2.0C so that space constraints limit use of this suggestion. Relevant to SROCC.
2266	57	43	57	45	Collins et al. (2013) have low confidence in Antarctic sea ice projections because of the wide range of model projections and an inability of almost all models to reproduce observations such as the seasonal cycle, interannual variability and a trend towards increased ice extents over recent decades. » Nice. But what is your assessment in term of confidence and likelihoods? Anything new since AR5 Collins et al. (2013) have low confidence in Antarctic sea ice projections because of the wide range of model projections and an inability of almost all models to reproduce observations such as the seasonal cycle, interannual variability and a trend towards increased ice extents over recent decades. » Nice. But what is your assessment in term of confidence and likelihoods? Anything new since AR5 [gerhard Krinner, France]	We have extended the discussion of Antarctic sea ice to include the observed evolution. However, given the low confidence in model simulations of sea ice in the Southern Ocean, no robust information exists on the future evolution of Antarctic sea ice in low warming scenarios.
16102	57	43	57	45	Collins et al. (2013) have low confidence in Antarctic sea ice projections because of the wide range of model projections and an inability of almost all models to reproduce observations such as the seasonal cycle, interannual variability and a trend towards increased ice extents over recent decades. This seems to be a non sequitur. Follow up this statement with its signficance and implications. "Therefore ..." [Australia]	We have extended the discussion of Antarctic sea ice to include the observed evolution. However, given the low confidence in model simulations of sea ice in the Southern Ocean, no robust information exists on the future evolution of Antarctic sea ice in low warming scenarios.
16104	57	43	57	45	There are less than 3 lines on "antarctic sea ice", and all that is state is a 2013 reference, stating that those aithors have "low confidence in Antarctic sea ice projections because of the wide range of model projections and an inability of almost all models to reproduce observations". Not only is this reference outdated, but also there needs to be a proper presentation of the recent and current status of Antarctic sea ice plus changes/trends. There is a substantial body of publications out on this, including those providing insight on the regional and/or seasonal variability of sea ice (i.e., Hobbs, W. R., Massom, R., Sharon Stammerjohn, Reid, P., Williams, G., Meier, W. 2016: A review of recent changes in Southern Ocean sea ice, their drivers and forcings. Global and Planetary Change, 143: 228-250. DOI: 10.1016/j.gloplacha.2016.06.008; Stammerjohn, S. and Maksym, T. (2017) Gaining (and losing) Antarctic sea ice: variability, trends and mechanisms, in Sea Ice, Third Edition (ed D. N. Thomas), John Wiley & Sons, Ltd, Chichester, UK. doi: 10.1002/9781118778371.ch10). This report does not do justice to Antarctic sea ice, please amend. [Australia]	We have extended the discussion of Antarctic sea ice to include the observed evolution. However, given the low confidence in model simulations of sea ice in the Southern Ocean, no robust information exists on the future evolution of Antarctic sea ice in low warming scenarios.
46878	57	43	57	43	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Corrected.
526	58	1	60	10	This discussion of GMSL projection is missing at least three recent papers focused on the question of 1.5 vs 2.0°C projections: Bittermann et al. (2017), Jackson et al. (2018), and Rasmussen et al. (which is cited for other purposes but not for GMSL projections). Bittermann, K., S. Rahmstorf, R. E. Kopp, and A. C. Kemp (2017). Global mean sea-level rise in a world agreed upon in Paris. Environmental Research Letters 12, 124010. doi: 10.1088/1748-9326/aa9def. Jackson, L. P., Grinsted, A., & Jevrejeva, S. 21st century sea-level rise in line with the Paris accord. Earth's Future, 2017EF000688. https://doi.org/10.1002/2017EF000688 [Robert Koppu, United States of America]	Thank you the papers were now included.
2280	58	1	61	4	Section 3.3.10 is very detailed and long, and that's good because the subject is fundamental. However a wrap-up on sentence about the key message (that 1.5 vs 2 does not change the game per se) might be useful [gerhard Krinner, France]	Agreed - the suggestion was implemented.
3574	58	1			A paragraph about observed changes in sea level is lacking at the beginning of this section. References: Church et al. (2013, IPCC), Fasullo et al. (2016, https://www.nature.com/articles/srep31245), Slangen et al. (2016, https://www.nature.com/articles/nclimate2991), SWIPA 2017 report (https://www.amap.no/documents/doc/snow-water-ice-and-permafrost-in-the-arctic-swipa-2017/1610). [David Docquier, Belgium]	Agreed - have inserted.
3596	58	1	61	4	A key study missing in this section is Jevrejeva et al. (2016, http://www.pnas.org/content/113/47/13342). They provide probabilistic sea-level rise projections taking into account regional variations based on CMIP5 model results. They find that more than 90% of coasts experience more than 20 cm sea-level rise with a 2°C warming under RCP8.5 (reached in 2040), with great spatial variations. This study is mentioned in Section 3.4.5.2.2 (P103), but it should also appear here. [David Docquier, Belgium]	Thank you the paper was now included.
9738	58	1	61	4	It is concerning that the sea level section currently lacks comprehensive coverage of the post 2100 time horizon. Individual contributions and caveats should be discussed for the 21st century only based on process based modelling. However, a lot of research based on simplified (even non-SEM) approaches has been conducted that investigating the multi-centennial/millenial SLR response. The fact that SLR will continue post 2100 under 1.5decC/2degC scenarios is key and there are estimates available that will be very helpful for stakeholders. Please expand on the post 2100 perspective, I will provide references wherever I can. Also, the uncertainties and SLR risks (low probability, high impact) associated with strong mitigation scenarios should be covered more extensively, given the new findings on Antarctic dynamics, in particular. [Alexander Nauels, Australia]	this is discussed explicitly at end of section. Text will be moved to 3.6 in TOD and extended.
12042	58	1	58	1	Is there a reason why (as far as I can see, apologies if I missed it) one of the earliest 1.5C vs 2C papers published on any subject, hasn't been included here? Schaeffer et al https://www.nature.com/articles/nclimate1584. Additonal relevant literature has also been recently published, Jackson et al http://onlinelibrary.wiley.com/doi/10.1002/2017EF000688/full [United Kingdom (of Great Britain and Northern Ireland)]	Accepted- both papers are now included.
35106	58	1	58	1	Following relevant study can be added in the section: By 2100, under 1.5 °C, 2.0 °C, and 2.5 °C GMST stabilization, respectively, median GMSL is projected to rise 48 cm (90% credible interval of 28--82 cm), 56 cm (28--96 cm), and 58 cm (37--93 cm). Reference: D.J. Rasmussen, Klaus Bittermann, Maya K Buchanan, Scott Kulp, Benjamin H Strauss, Robert (Bob) Kopp and Michael Oppenheimer (2018). Extreme sea level implications of 1.5 °C, 2.0 °C, and 2.5 °C temperature stabilization targets in the 21st and 22nd century. Environmental Research Letter, https://doi.org/10.1088/1748-9326/aaac87 [Shaukat Ali, Pakistan]	This is discussed later in the subsection.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35926	58	1	61	4	3.3.10 Sea level The Sea Level change over Indian Ocean, Bay of Bengal and Arabian Sea may be included appropriately as described below: Indian Ocean sea level change displays large diverging nature as compared to the rest of the global ocean, and its future projection is also equally ambiguous (Church et al. 2006). Tide-gauge-observed and HYCOM-simulated annual mean sea level data revel that sea level has decreased substantially in the south tropical Indian Ocean whereas it has increased elsewhere in Indian Ocean (Han et al., 2010). This pattern is driven by changing surface winds associated with a combined invigoration of the Indian Ocean Hadley and Walker cells, patterns of atmospheric overturning circulation. The sea level rise over the Arabian Sea and Bay of Bengal from the T/P altimeter monthly mean observations depict that the rate over the Arabian Sea is about 0.5–3 mm/year and over the Bay of Bengal is 0.75 to about 6 mm/year (Parekh et al., 2017). The sea level rise in the Indian ocean over the last 60 years amounts to 1.5 mm/year, which is slightly less than the global average. The AR5 projected sea level rise for all the scenarios with the highest emission scenario (RCP8.5) projecting sea-level rise in the range of 0.45–0.82 m for the late twenty-first century (average over 2081–2100) for the Indian Ocean. Palanisamy et al. (2014) used sea level reconstruction for the period 1950–2009 to understand the sea level change and variability in the Indian Ocean. They found the major contribution of the total sea level rise (about 1.5 mm/year) is of steric origin. Kusche et al. (2016) separated the mass and steric contributions to sea level variability by applying inverse approach (Rietbroek et al. 2012) to the Jason-1/2 radar altimetry and Gravity Recovery and Climate Experiment (GRACE) data and revealed that steric origin sea level change in the Bay of Bengal dominates by a factor of two over the mass-driven sea level change. References: Parekh, A., Gnanaseelan, C., Deepa, J.S., Karmakar, A. and Chowdary, J.S. (2017). Sea Level Variability and Trends in the North Indian Ocean. In: Rajeevan M., Nayak S. (eds) Observed Climate Variability and Change over the Indian Region. Springer Geology. Springer, Singapore Han, W., Meehl, G., Rajagopalan, B., Fasullo, J., Hu, A, Lin, J., Large, W, Wang, J-W, Quan, X.-W., Trenary, L., Wallcraft, A., Shinoda, T., Yeager, S. (2010). Patterns of Indian Ocean sea-level change in a warming climate. Nature Geoscience. Published online: 11 July 2010. Church J A, White N J and Hunter J R (2006), Sea-level rise at tropical Pacific and Indian Ocean islands; Global and Planetary Change, 53 155–168. Kusche, J., B. Uebbing, R. Rietbroek, C. K. Shum, and Z. H. Khan (2016), Sea level budget in the Bay of Bengal (2002–2014) from GRACE and altimetry, J. Geophys. Res. Oceans, 121, doi:10.1002/2015JC011471. Palanisamy, H., Cazenave, A., Meyssignac, B., Soudarin, L., Wöppelmann, G. and Becker, M. (2014) Regional sea level variability, total relative sea level rise and its impacts on islands and coastal zones of Indian Ocean over the last sixty years. Global Planet. Change, doi:10.1016/j.gloplacha.2014.02.001. Rietbroek R, Brunnabend SE, Kusche J, Schröter J (2012) Resolving sea level contributions by identifying fingerprints in time-variable gravity and altimetry. J Geodyn 59:72–81. [India]	LAs have been advised to focus on 1.5-2.0°C and avoid a general discussion of SLR. This comment appears to relate to observed SLR and RCP8.5 projections and are therefore deemed out of scope.
41368	58	1	61	4	The detaileddiscussion on sea level rise, including contributions to changes from the different sources isappreciated. It is however, suggested that a clear description of the changes be crafted. The review should be transformed into an assessment. [Lourdes Tibig, Philippines]	Agreed will phrase as assessment
40252	58	1	64	6	The coastal zones of Egypt extend for over 3,500 km in length along the Mediterranean and Red Sea coasts. The Mediterranean shoreline is most vulnerable to sea level rise due to its relative low level compared to the land around it. The Delta and its north coast are hosts to several main towns and cities such as Alexandria, Port Said, Damietta, and Rosetta, accommodating several millions of population, and large investments in industrial, touristic and agricultural activities as well as in the infra-structure serving these activities. These are all vulnerable to sea level rise. Moreover, sea level rise willhave a direct effects on the quality of groundwater in the coastal aquifers (Reference: Third National Communication Reports of Climate Change in Egypt (2016). http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	it does not concern Box 3.4
40254	58	1	64	6	Additionally, through the climatic scenarios for Egypt it is expected that a sea level will rise up to 100cm until year 2100. This will make the coastal governorates become the most vulnerable including the south Mediterranean coastal areas of Al-Burullus and Manzala. There are indications that the city of Damietta, Rasel-Barr, Gamasa, the areas around Al-Burullus Lake, Al-Manzala Lake and Bardaweel Lake will be inundated between 2040 and 2050. Due to the uneven topographical nature of the coastal area between Damietta and Rosetta, this area is predicted to become separate islands surrounded by water from all directions. (Reference: Third National Communication Reports of Climate Change in Egypt (2016) http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	it does not concern Box 3.4

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49174	58	1			This chapter falls short of summarising the state of knowledge on SLR and ice sheet that has evolved since the AR5. In particular the parts on Greenland and Antarctica do no reflect the in parts paradigm shifting advances in knowledge since 2013. It needs to be expanded and restructured. This is a key chapter to this report and in particular linked to questions of impacts beyond GMT and scenario dependence that are currently completely lacking from this chapter. Here's a suggestion (including key references that should be assessed: 1. Updates since the AR5 including observations adn advances in modelling including ice sheet instability 1. Scambos TA, Bell RE, Alley RB, Anandakrishnan S, Bromwich DH, et al. 2017. How much, how fast?: A science review and outlook for research on the instability of Antarctica's Thwaites Glacier in the 21st century. Glob. Planet. Change. 153(April):16–34 2. Khazendar A, Rignot E, Schroeder DM, Seroussi H, Schodlok MP, et al. 2016. Rapid submarine ice melting in the grounding zones of ice shelves in West Antarctica. Nat. Commun. 7:13243 3. Christianson K, Bushuk M, Dutrieux P, Parizek BR, Joughin IR, et al. 2016. Sensitivity of Pine Island Glacier to observed ocean forcing. Geophys. Res. Lett. 43(20):10,810-817,825 4. Alley KE, Scambos TA, Siegfried MR, Fricker HA. 2016. Impacts of warm water on Antarctic ice shelf stability through basal channel formation. Nat. Geosci. 9(4):290–93 5. Greenbaum JS, Blankenship DD, Young D a, Richter TG, Roberts JL, et al. 2015. Ocean access to a cavity beneath Totten Glacier in East Antarctica. Nat. Geosci. 8(March):6–10 6. Gasson E, DeConto R, Pollard D. 2015. Antarctic bedrock topography uncertainty and ice sheet stability. Geophys. Res. Lett. 42(13):2015GL064322 7. Medley B, Joughin I, Smith BE, Das SB, Steig EJ, et al. 2014. Constraining the recent mass balance of Pine Island and Thwaites glaciers, West Antarctica, with airborne observations of snow accumulation. Cryosph. 8(4):1375–92 8. Favier L, Durand G, Cornford SL, Gudmundsson GH, Gagliardini O, et al. 2014. Retreat of Pine Island Glacier controlled by marine ice-sheet instability. Nat. Clim. Chang. 4(2):117–21 9. Joughin I, Smith BE, Medley B. 2014. Marine Ice Sheet Collapse Potentially Underway for the Thwaites Glacier Basin, West Antarctica. Science. 344(6185):735–38 10. Mouginot J, Rignot E, Scheuchl B, Fenty I, Khazendar A, et al. 2015. Fast retreat of Zachari{æ} lsstr{ø}m, northeast Greenland. Science. aac7111 11. Rignot E, Fenty I, Xu Y, Cai C, Kemp C. 2015. Undercutting of marine-terminating glaciers in West Greenland. Geophys. Res. Lett., pp. 1–9 12. Feldmann J, Levermann A. 2015. Collapse of the West Antarctic Ice Sheet after local destabilization of the Amundsen Basin. Proc. Natl. Acad. Sci. 112(46):14191–96 13. Wise MG, Dowdeswell JA, Jakobsson M, Larter RD. 2017. Evidence of marine ice-cliff instability in Pine Island Bay from iceberg-keel plough marks. Nature. 550(7677):506–10 14. Mengel M, Feldmann J, Levermann A. 2015. Linear sea-level response to abrupt ocean warming of major West Antarctic ice basin. Nat. Clim. Chang. 6(January): 15. Mengel M, Levermann A. 2014. Ice plug prevents irreversible discharge from East Antarctica. Nat. Clim. Chang. 27(May):1–5 [Bill Hare, Germany]	Noted - many of these references full outside of the strict remit of this report and should be dealt with in SROCC.
57722	58	1	61	5	This section on sea level rise would be greatly clarified with headers for each region. Also, consider adding a table to summarize contributions from thermal expansion, mountain glaciers, ice sheets, and fresh water movement under 1.5°C and 2°C warming scenarios [William Kochtitzky, United States of America]	There are not enough information to populate table of the sort requested, however the table is added summarising 1.5/2.0°C projection papers. Subsection is now much shorter so that the need for further headings is reduced.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49176	58	1			2. SLR until 2100 on 1.5 vs 2 add: 1. Bittermann K, Rahmstorf S, Kopp RE, Kemp AC. 2017. Global mean sea-level rise in a world agreed upon in Paris. Environ. Res. Lett. 12(12):124010 #Add a table table including 2100 rates of rise from different estimates. It is perfectly fine to use emulator models like e.g. Mengel et al 2016 calibrated against more complex models to project within the calibration range. 3. SLR beyond 2100 # Consider using modified Figure from Clark et al. 2016. # Re-iterating 2.3m/per Deg C warming long-term equilibrium from Levermann et al. 2013, already cited in the AR5. # Linkage to scenario characteristics and overshoots (see e.g Mengel et al 2018) # Reversibility (add: Bouttes N, Gregory JM, Lowe JA. 2013. The Reversibility of Sea Level Rise. J. Clim. 26(8):2502–13) 4. Regional SLR and extremes Additional refs that need to be assessed and discussed. Note that for example Vitousek provides estimates for ranges in line with the GMSLR range investigated here. 1. Rietbroek R, Brunnabend S-E, Kusche J, Schröter J, Dahle C. 2016. Revisiting the contemporary sea-level budget on global and regional scales. Proc. Natl. Acad. Sci. USA. 113(6):1504–9 2. Slangen ABA, Carson M, Katsman CA, van de Wal RSW, Köhl A, et al. 2014. Projecting twenty-first century regional sea-level changes. Clim. Change. 124(1–2):317–32 3. Vitousek S, Barnard PL, Fletcher CH, Frazer N, Erikson L, Storlazzi CD. 2017. Doubling of coastal flooding frequency within decades due to sea-level rise. Sci. Rep. 7(1):1399 4. Widlansky MJ, Timmermann A, Cai W. 2015. Future extreme sea level seesaws in the tropical Pacific. Sci. Adv. 1(September):1–9 5. Buchanan MK, Kopp RE, Oppenheimer M, Tebaldi C. 2016. Allowances for evolving coastal flood risk under uncertain local sea-level rise. Clim. Change. 137(3–4):347–62 [Bill Hare, Germany]	discussion moved to 3.6. levermann figure discussed.
62718	58	1	58	1	there will need to be a careful effort made to insure consistency between the sea-level section here and the corresponding material in the Special Report on Oceans and Cryosphere. It will be a challenge for the Synthesis if there are inconsistencies. [Greg FLATO, Canada]	Agreed. SROCC CLA has commented on SOD.
1402	58	3		14	Too detailed [Karen Olsen, Denmark]	Accepted. The opening paragraph is shortened.
6218	58	3		14	Too detailed [Anne Olhoff, Denmark]	Accepted. The opening paragraph is shortened.
18306	58	3		14	This is probaly too detailed given that the components of GMSL are discussed in the subsequent paragraphs. [Andrea TILCHE, Belgium]	Accepted. The opening paragraph is shortened.
3570	58	4			Replace 'variation' by 'variations'. [David Docquier, Belgium]	Rejected - variation around a mean is not plural
528	58	5	58	5	What about extreme sea levels associated with tides (as in Sweet and Park, 2014)? [Robert Koppu, United States of America]	Agreed.
3572	58	5			Remove 'projected'. It is GMSL in general and not projected GMSL which is the sum of contributions. [David Docquier, Belgium]	Agreed.
39808	58	5	58	5	Because GMSL is already defined in the previous line, consider replace "Projected Global Mean Sea Level (GMSL) change is..." by: "GMSL change is..." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
57712	58	7	58	7	I would change "as well as anthropogenic intervention in water storage on land" to just "fresh water storage on land". Even if there is non-anthropogenic water storage movement it will impact sea level rise. [William Kochtitzky, United States of America]	Agreed.
24216	58	11	58	11	1.5oC" the degree has different font [Nazan AN, Turkey]	Not applicable - This section was rewritten
9740	58	12	58	13	This distinction between process based models and SEMs is outdated (at least when treating SEMs in the classical sense, i.e. observed relationship between RF/GMT and SLR informs future response). Sea level emulators have been developed that are calibrated against process-based pojections for each sea level component, avoiding the caveats rightly criticised by Church et al. 2013. Please see, for example, Perrette et al. 2013, Wong et al. 2017, Schleussner et al. 2016, Wong et al. 2017, Nauels et al. 2017 GMD. Please consider changing sentence to "... before considering total GMSL projections, including those made by simplified modelling approches." [Alexander Nauels, Australia]	There is a distinction between process-based models and the class of models described here as SEMs. Agreed that emulators is a better name and will amend through rest of subsection
9742	58	13	58	13	centennial and millenial [Alexander Nauels, Australia]	Not Applicable- the line is now deleted.
14172	58	16	58	40	Church et al.'s (2013); Marzeion et al. [Rongshuo Cai, China]	Not applicable - This section was rewritten
21890	58	16			Remove 's after "al." [LUIS VALDES, Spain]	Not applicable - This section was rewritten
46698	58	16	58	21	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not Applicable- the line is now deleted.
50298	58	16	58	17	Changes in global mean surface air temperature are not the principal driven of GMSL. It is the Earth Energy Imbalance, and related cryosphere and ocean warming (ice melt/ocean mass change, thermosteric expansion). As it is written here it is wrong, and needs to be corrected. [Karina VON SCHUCKMANN, France]	Not Applicable- the line is now deleted.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53120	58	16	58	25	Dyurgerov and Meier (2005) calculated that the contribution of glaciers and ice caps to sea level rise from 1960 to 2004. They show that the annual rate averaged about 1 mm a-1 by 2000 and the cumulative total was 22 mm. Meier et al. (2007) expand on those results and show that the ice mass change for 1995–2005 was -402 ±95 Gt a-1, of which the glaciers around the Gulf of Alaska contributed a quarter. The change of ice mass around the Gulf of Alaska increased dramatically from -40 Gt a-1 during 1961–90 to -86 Gt a-1 for 1990–2004 (Meier et al., 2007). In 2006, glaciers and ice caps were accounting for 1.8 mm a-1 of the 3.1 ± 0.7 mm a-1 of sea level rise. Dyurgerov, M.B. and Meier, M.F. 2005. Glaciers and the changing Earth system: a 2004 snapshot., Inst. Arct. Alp. Res. Occas. Pap. 58, Boulder: Univ. Colo. 117 pp. Meier, M.F. and 7 others. 2007. Glaciers dominate eustatic sea-level rise in the 21st century. Science, 317 (5841):1064– 67. [Thian Gan, Canada]	The suggested papers are not included because they are not relevant to SLR at 1.5 and 2.0°C.
17654	58	17	58	17	Replace "principle" with "principal". [Sai Ming Lee, China]	Not applicable - This section was rewritten
3576	58	22	58	25	Add a reference at this end of this sentence, e.g. Schoof (2007, http://onlinelibrary.wiley.com/doi/10.1029/2006JF000664/full). [David Docquier, Belgium]	Agreed
16106	58	22	58	25	One important feature of MISI is due to the setup of bedrock, which has a landward-deepening slope. This critical information is missing here. [Australia]	Agreed
3790	58	23	58	23	onthe -> on the [Olaf Eisen, Germany]	Not applicable - This section was rewritten
3792	58	23	59	38	Marzeion et al cited without year (also at other places!) [Olaf Eisen, Germany]	Accepted - Year of publication was added
6594	58	23	58	23	focusses onthe continued' should be 'focuses on the continued' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10750	58	23	58	23	Change to 'and focusses on the continued,…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21892	58	23			insert space between "onthe" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
35108	58	23	58	23	The spacing is missing among the words "on the [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
39810	58	23	58	23	Insert space in: "onthe". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44964	58	23	58	23	on the-->on the [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
56790	58	23	58	23	Missed a space after "on.." [Xiaolin Zhang, China]	Not applicable - This section was rewritten
57714	58	23	58	23	change "onthe" to "on the" [William Kochtitzky, United States of America]	Not applicable - This section was rewritten
2268	58	24	58	24	on the [gerhard Krinner, France]	Not applicable - This section was rewritten
50300	58	27	58	27	Thermal expansion is not identified as the dominant term, it is one of the dominant terms. Ocean mass changes are more dominant. [Karina VON SCHUCKMANN, France]	Not applicable - the line was deleted as part of shortening
46700	58	28	58	28	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - the line was deleted as part of shortening
2256	58	29	58	29	RCP3-PD is the scenario usually called RCP2.6, isn't that right? In that case better use "RCP2.6" to be consequent with the rest of the paragraph and the report. [Gustav Strandberg, Sweden]	Not applicable - This section was rewritten
9744	58	29	58	29	very old reference, please update and exspand. Cite Zickfeld et al. 2013 and others [Alexander Nauels, Australia]	Schewe 2011 is 2011 compared to Zickfeld 2013 and therefore not "very old" - however Zickfeld is relevant and is added - discussion moved to 3.6
50590	58	29	58	29	Replace "RCP3-PD scenario" by "RCP2.6 scenario (then called RCP3-PD)". [Jacob Schewe, Germany]	The text was moved to 3.6 and discussion
530	58	30	58	32	Schewe et al (2011) is discussed in a way that makes it difficult to compare (due to different time periods) to Church et al 2013. [Robert Koppu, United States of America]	The paragraph was reworded in response to comment #9744
50302	58	30	58	30	its not "slow ocean heat uptake", it is linked to huge heat capacity of ocean water [Karina VON SCHUCKMANN, France]	Agreed- it was reworded
50304	58	32	58	32	References missing [Karina VON SCHUCKMANN, France]	It relates to the Schewe paragraph and was reworded and moved to 3.6
13872	58	36	58	49	This paragraph (Impacts of high mountain glaciers) should be mentioned in the executive summary page 8 line 34 on “climate characteristics of 1.5C world” i.e. in page 9 line 48-49 (not only Greenland and Antarctic ice). [Raden Dwi SUSANTO, United States of America]	check with CLAs
46702	58	36	58	36	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable- the line was deleted as part of shortening
57718	58	36	58	49	More references should be added here. For example, Huss and Hock (2015 in Frontiers of Earth Science. [William Kochtitzky, United States of America]	Huss et al 2015 is not
53122	58	36	58	49	Holland et al. (2010) assess Arctic sea ice mass budgets for the 20th century and project changes through the 21st century using 14 coupled global climate models. They show that large inter-model scatter in contemporary mass budgets is strongly related to variations in absorbed solar radiation, due mainly to differences in the surface albedo simulations. All models simulate a 21st century decrease in ice volume resulting from increased annual net melt, but the models vary considerably in the magnitude of ice volume loss and the relative roles of changing melt and growth in driving it. Models with thicker initial ice in the mid-20th century generally exhibit larger volume losses. Change in net ice melt is significantly related to changes in downwelling longwave and absorbed shortwave radiation. Eight of the models show the Arctic as being ice free in September by AD 2100 and some as early as 2050 for the A1B emissions scenario. Holland, M.M., Serreze, M.C. and Stroeve, J. 2010. The sea ice mass budget of the Arctic and its future change as simulated by coupled climate models. Clim. Dynam. 34: 185-200. [Thian Gan, Canada]	This relates to sea ice - this is a fairly old paper and not specific to 1.5/2°C - it is not used.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
57710	58	37	58	39	I see little evidence for the claim this sentence makes. At a minimum this sentence needs citations. We know that sea level rise is expected to increase in the future and and low-elevation ice melt has contributed substantially to sea level rise, but this mischaracterizes it. Is tropical ice low elevation? No, but it has seen massive retreat. A better phrase would be "ice below the equilibirum line altitude" or "ice below the 0°C isotherm". I have also never seen evidence that mountain glaciers will maintain a fairly constant mass loss through time. There is basically no way this is possible as it is more likley that melt rates will increase and then decrease. Huss and Hock (2015) present eveidence to counter the claim made in this sentence. They show that mountain glacier mass balance is expected to increasingly negative, especially under RCP8.5. At a minimum, a specific RCP scenario and reference should be added to this sentence. [William Kochtitzky, United States of America]	Not applicable- the sentence was deleted.
3578	58	40			Add year after 'Marzeion et al.' [David Docquier, Belgium]	Accepted - Year of publication was added
7572	58	40	58	40	...Marzeion et al. public. Year missing, also in line 45 [Jens Zinke, Germany]	Accepted - Year of publication was added
7816	58	40			Mazeion [Anthony Lupo, United States of America]	Accepted - Year of publication was added
9746	58	40	58	40	which Marzeion paper? please add year. [Alexander Nauels, Australia]	Done - it was a Mendeley issue
32486	58	40	58	40	Marzeion et al. citation missing year. [Rosanne Martyr-Koller, Germany]	Accepted - Year of publication was added
32488	58	40	58	43	Rephrase to past tense [Rosanne Martyr-Koller, Germany]	Rejected - this is a matter of style
35110	58	40	58	40	The year of study is missing with the cititaion Marzeion et al. [Shaukat Ali, Pakistan]	Accepted - Year of publication was added
39812	58	40	58	40	The year of publication is missing in "Marzeion et al." [Hernan Edgardo Sala, Argentina]	Accepted - Year of publication was added
40246	58	40	58	45	the year of the reference "Marzeion et al." is missed [Amal Hussein, Egypt]	Done - it was a Mendeley issue
296	58	42	58	42	.....scenarios in the glacier.... [Paul Doyle, Canada]	Accepted - Text was revised with the suggested edit
532	58	42	58	43	Should the units here be meters rather than mm? [Robert Koppu, United States of America]	Accepted now mm
2270	58	42	58	42	scenariosn [gerhard Krinner, France]	Accepted - Text was revised with the suggested edit
3580	58	42			Replace 'scenatiosn' by 'scenarios'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
6596	58	42	58	42	scenatiosn in the glacier' should be scenarios in the glacier' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7574	58	42	58	42	...scenatiosn, change to scenarios [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
7818	58	42			scenatiosn needs to be fixed. [Anthony Lupo, United States of America]	Accepted - Text was revised with the suggested edit
10752	58	42	58	42	Change to 'scenarios in the glacier contribution…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
17408	58	42	58	42	Replace "sceanariosn" with "scenarios". [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
29464	58	42	58	42	Please rewrite "scenarios". [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised with the suggested edit
32490	58	42	58	42	Spelling: "scenarios" instead of "scenatiosn" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
34748	58	42	58	42	scenarios is mispelled scenatiosn [Jaime Palter, United States of America]	Accepted - Text was revised with the suggested edit
39814	58	42	58	42	Typo in "scenatiosn". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
44966	58	42	58	42	What is 'scenatiosn'? [Hiroaki Kondo, Japan]	corrected
57716	58	42	58	42	I have no idea what this word is trying to say: "scenatiosn" [William Kochtitzky, United States of America]	Accepted - Text was revised with the suggested edit
534	58	43	58	43	Are the numbers from Marzeion et al a confidence range or a metric of intermodel spread? [Robert Koppu, United States of America]	Noted - text states 90% CI
9748	58	45	58	45	which Marzeion paper? please add year. [Alexander Nauels, Australia]	Done - it was a Mendeley issue
62400	58	45	58	45	Please verify this reference "Marzeion et al."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Year of publication was added
536	58	47	58	49	On what timescale would this equilibrium GMSL rise be realized? [Robert Koppu, United States of America]	Thank you a good point - the paper indicates "(over the course of centuries)". This have been added to the text.
32492	58	47	58	49	Please also address committed sea-level rise even if the Paris Agreement 2C target is schieved. See, e.g., Mengel et al., 2018. "Committed Sea level rise under the Paris Agreement and the legacy of delayed mitigation action". Nature Communications (2018)9-601; 2) [Rosanne Martyr-Koller, Germany]	Noted - this is now discussed in long-term section 3.6
3862	58	48	58	48	provide a reference for the low glacier volume [Roderik VAN DE WAL, Netherlands]	It is clear that this relates to previously cited Marzeion paper
9244	58	52			Please correct "scenatiosn" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
3864	59	1	59	1	specify that furst refers to Greenland [Roderik VAN DE WAL, Netherlands]	Accepted - Text was revised
9750	59	1	59	1	Sentence incomplete. [Alexander Nauels, Australia]	Accepted - Text was revised
17410	59	1	59	3	This sentece needs editing for grammar [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
32494	59	1	59	1	Add "of the" after "…make projections" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised
32496	59	1	59	1	State which emission scenario [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
56324	59	1	59	1	Change to "projections of Greenland…." [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit
56326	59	1	59	1	Specify which emission scenario is meant. [Annika Herbert, Australia]	It is reworded so that it is clear we refer to RCP2.6
57720	59	1	59	1	change "projections Greenland" to "projections for the Greenland" [William Kochtitzky, United States of America]	Accepted - Text was revised
61872	59	1	59	59	I suggest to also report sea level rise projected beyond 2100 for 1.5°C or 2°C global warming (e.g. Mengel et al Nature Comm 2018) together with an assessment of confidence in methods. [Valérie Masson-Delmotte, France]	Accepted - discussed in revised section 3.6 on long term.
155	59	2	59	8	This would be a good spot to mention observations of Antarctic accumulation changes, and explain relation or lack thereof to model estimates. [Michael Oppenheimer, United States of America]	Noted, although space is tight and this would seem to be a topic better addressed in SROCC
3866	59	3	59	3	leave out "to be ….. model" [Roderik VAN DE WAL, Netherlands]	Accepted - Text was revised
46704	59	3	59	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted, thank you
153	59	4	59	6	The assertion that the scenario-dependent estimates are too high is important but the rationale for the judgment needs to be given. If this is the expert judgment of the current chapter authors, it should be labeled as such. A confidence level should be given as well. [Michael Oppenheimer, United States of America]	reworded and downplayed. This is
16108	59	5	59	5	It's not appropriate to use "over estimate" here, since we don't know which one (Fuerst et al. 2015 or Church et al. 2013) gives better (more reliable) projection range. [Australia]	Agreed - it was removed.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
154	59	6	59	7	Rasmussen et al (submitted) gives Greenland contribution for 2100 for 1.5 and 2C - they are identical. [Michael Oppenheimer, United States of America]	Rasmussen is not a process based model of the greenland ice sheet in the way that Fuerst is.
9752	59	6	59	7	Please clarify that you're only referring to the GIS contribution here. As for total SLR, this statement isn't true (Schleussner et al. 2016, Mengel et al. 2018 Nature Communications). [Alexander Nauels, Australia]	There is no literature using physical-based models of GIS, papers cites used estimates of GIS from physical models only - nonetheless it is reworded.
538	59	9	59	34	Would be helpful to make clear early on that this discussion is dividing Antarctica into accumulation and discharge terms (especially since this is different than the SMB/dynamic divide used in AR5). [Robert Koppu, United States of America]	Agreed - Antarctic paragraph now defined mass fluxes.
9754	59	9	59	15	I find it misleading to start AIS assessment with such a strong statement on SMB. Given existing observations from Rignot, Joughin and other, it would be more appropriate to highlight response uncertainties under strong mitigation scenarios an the WAIS topic earlier on. Also, by citing DeConto in the subsequent parapgraph you basically contradict the SMB sea level fall statement, as they include SMB in their assessment which is not negative in total (at least for 1 sigma). [Alexander Nauels, Australia]	The whole paragraph was reworded so that SMB no downplayed
2272	59	11	59	15	Antarctica may become a source of future GMSL fall if snow accumulation increases due to the increased moisture-bearing capacity of a warmer atmosphere. » rather: if snow fall increases overcompensate for mass loss through increased melt and ice flow. [gerhard Krinner, France]	The paragraph has been reworded in response to other comments. This line is no longer used.
29466	59	13	59	13	Please make clearer the meaning of this sentence. [Joan A. Lopez-Bustins, Spain]	Concerns about modeling detail - it is reworded.
61870	59	13	59	13	I think that the slope reported here refers to local surface air temperature. It would be nice to check if such a relationship is supported by ice core data at centennial scales (cf Stenni et al, TC, 2017 and Thomas et al, CP, 2017 for estimates of temperature and surface mass balance trends over the past centuries in various regions). [Valérie Masson-Delmotte, France]	This is not directly relevant to 1.5/2°C discussion.
156	59	17	59	17	Why not mention Ritz et al? They use A1B rather than RCPs but surely a useful comparison can be made. Also, in the next paragraph, you do reprot results based on SRES. [Michael Oppenheimer, United States of America]	Ritz is not relevant to 1.5/2.0°C
39816	59	19	59	19	SeaRISE has not been previously defined in this chapter. I suggest to replace it by its full wording: "Sea-level Response to Ice Sheet Evolution (SeaRISE)" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
17412	59	20	59	20	Here, and elsewhere, be careful of how you use "however" in the middle of a sentence… [David Schoeman, Australia]	Accepted - Text was revised
32498	59	20	59	20	0.02m-0.14m: please state explicitly whether this is the contribution to GMSL [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
157	59	22	59	23	It would be helpful to prefigure the statement later on about a threshold near 1.5C with a comment about DeConto and Pollard nonlinear change above RCP2.6 temperatures. [Michael Oppenheimer, United States of America]	paragraph moved to 3.6
3582	59	23			Remove 'While'. [David Docquier, Belgium]	Not applicable - This section was rewritten
32500	59	23	59	23	Change "While" to "Finally, " [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
3868	59	24	59	24	it is not only melt at the GL which is different so please rephrase it to a more general formulation [Roderik VAN DE WAL, Netherlands]	Paragraph is now omitted.
46706	59	26	59	26	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The paragraph has been reworded in response to other comments. This line is no longer used.
158	59	28	59	35	There are 3 issues in this paragraph. First, putting the judgment in the passive form is inappropriate. Second, the word "inconsistent" in the second senetence is not right. You aren't pointing up an inconsistency. Rather, by pointing to Jenkins and to Nias, you are asserting, I think, that representation of ocean processes and resulting dynamical response in the models mentioned in the previous paragraph is not sufficient. If that's the case, say so explcitly. Third, it in unclear what bearing the point about the Cornford et al finding, which is about surface mass balance, has on the possible inadequacy of the ocean and dynamic components of the above models. This paragraph could use a total rewrite - you are trying to make an important comment on the significance of model agreement in the previous paragraph but you muddle it. Finally, if you do make a judgment, either cite a paper for the judgment or if its an expert jedgment by the chapter authors, then make that clear and take ownership either by using first person or if you do use passive tense, accompany that with a confidence statement. [Michael Oppenheimer, United States of America]	The paragraph has been reworded in response to other comments. This line is no longer used.
9756	59	28	59	34	At some stage, the observed WAIS changes and the potential for already triggered irreversible retreat have to be mentioned (Rignot, Joughin etc). Why have they been left out? [Alexander Nauels, Australia]	Accepted. Sentence on observed changes was added
2274	59	31	59	34	This is illustrated by Cornford et al. (2015) who find that SRES scenario E1 (emissions stabilized at 500 ppm CO2 by 2050) results in greater GMSL rise than A1B because ocean warming in both A1B and E1 is similar and generates similar increases in outflow, however increases in snow fall caused by atmospheric warming (e.g., Frieler et al. 2015) have a greater compensatory effect in A1B. » Is this non-difference between E1 and A1B consistent with what is said in the ocean part of the chapter ? [gerhard Krinner, France]	The paragraph has been reworded in response to other comments. This line is no longer used. Ocean part of the chapter does not discuss this because of a lack of space.
3870	59	31	59	34	complicated phrasing the previous sentence suggests the importance of oceanography to be be important and in the next sentence it jumps back to snow fall, which is not the big deal, so elaborate more on the importance of the oceanography rather than jumping back and forth [Roderik VAN DE WAL, Netherlands]	The paragraph has been reworded in response to other comments. This line is no longer used.
16110	59	31	59	34	Why are these old scenarios being used here? What is the relevance to the 1.5C question? [Australia]	This is because no other literature is available. Sentence is removed in response to other reviewers comments.
28308	59	31	59	31	There is no E scenario family in the SRES scenarios, please clarify. [Germany]	The paragraph has been reworded in response to other comments. This line is no longer used.
29468	59	31	59	34	Please indicate that these scenarios are coming from AR4. [Joan A. Lopez-Bustins, Spain]	The paragraph has been reworded in response to other comments. This line is no longer used.
9758	59	36	59	37	While the current assessment in this section may suggest that there is no process-based literature on the difference between 1.5 and 2 degC, it doesn't reflect avavailable publications. Schleussner et al provide an assessment on exactly these differences using an emulator framework based on process-based projections. [Alexander Nauels, Australia]	Schleussner is discussed on the next page - it uses emulation and is not a process-based model.
32160	59	36	59	40	This statement contradicts with Chap3 pg 60 line 1-10 [Jamaica]	This is not the case - the statement here relates to process based literature, the statement p60,1-10 relates to SEM-based approaches (which will be referred to as emulation in the next draft).

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32504	59	36	59	47	Seems better suited in the sea-ice section. [Rosanne Martyr-Koller, Germany]	It is hard to understand this comment - this paragraph is clearly related to sea level and ice sheets.
36440	59	36	60	1	Comment that there is insufficent literature contradicts within the 2 pages (at least 6 papers are cited) [Snaliah Mahal, Saint Lucia]	The literature is cited, but it does not offer a complete GMSL projection hence it is not sufficient.
44400	59	38	59	38	Year is missing "(Marzeion et al.)." [Rita Man Sze Yu, China]	Accepted - Year of publication was added
62716	59	38	59	38	this is one example of many in which a citation is incomplete (missing year). These will all need to be corrected. [Greg FLATO, Canada]	Accepted - Year of publication was added
35928	59	39	59	39	assessment of a likely range of 0.26–0.55 m GMSL rise….. (Add year) [India]	Done
46708	59	39	59	39	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Thank you, it is checked and correct - quoted from AR5.
297	59	42	59	42	Church et al. (2013) assigned..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
298	59	42	59	42	SEM Example of acronym that is not in the Report glossary. (I'd forgotten that it was defined on previous page.) Report glossary should be thoroughly checked to determine that all acronyms are included in it. [Paul Doyle, Canada]	Noted - term SEM no longer used for these models in response to the reviewer comments
7820	59	42			Church et al. (2013) [Anthony Lupo, United States of America]	Not applicable - This section was rewritten
9760	59	42	60	10	Again, please make sure that you do not put a wide range of simplified sea level modeling appproaches into the SEM basket. Sea level emulators do not rely on observed changes to provide projections, but they are calibrated against process-based projections, which, e.g., allows to provide RCP2.6 estimates consistent with AR5 until 2300 (Nauels et al. 2017). This paragraph has to be revised to cover simplified approaches and their capabilities/caveats correctly. As is, the reader gets the impression that everything but actual process-based modeling is not trustworthy. This is not true (see emulator explanation). Obviously, simplified approaches have significant caveats and are only complementary to process-based modeling. But they do have value and must be used in order to cover the post 2100 time horizon. [Alexander Nauels, Australia]	Accepted- the emulation-based approach is now used.
21894	59	42			Replace "Church et al. (Church et al., 2013)" by "Church et al. (2013)" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
44402	59	42	59	42	Church et al. (Church et al., 2013) assigned low confidence [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
57576	59	42	59	42	Revise citation style [Hans Poertner, Germany]	Not applicable - This section was rewritten
62402	59	42	59	42	Please choose the correct reference "Church et al. (Church et al., 2013)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
3584	59	43			Revert 'the' and 'in'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6598	59	43	59	43	same the in past' should be 'same in the past' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
21896	59	43			Replace "same the in past" by "same in the past" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
32502	59	43	59	43	Change "the in" to "in the" [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
56328	59	43	59	43	Change to "in the past". [Annika Herbert, Australia]	Not applicable - This section was rewritten
56792	59	43	59	43	in the past instead of "the in past" ? [Xiaolin Zhang, China]	Accepted.
2276	59	44	59	44	Probable future changes in the relative contributions of thermal expansion, glaciers and (in particular) ice sheets invalidate this assumption. » Reformulate, please (although the next sentence makes things clear) [gerhard Krinner, France]	Not applicable - This section was rewritten
159	59	45	59	45	related should be replaced by "other". For example, Kopp et al 2014 doesn't use a SEM but does make other innovations in SLR modeling that attempt to address shortcomings in process-based modeling available at the time, as did SEMs. [Michael Oppenheimer, United States of America]	Accepted- the emulation-based approach is now used.
540	59	45	59	47	Neither Kopp et al 2014 nor Nauels et al 2017 are SEM frameworks. Kopp et al 2014 uses a bottom-up accounting approach similar to AR5, while Nauels et al 2017 uses reduced-complexity models to represent different components. (Kopp et al 2016, cited elsewhere, does present a SEM.) [Robert Koppu, United States of America]	Accepted- the emulation-based approach is now used.
3872	59	47	59	49	p 3-59 So can we use SEMs now in reliable way? unclear what the sentence implies. If you take a componentwise SEM is it ok? and what is that case the outcome?? [Roderik VAN DE WAL, Netherlands]	The sentence was reworded so that now it is clear that emulation-based approaches can be used - in particular here where process-based literature is inadequate
46710	59	47	59	49	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The use of likely here was not intended to be IPCC language, hence no italics were used.
3586	59	48			Remove 'the' before 'much'. [David Docquier, Belgium]	Not applicable - This section was rewritten
56330	59	48	59	48	Remove "the", so it reads: "because much of the…" [Annika Herbert, Australia]	Not applicable - This section was rewritten
9762	60	1	60	10	All of these studies do not account for the new dynamics suggested by DeConto. While these suggested instability processes need further investigation, they already pose a risk (low probability, high impact) that has to be accounted for when discussing SLR under strong mitigation sceanrios. While median estimates are similar for AR5 AIS and DeConto AIS responses under RCP2.6 the tails look very different. In this context, the recently published Mengel et al 2018 Nature Communications piece should be covered to a) show the 2300 SLR legacy under Paris Agreement (PA) (which includes the 1.5 and 2 degC distinction) and b) elaborate on the risk of multi-meter SLR despite strong mitigation measures in line with the PA. [Alexander Nauels, Australia]	discussed in 3.6 long -term
61876	60	1	60	49	is there any implication of an overshoot for sea level aspects? [Valérie Masson-Delmotte, France]	Noted - discussed in long term section 3.6
542	60	2	60	5	The Sanderseon et al. (2017) numbers, which reportedly use the Kopp et al. (2016) SEM, are markedly higher than the numbers from Bittermann et al. (2017) and Rasmussen et al., which are by some of the same authors as Kopp et al. (2016) and definitely use the Kopp et al. (2016) model. [Robert Koppu, United States of America]	Agreed, a table was added to reflect this and it will comment on it, although comparing 90 and 66% ranges and different baseline.
16112	60	4	60	4	It would be better to report estimates of GMSL rise relative to current day rather than to preindustrical, to be consistent with the reporting by the other two studies. Otherwise, it's hard to compare them. [Australia]	Agreed that this would be optimal however it would require agreement on difference between PI and PD.
9764	60	5	60	5	Shouldn't it be Schleussner et al. 2016? [Alexander Nauels, Australia]	Yes.
49178	60	5	60	7	This refers to Schleussner et al. (2016, ESD)?. This paper uses MAGICC for the GMT projections and a scaling method by Perrette et al. (2013). [Bill Hare, Germany]	Yes.
29470	60	8	60	8	In other references under submission, "(submitted)" is not written. Please homogenize it along the manuscript. [Joan A. Lopez-Bustins, Spain]	Accepted - Text was revised and homogenized

Comment No	From Page	From Line	To Page	To Line	Comment	Response
36442	60	10	60	15	No comment/reference is made to the comparision between 1.5 and 2 degree Celius. Also, there needs to be clarity on the concept of ice shee degradation [Snaliah Mahal, Saint Lucia]	Hard to understand this comment - this paragraph is about the difference between 1.5 and 2.0°C.
44404	60	10	60	10	Space is missing "~0.1m difference in" [Rita Man Sze Yu, China]	Accepted - Text was revised
49180	60	10			By 2100. This is a major finding and should be lifted up in the Executive summary. [Bill Hare, Germany]	Agreed.
544	60	12	60	14	Also important are changes in Earth rotation and vertical land motion associated with mass redistribution, and VLM from other soruces [Robert Koppu, United States of America]	Agreed, reworded to include it.
1404	60	12		28	Good! This is the stuff we want to read [Karen Olsen, Denmark]	Thank you!
6220	60	12		28	Good! This is the stuff we want to read [Anne Olhoff, Denmark]	Thank you!
18308	60	12		28	This sort of insight should be the focus of this chapter. [Andrea TILCHE, Belgium]	Agreed. Thank you.
3892	60	13	60	15	add rotational but on top Here a big omission is made or at least it is ambiguously. There is variability which is important to determine flood frequencies, but in addition coastal sea level is determined by a number of additional processes which are not captured in the climate models, like wave run up, swell, waves etc. This needs to be specified explicitly in my view [Roderik VAN DE WAL, Netherlands]	Agreed, reworded to include it.
28310	60	14	60	14	The word step is missing ("The second step maps...") [Germany]	Not applicable - This section was rewritten
11998	60	15	60	28	Structure a little unclear here - discusses differences in 1.5 and 2 degree world, then discusses a 1 degree world. Comparing apples and oranges so this section could benefit from better signposting. [United Kingdom (of Great Britain and Northern Ireland)]	It was clarified by adding a reference to PI
3588	60	19			Add year after 'Rasmussen et al.' [David Docquier, Belgium]	Accepted - Year of publication was added
7822	60	19			. Rasmussen et al, what year [Anthony Lupo, United States of America]	Accepted - Year of publication was added
9766	60	19	60	19	which Rasmussen paper? please add year. [Alexander Nauels, Australia]	Accepted - Year of publication was added
18310	60	19	60	23	It seems far fetched to extrapolate the results of flooding to 2200 or 2150, given the many variables and uncertainties associated with, e.g., population projections, response measures, etc. Use more useful timeframes (2050). It should also be made clear that people affected are estimated in a scenario with no (additional) adaptation responses! [Andrea TILCHE, Belgium]	Removed - text was moved to 3.4 which is one human impacts
21898	60	19			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
40248	60	19	60	19	the year of the reference "Rasmussen et al." is missed [Amal Hussein, Egypt]	Year is added. It was a Mendeley issue.
44406	60	19	60	19	Year is missing "rise. Rasmussen et al. use this approach " [Rita Man Sze Yu, China]	Accepted - Year of publication was added
50938	60	19	60	19	year of publication is missing in reference in "Rasmussen et al." [Amjad Masood, Pakistan]	Year is added. It was a Mendeley issue.
546	60	21	60	23	Rasmussen et al use population inundated as a metric of land area not people -- they count people currently living in areas that will be inundated, but do not make or employ any demographic or migration projections. [Robert Koppu, United States of America]	Removed - text was moved to 3.4 which is one human impacts
17414	60	22	60	22	Are the people really going to be inundated, or the areas in which they currently live. Words matter! [David Schoeman, Australia]	Not applicable - This section was rewritten
9768	60	23	60	23	This reference is very old. Please update. [Alexander Nauels, Australia]	Is this referring to Schleussner? One of a few papers which is relevant to SL impacts of AMOC for low-end scenarios under discussion here.
16114	60	23	60	28	It is not clear how AMOC scales with GMSL, needs to be clarified. It seems like a lot of text used to discuss as effect likely to raise sea level in New York City by 4 cm in 2100. Also what is the "CP3-PD scenario? [Australia]	The text was reduced - CP3 scenarios were already clarified in brackets.
9770	60	26	60	26	RCP3-PD is basically RCP2.6 if I am not mistaken. Maybe change to avoid confusion. [Alexander Nauels, Australia]	accepted. text moved to 3.6 and discussion
34750	60	28	60	28	AMIC should be AMOC [Jaime Palter, United States of America]	Accepted - Text was revised with the suggested edit
39818	60	28	60	28	Consider to replace "AMIC" by "AMOC". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
56794	60	28	60	28	AMOC instead of "AMIC"? [Xiaolin Zhang, China]	Done.
60380	60	28	60	28	AMIC should be "AMOC". [United States of America]	Accepted - Text was revised with the suggested edit
61874	60	28	60	28	AMIC should be AMOC [Valérie Masson-Delmotte, France]	Accepted - Text was revised with the suggested edit
9772	60	30	60	47	This section on post 2100 GMSLR is key and should be expanded with more references to recent studies. Currently, published 2300 estimates under RCP2.6 yield around 1 meter of GMSLR rel to 1986-2005 (Nauels et al 2017), without showing any signs of stabilisation. Mengel et al. 2018 actually show the PA SLR legacy based on a set of simplified scenarios that capture the underlying mitigation targets. Also, the Clark et al. 2016 NatCC study on multi-millenial SLR should be discussed with numbers. [Alexander Nauels, Australia]	this discussion now move to 3.6 completely and clark is discussed there
6600	60	31	60	31	as proportion to' should be 'as proportional to' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
56332	60	31	60	31	Change "proportion" to "proportional". [Annika Herbert, Australia]	Not applicable - This section was rewritten
3590	60	32			Revise brackets. [David Docquier, Belgium]	Not applicable - This section was rewritten
3794	60	32			) missing [Olaf Eisen, Germany]	Not applicable - This section was rewritten
29472	60	32	60	32	A bracket is missing after "2012)". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
56796	60	32	60	32	Missed a half bracket. "…(for instance,…" [Xiaolin Zhang, China]	Not applicable - This section was rewritten
21900	60	33			insert space between "certain(Church" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39820	60	33	60	33	Insert space before the opening parenthesis in "certain(Church et al" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44286	60	33	60	33	needs space between "certain (Church" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
44408	60	33	60	33	virtually certain(Church et al., 2013) [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
56798	60	33	60	33	Missed a space after "..certain.." [Xiaolin Zhang, China]	Not applicable the section is revised.
548	60	36	60	36	Millennia as well as centuries [Robert Koppu, United States of America]	Accepted - Text was revised
3796	60	36	222	1	multiple instances (>10 times): blank before paranthesis missing, e.g. "centuries(" [Olaf Eisen, Germany]	Not applicable - This section was rewritten
21902	60	36			insert space between "centuries(Clark" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39822	60	36	60	36	Insert space before the opening parenthesis in "centuries(Clark et al.," [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44288	60	36	60	36	needs space between "centuries (Clark et al" [Moshe Kinn, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
44410	60	36	60	36	over future centuries(Clark et al., 2016; [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
56800	60	36	60	36	Missed a space after "…futrue centuries.." [Xiaolin Zhang, China]	Not applicable - This section was rewritten
2278	60	39	60	39	Definition of irreversible mass loss: not clear why SMB<0 should be a threshold for this, as there is total mass loss possible also in cases where SMB>0. [gerhard Krinner, France]	The section was reworded and incorporated in to 3.6

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16116	60	41	60	41	Church et al. (2013) reportes this threshold to be between 0.8 and 2.2oC (90% confidence), rather than 2oC and above (see their Fig. 13.14c). This threshold range implies it's possible to have very different Greenland contriubtion to the GMSL rise between 1.5oC and 2oC worlds. [Australia]	The paragraph is combined with material in 3.6. Robinson - the basis of Church's assessment is 0.8 to 3.2.
3876	60	42	60	45	unclear to which ice sheet is referred suppose Greenland. In addition to the peak tempearture the evolution of temperature may matter, this deserves mentioning [Roderik VAN DE WAL, Netherlands]	The line is removed - it is shortened and combined with material in 3.6
55992	60	44	60	47	Median range noted by Robinson of 1.6 degrees is relevant and should be cited. Suggest, "..depends strongly on the magnitude and duration of higher temperatures. Were…." [Pamela Pearson, United States of America]	Done.
29474	60	45	60	47	Please review writing. [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
46712	60	46	60	46	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable- the is line removed.
1406	61		64		See my previous comment on the size of boxes [Karen Olsen, Denmark]	shortened
6222	61		64		See my previous comment on the size of boxes [Anne Olhoff, Denmark]	shortened
9070	61				1FOOTNOTE During the last millions of years, the glacial-interglacial alternations are … should be better as "1FOOTNOTE During the last 2.6 million years (Quaternary Period), the glacial-interglacial alternations are …" because this is the period of geological history when this alternation is dominant and most characteristic. [Alejandro Cearreta, Spain]	Footnote removed
16128	61		61		The Footnote needs to be rewritten for a more accurate description of the orbital forcing of climate [Australia]	Footnote removed
18312	61		64		This box is very long. Some effort is needed to extract and present its key points, including how they are supported by the figure [Andrea TILCHE, Belgium]	shortened
48288	61		66		Add the following items to box 3.4: (a) 3.3.12.4: Dust Storms, Aeolian Loess Deposits, Sand Dunes and Sheets , (b) 3.3.12.5 Desiccated Water Bodies including Lakes, Marshes and Salt Flats and (c) 3.3.12.6 Migrations and Demology effects [Iran]	This suggestion is interesting but needs more space, this is not possible to add something in this much shortened version
56336	61		61		Footnote: change "last millions of years" to "last 3 million years". Change "in" to "at", so it reads: "received at each…" [Annika Herbert, Australia]	Not applicable - This text was deleted
3594	61	1			It is also considered in Ritz et al. (2015, https://www.nature.com/articles/nature16147), but they make projections based on A1B (and not RCP2.6). [David Docquier, Belgium]	It is not relevant to 1.5/2°C warming.
55994	61	1	61	1	Suggest add, "and for Thwaites in West Antarctica (Joughin et al 2015). All suggest…." [Pamela Pearson, United States of America]	There are numerous papers on individual ice streams (PIG. TG) - little justification for citing this one, especially as not 1.5/2°C scenarios are mentioned.
160	61	2	61	4	The final sentence in this subsection makes a critically important point but is so poorly written that the point could be lost to the reader entirely. DeConto and Pollard, highly relevant to the threshold issue and mentioned earlier, should be cited here, as well. Take some space to explain the issue, the relevant studies, the evidence at hand, and if possible, make a confidence judgment on the question of whether there is a threshold near 1.5 or 2C. [Michael Oppenheimer, United States of America]	this discussion moved to long-term 3.6 and strengthened significantly
9774	61	2	61	4	This sentence contains an incredibly strong message, but it is currently not referenced to any study. Two papers from last year (Wong et al. 2017 Climatic Change, Nauels et al. 2017 ERL) have found a similar range of threshold temperatures for their AIS rapid discharge parameterisations, with a lower limit of 1.9 degC rel to 1850. These studies would support this statement and could be cited here. [Alexander Nauels, Australia]	wong is a parameterization of results from true process-based models such as goledge and deconto and pollard. It is not a surprise that they identify similar thresholds.
3592	61	3			Replace 'are' by 'is', and 'require' by 'requires'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3878	61	4	61	4	unclear on which you base this, seems speculative [Roderik VAN DE WAL, Netherlands]	The paragraph was reworded in response to comments #9774 and #160.
9776	61	4	61	4	It may be important to mention at the end that the new generation of scenarios to be used in AR6, the Shared Socioeconomic Pathways (SSPs), do not provide dedicated pathways to achieve the 1.5degC target (yet). A first SLR analysis of the strong mitigation SSPs has been conducted by Nauels et al. 2017 ERL, with around 52 [34–75] cm of GMSLR in 2100 under the 2.6 Wm-2 target (including DeConto rapid dynamics that increase the uncertainty range). [Alexander Nauels, Australia]	Noted, although space is tight and it would introduce text not directly related to 1.5/2.0°C
55996	61	4	61	4	Suggest add, "..a conclusion supported by the paleo-climactic record (see box below) and a number of polar scientists (ICCI, 2015). Cite: ICCI (2015). Thresholds and Closing Windows: Risks of Irreversible Cryosphere Climate Change. International Cryosphere Climate Initiative, Burlington, Vermont, US. [Pamela Pearson, United States of America]	This report seems to be grey literature - 'reviewers' also seem to have been involved in writing - not externally reviewed.
35292	61	6	64	4	The differences T and atmospheric CO2 between the different periods are discussed in the text, but as the text is rather long, it could be worth adding a summary of the key differences in a Table (or a caption) supporting Figure 1 Box3.4. This could improve readability and facilitate the analysis of Figure 1. [Ana Bastos, France]	Accepted - Text was reworded to ensure clarity
39824	61	6	61	6	Remove "[START BOX 3.4 HERE]" [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
41370	61	6	64	6	Very informative for non-experts reading and understanding [Lourdes Tibig, Philippines]	thank you
550	61	8	61	8	Paleontological is a weird word choice here -- much of the evidence is geochemical or sedimentological. [Robert Koppu, United States of America]	Accepted - Sentence was revised
2304	61	8	64	3	I could not find any references in Box 3.4 in the reference list. [Shoji Hashimoto, Japan]	Accepted - Reference was added to the list of references
3880	61	8	61	8	I think paleontological is too specifc you need a more general paleo term [Roderik VAN DE WAL, Netherlands]	Accepted - Sentence was revised
9066	61	8			The sentence: "Box 3.4: Paleontological evidence for understanding 1.5–2ºC warmer worlds" is not correct as the information contained in this box is based on geochemical data as well as data from fossil organisms. Consecuently, it should be better as "Box 3.4: Evidence from paleorecords for understanding 1.5–2ºC warmer worlds". [Alejandro Cearreta, Spain]	The title has been changed and paleontological replaced by past
21904	61	8			In box 3.4., the following citations: "Brigham-Grette et al., 2013" "Hoffman et al., 2017" "Marcott et al., 2013" "Valdés, 2011", are not listed in the list of references at the end [LUIS VALDES, Spain]	Accepted - Reference was added to the list of references
44412	61	8	64	4	Box 3.4 is very long, can it be shortened to 2 pages? [Rita Man Sze Yu, China]	shortened

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61878	61	8	63	20	Change title (the content is not from paleontological evidence but also other lines of evidence for characterizing past warm climates). Please use the AR5 report, WGI chapter 1 (Masson-Delmotte et al 2013) as a starting point and only provide updates, as for other elements of this chapter. Avoid refering to a "guardrail concept" and harmonize the style with the rest of the chapter. Do not use undefined jargon ("paleoresearch", "paleoevidence", "paleorecord", "paleo observations") and use language understandable by non specialists (e.g. "evidence from natural archives", "estimates of past temperature"...). Please describe the direct sea level geological evidence for a partial collapse of the Greenland ice sheet during the Last interglacial. I am not convinced that we have any evidence for a collapse and any method to separate the contribution from Greenland from that from Antarctica. The Schaefer et al 2016 reference is not provided in the final chapter reference list. Please rewrite the box to make clear what is the starting point (key findings of AR5), new evidence and revised findings (which ones) specific to 1.5°C-2°C. Some statements are not correct (comparison of LIG rate of sea level rise with today's one, the data suggest similar or up to twice larger, not "likely two times larger"). Check the calibrated IPCC language (likely has a special meaning here). Do not speculate on policies (guardrail, safeguarding). The last paragraph on equilibrium climate sensitivity should be either merged to section 2.6 of chapter 2 (addressing climate sensitivity) or removed from the assessment here (what is the implication for 1.5°C-2°C?). The whole box should also be very clear that there is no past analogue (rate of CO2 increase in the atmosphere today / Pliocene; characteristics of orbital forcing for recent interglacials vs CO2 forcing). Finally, it would be helpful to stress how a climate stabilization at 1.5°C or 2°C would achieve with respect to past climate variations (a level encoutered or not during past interglacial periods but with a different orbital context and more CO2? a level comparable to that of the Pliocene?). This would be very relevant for the report. The text of the box does not support the statements in the figure. Why are there n/a statements for the most recent period (does it mean no significant change or no information?). [Valérie Masson-Delmotte, France]	The new version of the box is mainly based on these comments
552	61	10	61	19	There are no citations in this paragraph. The EECO CO2 estimates seem remarkably narrow. [Robert Koppu, United States of America]	This period is not anymore taken into account
39826	61	10	61	10	Consider to replace "(with essentially modern geographies)" by "(essentially with modern physical geography)". [Hernan Edgardo Sala, Argentina]	corrected
62404	61	10	61	10	No need to add this "(with essentially modern geographies) issues [JACQUES-ANDRE NDIONE, Senegal]	corrected
55998	61	11	61	12	Suggest for clarity use 7-12,000 years ago and 118-131,000 years ago, etc. This box is important and should be more clerarly formulated. [Pamela Pearson, United States of America]	Not applicable - text has been revised
9068	61	12	61	13	The term "Mid Pleistocene Warm Period (MPWP, 3.3–3.0 Ma) is incorrect. It should be "Mid-Pliocene Warm Period (MPWP, 3.3–3.0 Ma)" which is a different epoch of the geological record. [Alejandro Cearreta, Spain]	right! Corrected
12000	61	12	61	13	Mid-Pliocene Warm period, not mid-Pleistocene. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised with the suggested edit
16118	61	13	61	17	Use "millions of years ago" rather than "Ma" for better understanding by non-scientists [Australia]	precised
28312	61	13	61	13	The Pleistocene starts ~2.6 million years b.p; the period given for the mid Pleistocene warm period must be wrong, please revise. [Germany]	right! Corrected
57578	61	13	61	13	greenhouse GAS concentrations? [Hans Poertner, Germany]	no we have mainly information for CO2
16120	61	14	61	14	Footnote: Add "and albedo feedbacks" to the end of the sentence, as these also contribute to amplify orbital changes. [Australia]	footnote removed
60382	61	15	61	15	… time period in Earth history, where CO2 concentrations were similar... should be "... time period in Earth's history when CO2 concentrations were similar ..." [United States of America]	Not applicable - This section was rewritten
161	61	16	61	16	Use of "risk" should be restricted to situations where impacts and physical causes are both involved. The proper term here would be "probability". [Michael Oppenheimer, United States of America]	This sentence is not anymore present in the final version
16122	61	21	61	26	Please rewrite as "We use past warm climates as 'analogs' for future warmer periods because the climate models used for future climate …" Remove "An alternative observation-based approach…" It's not "observation-based" in the same sense as the historical instrumental record, as this approach depends on indirect proxies rather than observations. [Australia]	This has been removed for reasons of shortening
21678	61	21	61	21	Guardrail is not a scientific term nor how temperature goals are viewed in policy, and should be avoided. [Sweden]	removed
28314	61	21	61	22	The formulation is misleading. For the planet itself, the temperature rise does not cause any problems. The average surface temperature of the Earth varied between +- 15°C compared to today during the history of the earth. Please find a more suitable description. [Germany]	This has been removed for reasons of shortening
124	61	26	61	26	Fisher et al. Is missing the year of publication [teodoro georgiadis, Italy]	submitted
7576	61	26	61	26	(Fischer et al.). public. Year missing [Jens Zinke, Germany]	Accepted - Year of publication was added
21906	61	26			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
56334	61	26	61	26	Change "observation" to "reconstruction". [Annika Herbert, Australia]	Not applicable - This section was rewritten
62408	61	26	61	26	Please verify this reference "(Fischer et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Year of publication was added
16124	61	27	61	28	Please define "Earth System Sensitivity (ESS)". [Australia]	This has been removed for reasons of shortening
3798	61	33	222	1	multiple instances (>10 times): blank after paranthesis missing, e.g. "2013)and" [Olaf Eisen, Germany]	Accepted - Text was revised
9246	61	33			Please change "2013)and" to "2013) and" [Marco Turco, Spain]	Not applicable - This section was rewritten
39828	61	33	61	33	Insert space after the closing parenthesis in "2013)and..." [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
62410	61	33	61	33	Please widen the space between "2013)and," and "and" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
46714	61	37	61	37	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text was revised
16126	61	38	61	39	Delete "unmitigated" as RCP8.5 is warmer than any suggested Pliocene temperatures. [Australia]	Accepted - Text was revised with the suggested edit
3800	61	44	61	44	In footnote: the process is more complicated, as not only amplification occurs but also not-well understood alterations in the periodicity, e.g. at the mid-Pleistocene transition. [Olaf Eisen, Germany]	This has been removed for reasons of shortening
17416	61	44	61	44	The footnote needs editing for grammar, including terminal punctuation. [David Schoeman, Australia]	Not applicable - This text was deleted
6602	62	3	62	3	associated to the proxies' should be 'associated with the proxies' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
39830	62	3	62	3	Typo in "uncertaintlies" [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
3802	62	6	62	6	add "at current rates" after long time. [Olaf Eisen, Germany]	not anymore present
16130	62	6	62	8	Rewrite as "Though warmer than the preindustrial period, the HTM and LIG had greenhouse gas concentrations similar to the preindustrial atmosphere (Bereiter et al., 2015; Loulergue et al., 2008; Schneider et al., 2013)." The point about "runaway" greenhouse gas effects does not logically follow, and "runaway" effect are not defined here. [Australia]	The new version is simpler

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16132	62	6	62	14	The focus of this paragraph is confused. It mixes time scales and mechanisms. It should clearly address the question of what the paleo-record has to tell us about carbon cycle feedbacks associated with 1.5 to 2C warming. [Australia]	This has been removed for reasons of shortening
46716	62	9	62	9	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text was revised
55790	62	9			melts ? thaws [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised
16134	62	10	62	10	Paleoresearch into historical times does not make sense. Replace with "research". [Australia]	Accepted - Text was reworded to ensure clarity
3804	62	18	62	18	blank missing before likely [Olaf Eisen, Germany]	Not applicable - This section was rewritten
3728	62	20	62	23	I suggest regional disappearance of species but not always extinction [Castor Muñoz Sobrino, Spain]	This has been removed for reasons of shortening
39832	62	26	62	26	Consider to replace "temperature forests" by "temperate forests". [Hernan Edgardo Sala, Argentina]	corrected
54188	62	26	62	26	and temperature forests must be changed to "and temperate forests" [Jordi Salat, Spain]	Accepted - Text was revised with the suggested edit
56338	62	26	62	26	Change "temperature" to "temperate". [Annika Herbert, Australia]	Accepted - Text was revised with the suggested edit
17418	62	30	62	30	Awkward wording, revise [David Schoeman, Australia]	Accepted - Sentence was reworded to ensure clarity
56340	62	30	62	30	Rephrase. [Annika Herbert, Australia]	Accepted - Sentence was reworded to ensure clarity
16136	62	42	62	49	The issue of involvement of E. Antarctica is important and strongly indicated for LIG high end sea level estimates. There is strong evidence of EAIS mass loss in the Totten GI catchment (Aitken et al., 2016, doi:10.1038/nature17447) although timing is uncertain. Here, there are indications of the configuration of the ice sheet. A nice way to cap off this matter following line 49 would be to add a short sentence"something like: "There is evidence for significant long term past losses in E. Antarctica (Aitken et al., 2016; Gulick et al., 2017) and thresholds for future losses are not yet well characterised. [Australia]	All that has been simplified
46718	62	42	62	42	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text was revised
554	62	45	62	47	See also Yau, A. M., Bender, M. L., Robinson, A., & Brook, E. J. (2016). Reconstructing the last interglacial at Summit, Greenland: Insights from GISP2. Proceedings of the National Academy of Sciences, 113(35), 9710-9715., [Robert Koppu, United States of America]	given the shortening requested, the new text is based on a single review paper
24222	62	45	62	46	The sea level evidence of a partial collapse of the GIS, however, is supported by direct geological observations" different font [Nazan AN, Turkey]	Accepted - Text was revised
12002	62	47	62	49	Antarctic Ice Sheet *may* have been reduced during the MPWP - should also mention papers by Austermann et al., (2015) and Winnick and Caves (2015) which suggest that AIS could be less susceptible to retreat than indicated in DeConto and Pollard (2016). [United Kingdom (of Great Britain and Northern Ireland)]	it is indicated with conditional
16138	62	48	62	48	The claim by Dutton et al. (2015) of sea level more than 6m above present in the MPWP is controversial. This sentence should include a qualifier, such as "it is inferred that reduced ice sheets existed". [Australia]	possibly is added
162	63	2	63	6	This passage draws incorrect conclusions from Kopp et al 2013. The rates are millennial averages and the paper makes very clear that not much can be said about rates of sea level change on shorter time scales. Imagine that the 3-4m SLR equivalent contained in WAIS were discharged rapidly, say over one century, due to MISI or a combination of processes,but that SLR before and after were much slower. The millennial average would be 3-4mm/yr but melting would not have taken "a long time" which here seems to mean "many millennia". This passage needs to be rewritten so the message is clear and correct.. [Michael Oppenheimer, United States of America]	This has been removed for reasons of shortening
16140	63	3	63	9	Rewrite as "Sea-level changes within the LIG were likely between 3 and 4 7 mm yr–1 (1000-year average) (Kopp et al., 2013) i.e. likely two times larger than the highest rise rates observed during the last two decades. Given these rate constraints from paleo observations, melting of parts of the GIS and WAIS will take a long time. This implies long lag times in ice sheet response, a clear concern for ..." The conclusion that melt rates are "unstoppable" does not follow from this argument. Indeed the Pleistocene sea level cycles show that high sea level rise rates are not "unstoppable", they're just not stoppable quickly. This is the key policy relevant point. [Australia]	This has been removed for reasons of shortening
46720	63	3	63	7	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text was revised
556	63	4	63	5	3 mm/yr is roughly the same as GMSL rise observed since 1993, not two times larger. [Robert Koppu, United States of America]	This sentence is not anymore present in the final version
3882	63	4	63	4	the coupled model by Helsen et al. 2012 shows much lower rates of SLR in the Eemian so this contrast the statement in the report. I have trust in those model results… [Roderik VAN DE WAL, Netherlands]	not anymore discussed
17420	63	4	63	4	Awkward wording, revise [David Schoeman, Australia]	Accepted - Text was revised
558	63	5	63	5	These "rate constraints" aren't really constraints, but observations of a world that is somewhat but not directly analogous to a 1-2°C warmer world. They are also 1 kyr averages, and don't say that much about sub-millennial rates. [Robert Koppu, United States of America]	not anymore discussed
16142	63	5	63	6	It is not clear what relevance the melt rates during LIG have to the present day. Surely the rate of melting depends on the rate of temperature increase? [Australia]	it is simply to indicate the long time scale involved
56342	63	5	63	5	Change "observations" to "reconstructions" [Annika Herbert, Australia]	Not applicable - This section was rewritten
560	63	6	63	8	Due to differences in orbital forcing, the Last Interglacial is analogous to but not identical to a 1-2°C world; global mean SST appears roughly comparable to today (Hoffman et al 2017) but peak polar temperatures may be more like a 2°C world (though asynchronous between the poles). Claim of analogy needs citation. Hoffman, J.S., P.U. Clark, A.C. Parnell, and F. He, 2017: Regional and global sea-surface temperatures during the last interglaciation. Science, 355, 276-279. http://dx.doi.org/10.1126/science.aai8464 [Robert Koppu, United States of America]	the term of analogy is not anymore used
16144	63	9	64	18	There is no discussion here of the changes in ocean chemistry that would be associated with 1.5c and 2C warming, and concominant carbon dioxide levels. [Australia]	it is not possible to discuss that in this shortened version
56000	63	9	63	9	Add, "However, based on the record risks of triggering such a large sea-level rise response are likely much less at 1.5 degrees, though cannot be ruled out even with a 1.5 degree guardrail." [Pamela Pearson, United States of America]	This sentence is not anymore present in the final version
21908	63	18			insert space between "warming,likely" [LUIS VALDES, Spain]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39834	63	18	63	18	Please, insert space after the comma in "warming,likely". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
46722	63	18	63	18	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. Text was revised
3884	63	19	63	19	there is a whole suit of papers Paleosens, Kohler von der Heydt which might be condensed here [Roderik VAN DE WAL, Netherlands]	Rejected. A single review paper is cited
56002	63	19	63	19	Add, "inundation and needed human migration, including loss of key sites of the human historical record (Marzeion and Levermann, 2014). [Pamela Pearson, United States of America]	in the final version, reference to policies needed for present is removed
50658	63	21	63	22	Box 3.4, Figure 1, exercise caution about increase in Monsoon in S. Asia. The jury is undecided [Jagdish KRISHNASWAMY, India]	removed
562	63	48	63	49	See also Bittermann et al. (2017), Jackson et al. (2018), Rasmussen et al. Also note that GMSL rise projections are discussed multiple times through the chapter, and should be made consistent and probably streamlined. [Robert Koppu, United States of America]	not anymore applicable to this shortened version
3806	64	1	64	4	year missing for Fischer citation [Olaf Eisen, Germany]	Accepted - Year of publication was added
7578	64	1	64	1	(Fischer 1 et al.), public. Year missing [Jens Zinke, Germany]	Accepted - Year of publication was added
21910	64	1			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Year of publication was added
40250	64	1	64	4	the year of the referece "Fischer et al.: is missed [Amal Hussein, Egypt]	corrected
39836	64	3	64	4	I suggest to check the content of this two lines. [Hernan Edgardo Sala, Argentina]	removed
39838	64	6	64	6	Delete "[END BOX 3.4 HERE]". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
3600	64	9	65	18	This section is very descriptive and does not provide projections. I guess some text could be removed and replaced by projection results. [David Docquier, Belgium]	Accepted: rewritten
29476	64	9	65	18	There are some parts which are tough to follow. For example, please rewrite some parts of the text in L1-4P65. [Joan A. Lopez-Bustins, Spain]	Accepted: We have rewritten parts of the section to improve clarity.
12046	64	11	64	20	Rephrase for conciseness: "Ocean chemistry (such as pH, salinity, or oxygen concentrations) is fundamentally important to marine ecosystems, and is influenced by a range of factors such as precipitation/evaporation, river runoff, coastal erosion, upwelling, ice formation, and biological activity (Stocker et al 2013). It is virtually certain that it is changing under the influence of human activities (Stocker 2013, Rhein 2013)..." [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised
16146	64	11	64	20	Factors given are not the most important ones- chemical redistribution due to changes in ocean circulation, stratification and bgc cycling along with the heat and anthropogenic carbon update are. [Australia]	Accepted: our intention in describing changes in ocean acidification has been cast very much in the lens of the 1.5°C issue. We do not intend to undertake a comprehensive analysis and consensus as the special report SROCC is intending to do that.
16148	64	11	64	23	This section needs a rewrite for accuracy and readability. Rewrite as : " Ocean chemistry includes pH, salinity, oxygen and other chemical properties, and is fundamentally important to marine organisms and ecosystems. It is influenced by factors such as carbon dioxide exchanfe with ther atmosphere, precipitation, evaporation, river runoff, coastal erosion, up-welling, ice formation, and the activities of organisms and ecosystems (Stocker et al., 2013). Despite these many influences, proxies indicate that ocean chemistry was relatively stable for long periods of time prior to the start of the Industrial Period (Hönisch et al., 2012). Ocean chemistry is changing under the influence of human activities (virtually certain; Stocker et al. 2013; Rhein et al. 2013). Around 30% of CO2 emitted by human activities, for example, has been absorbed by the ocean where it combines with water to carbonic acid whose dissociation drives ocean acidification (Cao et al., 2007; Stocker et al., 2013). These changes have resulted in a decrease in ocean pH of more than 0.1 pH units (~30% incrase in acidity, as expressd as the concentration of hydrogen ions) since the Pre-Industrial Period. The flux of CO2 into the ocean has also increased acidity and has decreased that of carbonate ions by 30% (Cao and Caldeira, 2008; Stocker et al., 2013) which is well outside preindustrial variability (Pörtner et al., 2014a): [Australia]	Accepted: the section as been rewritten
39854	64	11	64	11	Add "concentrations" before the comma in: "and a number of specific ions," [Hernan Edgardo Sala, Argentina]	Accepted: this will be picked up in the editing of the manuscript.
54642	64	11	64	11	Replace 'a number of specific ions ' by 'major anions and cations defining salinity and alkalinit; dissolved gases including CO2 and N2O; essential nutrients like nitrate, phosphate, a number of metals, dissolved and particulate organic compounds". This will give a more complete view of ocean chemistry affected by climate change. [Nadine Le Bris, France]	Accepted - Text was revised
13874	64	13	64	13	upwelling. Please check the rest of the documents which have the same typo. [Raden Dwi SUSANTO, United States of America]	Editorial - copyedit to be completed prior to publication
54646	64	13	64	13	'activity of ecosystem' is improper. Replace by 'ecosystem functions' (include all processes that drives the chemical reactions out of equilibrium making the structure of energy and matter flows in ecosystems). [Nadine Le Bris, France]	Accepted - Ocean chemistry includes pH, salinity, oxygen, CO2, and a range of other ions and gases, which affected by precipitation, evaporation, storms, river run-off, coastal erosion, up-welling, ice formation, and the activities of organisms and ecosystem functions (Stocker et al., 2013).
12044	64	14	64	15	This statement is a huge generalisation. The Hönisch 2012 paper discusses only ocean acidication on multi-million year timescales and is probably not the most relevant reference here if you are discussing other aspects of ocean chemistry too (which seems to be the case). There have been regional changes in various aspects of ocean chemistry on much shorter timescales e.g. over the deglaciation there were changes in salinity and the carbonate system in various ocean basins especially in the North Atlantic, Southern Ocean and North Pacific, and the Mediterranean has experienced multiple deep water anoxia events throughout the Pleistocene and the Holocene. Add in nuance or remove sentence completely. [United Kingdom (of Great Britain and Northern Ireland)]	We accept the premise that there is additional nuances to this statement. For reasons of space (we have been asked to shorten the chapter by almost 50%), we have reflected the consensus of AR5. The additional nuances of this issue will almost certainly be the subject of SROCC (which focuses on oceans).
28316	64	14	64	14	long periods of time should please be explained in more detail here (centuries, millennia, geological timescales?). [Germany]	Accepted: it is explained at the end of paragraph.
29694	64	14	64	15	Ocean chemistry is not really stable and some parameters (oxygen, pH, nutrients ...) varies strongly over space and time. Terms lack of precision - does this sentence refer to average conditions at global scale (i.e. oxygen concentration averaged over all water masses)? Overall the assessed stability depends on the considered resolution. The finer it is, the more instable the system will appear. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted: However, we have discussed the influence of other factors on ocean acidification elsewhere in this section.
29696	64	14	64	15	It may be relevant to use the categories developed in Bopp et al. 2013 (including the distinction of intermediate waters, deep water) not just refer to surface waters, even though surface ocean processes are better known and can be specifically highlighted. Vertical stratification of the water column is crucial to refine the assessement of its physical parameters, chemical composition, and of their stability. (Nadine Le Bris) [Antoine PEBAYLE, France]	Due to space, we have limited our discussion of details such as these with the expectation that these issues will be further explored by SROCC.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
37152	64	14	64	15	Ocean chemistry is not really stable and some parameters (oxygen, pH, nutrients ...) varies strongly over space and time. Terms lack of precision - does this sentence refer to average conditions at global scale (i.e. oxygen concentration averaged over all water masses)? [Françoise Gaill, France]	Accepted: this is discussed in different part of the section. Due to limitations on space, we have reduced our discussion to those mentioned. We anticipate that these issues will be further explored by SROCC, which focuses on the ocean.
37154	64	14	64	15	It may be relevant to use the categories developed in Bopp et al. 2013 including the distinction of intermediate waters, deep water, and not just refer to surface waters, [Françoise Gaill, France]	Due to space, we have limited our discussion of details such as these with the expectation that these issues will be further explored by SROCC.
21912	64	15			Remove double space between "start of" [LUIS VALDES, Spain]	Not applicable - This sentence was rewritten
54650	64	18	64	18	Replace 'dilute acid' by 'weak acid' [Nadine Le Bris, France]	We have retained dilute acid - as you can use both terms if need be.
39840	64	19	64	19	Consider to delete "units" in "more than 0.1 pH units", because pH is dimensionless. [Hernan Edgardo Sala, Argentina]	Accepted. Editorial copyedit to be completed prior to publication
17422	64	20	64	20	Incomplete paragraph break [David Schoeman, Australia]	Not applicable - This section was rewritten
21914	64	20			insert space between lines 20 and 21 [LUIS VALDES, Spain]	Not applicable - This section was rewritten
125	64	21	64	21	increasedthe to be changed "increased the" [teodoro georgiadis, Italy]	Not applicable - This section was rewritten
6604	64	21	64	21	increasedthe' should be 'increased the' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7580	64	21	64	21	...increased the.. [Jens Zinke, Germany]	Not applicable - This section was rewritten
10754	64	21	64	21	Change to 'has also increased the concentration of protons…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
21916	64	21			insert space between "increasedthe" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
29698	64	21	64	30	Precisions on change in carbonate chemistry may be needed. It is of primary importance for the biosphere. Aragonite saturation leads to higher energy demand for calcifying organisms. It would be good to mention that aragonite or calcite saturation coefficient reflects both carbonate ion and calcium ion concentrations. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted but due to space limitations discussion of these aspects has been limited.
29700	64	21	64	30	Salinity changes (due to precipitation or river flood, or to evaporation) will therefore modify the coefficient and add to acidification due to anthropogenic CO2 dissolution in seawater. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted: we have discussed these influences on overall ocean acidification states.
35112	64	21	64	21	The spacing is missing among the words "increasedthe" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
37156	64	21	64	30	Salinity changes -due to precipitation, river flood or evaporation- will therefore modify the coefficient and add to acidification due to anthropogenic CO2 dissolution in seawater. [Françoise Gaill, France]	Accepted: we have discussed these influences on overall ocean acidification states.
39842	64	21	64	21	Insert space in "increasedthe". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44414	64	21	64	29	Spacing issue in 4 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
44968	64	21	64	21	increasedthe-->increased the [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
56802	64	21	64	21	Missed a space after "… increased.." [Xiaolin Zhang, China]	Not applicable - This section was rewritten
46026	64	23	64	26	This is not confident. Hönisch et al wrote: Because of the lack of open-ocean sediments and increasingly poor temporal and spatial resolution of the geological record further back in time, it is difficult to place adequate constraints on the duration and rate of CO2 release. Furthermore she wrote: Even for the well studied PETM, the duration of the main phase having excellent potential as analog events of this carbon injection is still debated'. On top of this the variability of the reconstriucted pCO2 are large. [Tim Rixen, Germany]	We are reflecting the consensus of AR5 and assigned confidence levels.
21918	64	24			Remove double space between "event within" [LUIS VALDES, Spain]	Not applicable - This sentence was rewritten
16150	64	28	64	29	Change citation - Guivarch, C., Tachiiri, K., Jones, C. D., Ciais, P. and Gasser, T.: Negative emissions physically needed to keep global warming below 2, Nature Communications, 6, 1–7, doi:10.1038/ncomms8958, 2015. and Mathesius, S., Hofmann, M. and Caldeira, K.: Long-term response of oceans to carbon dioxide removal from the atmosphere, Nature Climate Change, 1–55, 2015. [Australia]	It was not identified why the references needed to be changed.
9248	64	29			Please change "2012).Consequently" to "2012). Consequently" [Marco Turco, Spain]	Not applicable - This sentence was rewritten
39844	64	29	64	29	Insert space after the point in "2012).Consequently". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
16152	64	32	64	32	For Ocean Acidification the first order change is due to rising CO2 levels in the atmosphere and the most immediate impact is how the ocean uptake of this carbon changes the upper ocean chemistry . Suggest discussing this issue since it can easily be related to the future trajectory of atmospheric co2, which drives the warming scenario. Cite one of the following papers on the topic. McNeil, B. I. and Sasse, T. P.: Future ocean hypercapnia driven by anthropogenic amplification of the natural CO2 cycle, Nature, 529(7586), 383–386, doi:10.1038/nature16156, 2016. Sasse, T. P., McNeil, B. I., Matear, R. J. and Lenton, A.: Quantifying the influence of CO 2 seasonality on future ocean acidification, Biogeosciences, doi:10.5194/bgd-12-5907-2015, 2015. Hauri, C., Friedrich, T. and Timmermann, A.: Abrupt onset and prolongation of aragonite undersaturation events in the Southern Ocean, Nature Climate Change, doi:10.1038/nclimate2844, 2015. [Australia]	Accepted: we anticipate that this issue will be discussed in greater detail in SROCC. In this section we are establishing the relevant consensus as regards social acidification and the issue of 1.5°C.
16154	64	32	64	42	The massive disparity between pH change from acidification (tenths of unit) and pH change from runoff and photosynthesis (particularly from SAV - multiple pH units) in coastal and estuarine waters needs to be emphasised to clarify that little is understood about acidification impacts in estuaries against a background of order of diurnal magnitude larger changes. This becomes critical when the proortion of population relying on estuarine and coastal waters is taken into account. [Australia]	Due to space, we have not been able to cover the entire set of nuances concerning coastal influences on ocean acidification. We felt that it is important to add a brief discussion of these issues but due to space, we have not been all inclusive of that information. That is the anticipated role and focus of SROCC which has building a consensus on one change in the oceans and its core.
39846	64	34	64	34	Please, check what is "3.1.8". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised
39848	64	38	64	38	Insert space after the point in "Duarte et al., 2013).Ocean...". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
39850	64	40	64	40	If "Al" refers to Aluminium, consider to use the full word instead of the chemical symbol. [Hernan Edgardo Sala, Argentina]	We are referring to aluminium - if possible in editing, and full word rather than simple (i.e. Al)
7582	64	44	64	44	...concentration of… [Jens Zinke, Germany]	Not applicable - This sentence was rewritten
10756	64	44	64	44	Change to 'The oxygen concentration of seawater is another…' [Franklin Paredes, Brazil]	Not applicable - This sentence was rewritten
44416	64	44	64	49	Spacing issue in 3 places [Rita Man Sze Yu, China]	Not applicable - This sentence was rewritten
44970	64	44	64	44	concentrationof-->concentration of [Hiroaki Kondo, Japan]	Not applicable - This sentence was rewritten
56804	64	44	64	44	Missed a space after "..concentration.." [Xiaolin Zhang, China]	Not applicable - This sentence was rewritten
21920	64	48			insert space between "Gedan(2015)" [LUIS VALDES, Spain]	Not applicable - This sentence was rewritten
39852	64	48	64	48	Insert space before opening parenthesis in "Gedan(2015)". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17424	64	49	64	49	In my opinion, when used as a modifier for "rise" "sea level" should be hyphenated: "sea-level rise". Within this report, I see three versions: "sea level rise", "sealevel rise" and "sea-level rise". Please resolve throughout. Same for "hotspot". [David Schoeman, Australia]	Accepted - Text was revised to ensure consistency throughout the report
56806	64	49	64	49	Missed a space after "…sea…" [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
29352	65		65		In chapter 3.3.12 a Global synthesis is provided that is an excellent summary of the previous subchapters of the report. However, in the case of temperature, precipitation and droughts there are also Summary sections (3.3.2.3, 3.3.3.3 and 3.3.4.3) with the same information that are also included in the corresponding chapter. I would suggest to avoid the repetition of the same sentences so many times. [Borbala Galos, Hungary]	Accepted: rewritten
3598	65	1			Remove bracket. [David Docquier, Belgium]	Accepted - Text was revised
17426	65	1	65	10	This whole paragraph needs careful editing. [David Schoeman, Australia]	Accepted - Text was revised
56808	65	1	65	1	Missed a half bracket [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
61880	65	1	67	5	Again lots of repetition. Do not cite references in summary of key conclusions. Use IPCC calibrated language to report conclusions of the assessment traceable to subsections. [Valérie Masson-Delmotte, France]	Accepted. Section was revised and findings are summarized in a table.
39976	65	2	65	4	Dead zones are where oxygen has fallen below levels that fail to sustain oxygenic life and aredoublingin frequency (risk) every decade (Diaz and Rosenberg, 2008). That is a definition of hypoxia, not a dead zone. Also, state the standard level of hypoxic water such as <=2 mg/l (frm EPA) [Adi Nugraha, United States of America]	Accepted.
7584	65	3	65	3	...and are doubling in frequency… [Jens Zinke, Germany]	Not applicable - This sentence was rewritten
10758	65	3	65	3	Change to 'oxygenic life and are doubling in frequency…' [Franklin Paredes, Brazil]	Not applicable - This sentence was rewritten
21922	65	3			insert two spaces between "aredoublingin" [LUIS VALDES, Spain]	Not applicable - This sentence was rewritten
39856	65	3	65	3	Separate "aredoublingin". [Hernan Edgardo Sala, Argentina]	Not applicable - This sentence was rewritten
44972	65	3	65	3	aredoublingin--> are doubling in [Hiroaki Kondo, Japan]	Not applicable - This sentence was rewritten
50940	65	3	65	3	...and are doubling in frequency... instead of "...and aredoublingin frequency.." [Amjad Masood, Pakistan]	Not applicable - This sentence was rewritten
21924	65	4			insert space between "factors(Altieri" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
39858	65	5	65	5	Insert space before the opening parenthesis in "factors(Altieri" [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
44418	65	5	65	5	other factors(Altieri and Gedan, 2015) [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
56344	65	5	65	5	Change "coastline" to "coastlines". [Annika Herbert, Australia]	Not applicable - This text was deleted
56810	65	5	65	5	Missed a space after "…factors.." [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
51002	65	7	113	8	more than > 60, please remove ">" [Fatima Driouech, Morocco]	Editorial - copyedit to be completed prior to publication
56346	65	9	65	9	Change to: "decreased in salinity". [Annika Herbert, Australia]	We feel that the sentence reads okay as it is.
54654	65	10	65	10	Add 'Change in deep water pH have already been recorded in several ocean regions (M. Gehlen et al., Biogeosciences 11, 6955–6967 (2014); Byrne RH, Mecking S, Feely RA, Liu X. 2010. Direct observations of basin-wide acidification of the North Pacific Ocean: pH CHANGES IN THE NORTH PACIFIC. Geophysical Research Letters 37(2): L02601. doi: 10.1029/2009GL040999).These changes occur at depth where conditions are closer to aragonite and calcite saturation thresholds, place at risk calcifying organisms like cold water coral and all species living on their dead remains forming carbonate substrates (Georgian, S. E., Deleo, D., Durkin, A., Gomez, C. E., Kurman, M., Lunden, J. J.,et al. (2016a). Oceanographic patterns and carbonate chemistry in the vicinity of cold-water coral reefs in the Gulf of Mexico: implications for resilience in a changing ocean. Limnol. Oceanogr. 61, 648–665. doi: 10.1002/lno.10242). [Nadine Le Bris, France]	Accepted: thank you for the reference.
29702	65	14	65	18	There are distinct regional patterns in stressor combination and distinct relation to T°C change, with large decreases in O2 and in pH in global ocean intermediate and mode waters (compared to surface waters) in addition to distinct geographical patterns (Bopp et al. 2013). (Nadine Le Bris) [Antoine PEBAYLE, France]	Thank you very much for the information. We have tried as much as possible to include detailed material. This task has been difficult due to the fact that space is limited and the focus of our reporters on 1.5°C. Anticipate many of these important points and details will be picked up by the ocean focused SROCC report.
37158	65	14	65	18	There are distinct regional patterns in stressor combination and distinct relation to T°C change, with large decreases in O2 and in pH in global ocean intermediate and mode waters (compared to surface waters) in addition to distinct geographical patterns (Bopp et al. 2013). [Françoise Gaill, France]	Accepted: anticipate that this will be discussed by SROCC
54658	65	15	65	15	Levin and Le Bris 2015 (Levin LA, Le Bris N. 2015. The deep ocean under climate change. Science 350(6262): 766–768. doi: 10.1126/science.aad0126) have inventoried the changes that affect the deeper layers of the ocean and the ocean floor and discussed related hazards. Although less documented than for surface waters, ecosystems at depth > 200m already experience increasing combinations of climate stressors. These changes occur are expected to have highest impacts in areas already lower in oxygen and higher in CO2 than those of the ocean surface, with some extreme cases encountered at the fringe of dead zones or regions of the seafloor already understaturated with respect to aragonite and calcite. Projection of models identify several hotspots of biodiversiy and ecosystem servicesthat will be impacted by the end of the century (Mora et al. 2013; Sweetman et al. 2017). Exposure of the world's oceans to co-occurring changes in ocean biogeochemistry to the year 2100 exceed 80% of the seafloor for all climate stressors (Mora et al. 2013). (Mora C, Wei C-L, Rollo A, Amaro T, Baco AR, Billett D, Bopp L, Chen Q, Collier M, Danovaro R, et al. 2013. Biotic and Human Vulnerability to Projected Changes in Ocean Biogeochemistry over the 21st Century. Mace GM, editor. PLoS Biology 11(10): e1001682. doi: 10.1371/journal.pbio.1001682; Sweetman AK, Thurber AR, Smith CR, Levin LA, Mora C, Wei C-L, Gooday AJ, Jones DOB, Rex M, Yasuhara M, et al. 2017. Major impacts of climate change on deep-sea benthic ecosystems. Elem Sci Anth 5(0): 4. doi: 10.1525/elementa.203). [Nadine Le Bris, France]	Accepted: thank you for the references. Most of the references have been added in section 3.4.4.6
46724	65	16	65	16	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted: we have systematically gone through the manuscript and have inserted conference language where appropriate and have sought to use alternative language in the case where an assessment is not being made via the formal guidelines of the IPCC.
29478	65	17	65	17	Please substitute "an" with "and". [Joan A. Lopez-Bustins, Spain]	Not applicable - This sentence was rewritten
39860	65	17	65	17	Replace "an" by "and". [Hernan Edgardo Sala, Argentina]	Not applicable - This sentence was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
46726	65	17	65	17	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted: we have systematically gone through the manuscript and have inserted conference language where appropriate and have sought to use alternative language in the case where an assessment is not being made via the formal guidelines of the IPCC.
16156	65	18	65	19	OA initimately linked to anthropogenic CO2 emissions with reduced emissions reduce OA. Also a positive carbon climate feedback will increase co2 in the atmosphere and accelerate OA (Matear, R. J. and Lenton, A.: Carbon-climate feedbacks accelerate ocean acidification, Biogeochemistry Discussion, submitted, 1–23, 2017.) [Australia]	Accepted: However, many of these details go beyond the remit of the current report. We anticipate that carbon feedbacks and their effect on ocean acidification will be picked up by the much more ocean focused SROCC report.
1408	65	23	67	5	The fact that there is a summary of a subsection with still more new information just raises the question: what have the chapter lead authors been doing to discipline the writing team? Maybe all that is needed is an extended summary with a few good figures? [Karen Olsen, Denmark]	Not applicable - section completely rewritten.
6224	65	23	67	5	The fact that there is a summary of a subsection with still more new information just raises the question: what have the chapter lead authors been doing to discipline the writing team? Maybe all that is needed is an extended summary with a few good figures? [Anne Olhoff, Denmark]	Not applicable - section completely rewritten.
9714	65	23	68	37	Global synthesis 3.3.12: The subsection should be very brief since it merely summarizes the sections 3.3.1 to 3.3.11. The subsection is currenly about 3 pages -- so this an area to think of cutdown. [Mustafa BABIKER, Sudan]	Accepted. Section was revised and findings are summarized in a table.
18314	65	23	67	5	The fact that there is a summary of a subsection with still more new information indicates that the subsection is too long, and that it should be possible to produce a shorter section highlighting the key points. [Andrea TILCHE, Belgium]	Not applicable - section completely rewritten.
3602	65	26			Add 's' at the end of 'change'. [David Docquier, Belgium]	Not applicable - This section was rewritten
21926	65	29			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
41372	65	29	65	32	What is meant by exaggerated effect on regional land-based heat extremes? [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
44420	65	29	65	42	Spacing issue in 3 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
62412	65	29	65	29	Please verify this reference "Seneviratne et al.,"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
32506	65	30	65	30	Matthew et al., citation missing year, [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
21928	65	33			Move the citation (Vogel et al., 2017) at the end of the sentence (after "cooling") [LUIS VALDES, Spain]	Not applicable - This section was rewritten
41374	65	35	65	42	Can it be revised to make it consistent? It jumps from one point to another and appears as a review. [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
41376	65	37			Refrain from saying published literature. [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
41378	65	37	65	38	all cities? [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
56812	65	37	65	37	2.0oC instead of "2.0 C"? [Xiaolin Zhang, China]	Not applicable - This section was rewritten
28318	65	38	65	38	deadly heatwaves should please be explained. [Germany]	Not applicable - section completely rewritten.
39862	65	38	65	38	I suggest to use "heat-waves" instead of "heatwaves" to keep consistency along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised to ensure consistency throughout the report
21930	65	39			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
40256	65	39	65	42	the year of the reference "Mitchell et al." is missed [Amal Hussein, Egypt]	Not applicable - section completely rewritten.
41380	65	39	65	40	which megacities? [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
41484	65	39	65	39	Here the term "Megacities" has appeared. We had better to focus more on the megacities, because it become one of the main theme in the developing countries in the tropic to sub-tropic regiona. Are there no paper handling such theme? [Izuru Takayabu, Japan]	Not applicable - This section was rewritten
62414	65	39	65	39	Please verify this reference "Mitchell et al.)"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
56814	65	40	65	40	2.0oC instead of "2.0 C"? [Xiaolin Zhang, China]	Not applicable - This section was rewritten
7586	65	42	65	42	...(Mitchell et al.). public. Year missing [Jens Zinke, Germany]	Not applicable - This section was rewritten
7824	65	42			(Mitchell et al.). What year [Anthony Lupo, United States of America]	Not applicable - This section was rewritten
21932	65	42			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
62416	65	42	65	42	Please verify this reference "Mitchell et al.)"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
7588	65	46	65	46	...Seneviratne et al.),… public. Year missing [Jens Zinke, Germany]	Not applicable - This section was rewritten
21934	65	46			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
40258	65	46	65	46	the year of the reference "Seneviratne et al." is missed [Amal Hussein, Egypt]	Not applicable - section completely rewritten.
57580	65	49	66	4	please provide reference(s) [Hans Poertner, Germany]	Not applicable - section completely rewritten.
41486	66	1	66	7	We wonder if we have enough S/N ratio on discussing the TC activities differences between 1.5 degree and 2.0 degree incrase world. [Izuru Takayabu, Japan]	Not applicable - section completely rewritten.
41382	66	4	66	7	It is suggested that this be another para. [Lourdes Tibig, Philippines]	Not applicable - This section was rewritten
44422	66	4	66	7	Perhaps a new paragraph for tropical cyclones? [Rita Man Sze Yu, China]	Not applicable - section completely rewritten.
7238	66	10	66	30	The summary on land surface makes no mention of the snow cover, which is suprising and could be fixed. [Samuel MORIN, France]	Not applicable - section completely rewritten.
49182	66	10	66	30	For drought there is very little information on sub-saharan Africa and north Africa, and for flooding there is a lot of information on Europe but very little on other parts of the world, e.g. Asia, Latin America [Bill Hare, Germany]	Not applicable - section completely rewritten.
7324	66	11	66	30	The conclusions here seem to be a random choice from 1 article!!! They don't at all represent a consensus from the studies included here. (Or if the authors think they do represent the consensus, this needs to be made much clearer in the section on page 51) [Chantal Donnelly, Australia]	Not applicable - section completely rewritten.
3604	66	12			Typo: 'availability'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6606	66	12	66	12	extremes changes in water vailability' should be 'extreme changes in water availability' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7590	66	12	66	12	...water vailability change to availability [Jens Zinke, Germany]	Not applicable - This section was rewritten
9250	66	12			Please change "vailability" to "availability" [Marco Turco, Spain]	Not applicable - This section was rewritten
17428	66	12	66	12	Replace "extremes" with "extreme". [David Schoeman, Australia]	Not applicable - This section was rewritten
32508	66	12	66	12	Change "vailability" to "availability" [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
39864	66	12	66	12	Typo in "vailability", [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
6608	66	13	66	13	strong inceases in dryness' should be 'strong increases in dryness' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9252	66	13			Please change "inceases" to "inceases" [Marco Turco, Spain]	Not applicable - This section was rewritten
29480	66	13	66	13	Please rewrite "increases". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39866	66	13	66	13	Typo in "inceases". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
9254	66	16			Please change ").Based" to "). Based" [Marco Turco, Spain]	Not applicable - This section was rewritten
39868	66	16	66	16	Insert space after the point in ".Based". [Hernan Edgardo Sala, Argentina]	Not applicable - This section was rewritten
44424	66	16	66	16	Figures 3.15 and 3.16).Based on [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
62418	66	16	66	16	Please widen the space between "3.16).Based" and "Based" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6610	66	18	66	18	differences in decrease between' should be 'differences in decreases between' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
3606	66	20			Typo: 'latitudes'. [David Docquier, Belgium]	Not applicable - This section was rewritten
9256	66	20			Please change "latitides" to "latitudes" [Marco Turco, Spain]	Not applicable - This section was rewritten
10760	66	20	66	20	Change to 'northern high latitudes, and parts of India,…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
29482	66	20	66	20	Please rewrite "latitudes". [Joan A. Lopez-Bustins, Spain]	Not applicable - This section was rewritten
56816	66	20	66	20	latitude instead of "latitides"? [Xiaolin Zhang, China]	Not applicable - This section was rewritten
21936	66	21			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
57064	66	24	66	25	no meaning [AMANDINE PASTOR, France]	Not applicable - section completely rewritten.
3608	66	25			Remove 'other' before 'the'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6612	66	25	66	25	although other the picture for other' should be 'although the picture for other' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7592	66	25	66	25	...although other the picture remove other [Jens Zinke, Germany]	Not applicable - This section was rewritten
17430	66	25	66	25	Delete one instance of "other" [David Schoeman, Australia]	Not applicable - This section was rewritten
18316	66	25	66	27	Although not specified the text suggests that this statement is about 1.5°C warming, yet the study of Roudier et al. (2016) focusses on 2°C warming only. [Andrea TILCHE, Belgium]	Not applicable - section completely rewritten.
30472	66	25	66	27	Please note that this is for a +2C scenario [France]	Not applicable - section completely rewritten.
56348	66	25	66	25	Remove "other". [Annika Herbert, Australia]	Not applicable - This section was rewritten
56818	66	25	66	25	although the other.. instead of "although other the.."? [Xiaolin Zhang, China]	Not applicable - This section was rewritten
3610	66	27			Remove 'While' before 'at'. [David Docquier, Belgium]	Not applicable - This section was rewritten
9258	66	27			Please change ").While" to "). While" [Marco Turco, Spain]	Not applicable - This section was rewritten
9386	66	28	66	29	Incorrect interpretation - Chadburn considers equilibrium response or committed response of permafrost at stabilization. These changes in permafrost will not occur by 2100 (which is when projected air temperature change will occur) but will take somewhat longer time to occur (due to lag effects). [Sharon Smith, Canada]	Not applicable - section completely rewritten.
34046	66	28	66	30	This statement does not say to which year it compares to, is it 1960-1990? "Present" can be interpreted as a vague term. Also, is the 35-47% decrease for 2C warming, or compared to another time frame?Please consider to clarify this. [Norway]	Not applicable - section completely rewritten.
39870	66	28	66	30	It seems that this sentence is not complete: "By 2100, the area of Arctic permafrost is expected to decline by 21–37% in a 1.5ºC world and 35–47% relative to the present (Chadburn et al., 2017)." Probably, "in a 2ºC world" should be added inmediatly before "relative to the present". [Hernan Edgardo Sala, Argentina]	Not applicable - section completely rewritten.
6614	66	29	66	29	decline by 21–37% in a 1.5ºC world and 35–47%' should be 'decline by 21–37% in a 1.5ºC world and 35–47% in a 2.0ºC world' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
55792	66	29			This is relative to 1960-1990 and not relative to present day. [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - section completely rewritten.
6616	66	37	66	37	factors varies as' should be 'factors varies as a' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10408	66	39	66	45	this sounds contradictory aaas one sentence says there are tipping points and the next says there aren't [Christopher Reyer, Germany]	Not applicable - section completely rewritten.
34048	66	39	66	45	In line 39-41, seasonally ice-free Arctic is given as an example of a tipping point, in contrast to line 44-45 (and other parts of the report) that suggests that it is not. [Norway]	Not applicable - section completely rewritten.
39872	66	39	66	45	This part of the paragraph seems a bit confusing to me, because lines 39 and 40 state: "There is clear evidence and concern that some of these changes involve tipping points that have been reached...", but later, lines 43 and 44 say: "Studies do not find evidence of irreversibity or tipping points..." So, I wonder if there are (or not) tipping points concerning the spatio-temporal distribution of Artic sea-ice. [Hernan Edgardo Sala, Argentina]	Not applicable - section completely rewritten.
43024	66	39	66	45	Empirical observations show continuing rapid decline of Arctic sea ice. National Snow and Ice Data Center, Sea ice hits record lows (6 December 2016) (“Through 2016, the linear rate of decline for November is 55,400 square kilometers (21,400 square miles) per year, or 5.0 percent per decade.”); Perovich D., Meier W., Tschudi M., Farrell S., Hendricks S., Gerland S., Haas C., Krumpen T., Polashenski C., Ricker R., & Webster M. (2017) Sea Ice, in ARCTIC REPORT CARD 2017 (“Based on estimates produced by the National Snow and Ice Data Center (NSIDC) Sea Ice Index (Fetterer et al., 2002), the sea ice cover reached a maximum extent of 14.42 million km2 on March 7, 2017. This was 8% below the 1981–2010 average. For the third straight year, the Arctic sea ice has experienced a new record lowest maximum value in the satellite record. The maximum extent occurred 5 days earlier than the 1981–2010 average (12 March).”); see also National Snow and Ice Data Center (NSIDC) Arctic sea ice maximum at record low for third straight year (22 March 2017) (“Arctic sea ice appears to have reached its annual maximum extent on March 7. This is the lowest maximum in the 38-year satellite record. NSIDC will post a detailed analysis of the 2016 to 2017 winter sea ice conditions in our regular monthly post in early April.”). Specify number of years to define the timescale of reversibility. [Durwood Zaelke, United States of America]	Not applicable - section completely rewritten.
54662	66	39	66	39	Add reference (Sweetman AK, Thurber AR, Smith CR, Levin LA, Mora C, Wei C-L, Gooday AJ, Jones DOB, Rex M, Yasuhara M, et al. 2017. Major impacts of climate change on deep-sea benthic ecosystems. Elem Sci Anth 5(0): 4. doi: 10.1525/elementa.203) [Nadine Le Bris, France]	Not applicable - section completely rewritten.
62720	66	40	66	41	This is an instance of internal inconsistency within the chapter. The inference is that sea-ice will cross a tipping point between 1.5 and 2C. However, in section 3.5.6.1 it is clear that there is no evidence for a bifurcation or tipping point. The entire chapter must be carefully checked for such inconsistencies as these will seriously undermine the perceived quality of the assessment. [Greg FLATO, Canada]	Not applicable - section completely rewritten.
6618	66	42	66	42	mainatained' should be 'maintained' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40260	66	42	66	42	mainatained ----> corrected to maintained [Amal Hussein, Egypt]	Not applicable - This section was rewritten
46728	66	42	66	42	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - section completely rewritten.
21938	66	43			add "year" in citation or delete the reference (three cases in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
62420	66	43	66	43	Please verify these references (Jahn; Niederdrenk and Notz; Ridley and Blockley; [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6620	66	44	66	44	could return with' should be 'could return within' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
56350	66	44	66	44	Change "with" to "within"? [Annika Herbert, Australia]	Not applicable - This section was rewritten
49184	66	47	67	5	Should this summary on GMSL say more on long-term committed GMSL rise? There is a statement about SLR in 2100, and a statement about the existence of committed GMSL, but no quantitative information. [Bill Hare, Germany]	Not applicable - section completely rewritten.
17432	66	49	66	49	Move "world" to after "1.5°C". [David Schoeman, Australia]	Not applicable - This section was rewritten
62422	66	49	66	49	Please verify this reference "Nicholls et al.;"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
29736	67		68		Information on « tipping points » is everywhere. It would be interesting to group the parties dealing with tipping point and introduce the definition at the very beginning of the part. It would enable to avoid many repetitions. [Capucine Pagniez, France]	Noted – the discussion on tipping points has been consolidated in the FGD, in particular box 6.5 has been removed.
35934	67				Box 3.5: Will the South Asian Monsoon undergo an abrupt change under global warming? It may be added that this monsoon system is vital for more than 1 billion people. [India]	Not applicable - section completely rewritten.
35936	67	1	67	5	Frequency of storm surges depend mainly in the changes in MSL (AR5, Chapter 13 section 7) rather the changes in storminess. The differences between the projected sea level rise for 1.5 degree C and 2.0 degree C is small. The statement that ' frequency of large storm surges may be reduced' is based on an isolated study. In IPCC language this statement has low confidence. This statement needs to be written with caution. [India]	Not applicable - section completely rewritten.
61882	67	1	68	38	Please do not speculate at the beginning of the box and build on the AR5 (WGI on abrupt change, chapter 5 - paleo and chapter 12 - projections, and WGII). Introduce defintiions of abrupt change and tipping points. Title should be revised (twice "climate"). Lack of introduction to the methods in AR5 WGI (evidence from paleo, climate model simulations). For ice sheets, check consistency with chapter 3 assessment. The timescale for sea level rise should be very explicit (2100, 2300 or longer time scales). I suggest not to build on Lenton (2008) but start from what was assessed in the AR5 WGI&WGII and focus on new findings (here mostly from the analysis of CMIP5 models in Drifjhout et al 2005). There is a confusion between three aspects in the box (what can cause abrupt change and under which conditions, or tipping elements; thresholds and "tipping points"; and irreversibility. I suggest to focus on risks of abrupt and irreversible changes, as there is new evidence. In fact, I can see very little insight on thresholds (or tipping points). For biomes, there are a number of related uncertainties, such as the response of biomes to changes in atmospheric CO2 concentration which are not assessed here at all (a core topic for the special report on land underway), so cautiousness is really needed in this assessment. The summary is not an assessment of confidence in methods and tools (including the fit for purpose of models) and does not use the IPCC calibrated language. This box needs work to have the quality standards of IPCC reports. Note that the special report SROCC will have a chapter on abrupt change, and I encourage the authors of this chapter to interact with the authors of this chapter to ensure coherency of the assessment. [Valérie Masson-Delmotte, France]	Not applicable- Box 3.5 was deleted
3808	67	2	67	2	year missing for Rasmussen citation [Olaf Eisen, Germany]	Not applicable - This section was rewritten
7594	67	2	67	2	...(Rasmussen et al.). public. Year missing [Jens Zinke, Germany]	Not applicable - This section was rewritten
32510	67	2	67	2	Rasmussen et al. citation missing year, [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
44426	67	2	67	2	Year is missing "(Rasmussen et al.)" [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
3810	67	3	67	4	sentence is unclear, what does exist refer to? [Olaf Eisen, Germany]	Accepted: rewritten
46730	67	3	67	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted - Thank you
16158	67	4	67	4	Add - OA tipping point around 450 ppm with the Arctic tipping being lightly lower (using references listed above or McNeil, B. I. and Matear, R. J.: Southern Ocean acidification: A tipping point at 450-ppm atmospheric CO2, P Natl Acad Sci Usa, 105, 18860–18864, doi:DOI 10.1073/pnas.0806318105, 2008. or add to box 3.5 [Australia]	Discussed, unclear.
39874	67	7	67	7	Delete "[START BOX 3.5 HERE]". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
41384	67	7	68	39	Box 3.5 will be very important for readers [Lourdes Tibig, Philippines]	Not applicable - Box 3.5 was deleted
54700	67	7			start box here and end box here should be omitted [Qudsia Zafar, Pakistan]	Editorial - copyedit to be completed prior to publication
3812	67	9	67	9	Delete, as these not necessarily need to be climate tipping points but others as well, e.g. sea ice could behave as a tipping point , but is it a climate tipping point? [Olaf Eisen, Germany]	Not applicable - Box 3.5 was deleted
3814	67	9	67	9	Delete "climate", as these not necessarily need to be climate tipping pointsmonly but others as well, e.g. sea ice could behave as a tipping point , but is it a climate tipping point? [Olaf Eisen, Germany]	Not applicable - Box 3.5 was deleted
16160	67	9	68	37	There needs to be a better explanation of tipping points here, to reflect they are transitions into states that are themselves stable, and thus difficult to get out of. Also the quesiton of whether we may have already passed any tipping points needs to be here as we are so close to the 1.5C threshold. It is not clear that "abrupt biome shifts" qualify as tipping points if the biome can shift back to its previous state as quickly as out of it. [Australia]	Not applicable - Box 3.5 was deleted
19646	67	9	68	37	a recent analysis of CMIP5 model projections suggests a clustering of abrupt changes in the interval of 1.5–2°C warming (Drijfhout et al., 2015). Section mentions a few climate "tipping points" (like collapse sea-ice; abrupt declines in land-ice-snow; ocean circulation etc), but generally misses on showing which additional tipping points could be reached and positive climate feedback mechanisms triggered in overshoot scenarios vis-a-vis non-overshoot scenarios. Also it is not clear whether reaching these tipping points during overshoot substantially reduces the probability of returning to 1.5C or not by the end of the 21st century. [Jennifer Morgan, Netherlands]	Not applicable - Box 3.5 was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53354	67	9	68	37	Insert discussion of methane clathrates: A positive feedback ("run-away") mechanism has been identified as a potential responsible for past mass-extinction events in planetary history. However the dynamics of the mechanism are still poorly understood. Currently, methane release is already being observed in Arctic waters. Archer, D., & Buffett, B. (2005). Time?dependent response of the global ocean clathrate reservoir to climatic and anthropogenic forcing. Geochemistry, Geophysics, Geosystems, 6(3). [Kjell Kühne, Mexico]	Not applicable - Box 3.5 was deleted
53356	67	9	68	37	Insert a reference to Hansen et al (2008) which suggests that a long-term tipping point for the global climate system may lie at around 350ppm CO2, a value which we have already crossed. A global, long-term commitment to further warming of several degrees may already have been triggered and the fact that the science on understanding the dynamic properties of the global climate system lags behind provides no protection, only uncertainty. Hansen, J., Sato, M., Kharecha, P., Beerling, D., Berner, R., Masson-Delmotte, V., ... & Zachos, J. C. (2008). Target atmospheric CO2: Where should humanity aim?. arXiv preprint arXiv:0804.1126. [Kjell Kühne, Mexico]	Not applicable - Box 3.5 was deleted
564	67	11	67	21	See also the review by Kopp et al. (2016): Kopp, R. E., R. Shwom, G. Wagner, and J. Yuan (2016). Tipping elements and climate-economic shocks: Pathways for integrated assessment. Earth's Future 4, 346–372. doi: 10.1002/2016EF000362. [Robert Koppu, United States of America]	Not applicable - Box 3.5 was deleted
35930	67	11	67	36	The collapse of the monsoon system predicted by Lenton et al(2008) has been shown to be wrong. See Boos and Storelvmo, PNAS, 2016 [India]	Not applicable - Box 3.5 was deleted
53450	67	11	67	11	WG2 should be written as WGII [Seyed Muhammadreza Tabatabaei, Iran]	Not applicable - This box was deleted
53568	67	11	67	11	WG2 should be written as WGII [mahnaz khazaei, Iran]	Not applicable - This box was deleted
57584	67	13	67	13	any more recent literature available? [Hans Poertner, Germany]	Not applicable - Box 3.5 was deleted
10410	67	14	67	14	Omitt "global" as the change in forcing will relate to regional temperature in most cases [Christopher Reyer, Germany]	Not applicable - Box 3.5 was deleted
34050	67	15	67	16	It seems unusual to talk about "...change ... may be in some cases difficult to reverse ..." when discussing tipping points. If a tipping point is reached, by definition the system does not return to its former state, or else it was not a tipping point in the first place. Please consider to explain/clarify this. [Norway]	Not applicable - Box 3.5 was deleted
17434	67	17	67	17	The R in SREX stands for "Report", so no need to repeat it. [David Schoeman, Australia]	Not applicable - This box was deleted
5758	67	23	67	36	Will the South Asian Monsoon undergo an abrupt change under global warming? This may be discussed and clarified here as this monsoon system is vital for more than 1 billion people. [Govindasamy Bala, India]	Not applicable - Box 3.5 was deleted
57630	67	27	67	31	The title of the box specified climate tipping points and here ecological 'tipping points' are discussed. Either keep this box to climate and separate ecological tipping points into a new box, or keep together but ensure a balance between climate and ecological tipping points [Hans Poertner, Germany]	Not applicable - Box 3.5 was deleted
56004	67	28	67	36	Strongly suggest these lines, only somewhat simplified from the verbatim and beginning with "Recent analysis of model projecttions suggests.." also be placed in this chapter's Executive Summary. [Pamela Pearson, United States of America]	Not applicable - Box 3.5 was deleted
3612	67	30			Separate 'sea' and 'ice'. [David Docquier, Belgium]	Not applicable - This section was rewritten
3816	67	30			seaice -> sea ice [Olaf Eisen, Germany]	Not applicable - This section was rewritten
5756	67	30	67	35	Similar to the high latitude regions, high altitude regions such as the Himalaya and Tibet are also very sensitive to climate change. Glacier retreat in the high altitude Himalaya is likely to be irreversible on human timescale. [Govindasamy Bala, India]	Not applicable- Box 3.5 was deleted
6622	67	30	67	30	involve seaice' should be 'involve sea ice' [Robert Shapiro, United States of America]	Not applicable - This box was deleted
7596	67	30	67	30	...involve sea ice… [Jens Zinke, Germany]	Not applicable - This box was deleted
35932	67	30	67	35	Similar to the high latitude regions, high altitude regions such as the Himalaya and Tibet are also very sensitive to climate change. Glacier retreat in the high altitude Himalaya is likely to be irreversible on human timescale. [India]	Not applicable- Box 3.5 was deleted
39876	67	30	67	30	Replace "seaice" by "sea-ice". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
44974	67	30	67	30	seaice-->sea ice [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
42790	67	38	67	43	From 1979 to 2011, Arctic sea ice decreased by 40% and resulted in a decline in albedo such that the change in forcing was equivalent to 25% that of CO2 in the same timeframe. Pistone K., et al. (2014) Observational Determination of Albedo Decrease Caused by Vanishing Arctic Sea Ice, PROC. NAT'L. ACAD. SCI. 111(9):3322–3326, 3325 ("The change in annual-mean global-mean surface temperature is 0.69 °C during 1979–2011…we find that during 1979–2011 the Arctic darkened sufficiently to cause an increase in solar energy input into the Arctic Ocean region of 6.4 ± 0.9 W/m2, equivalent to an increase of 0.21 ± 0.03 W/m2 averaged over the globe. This implies that the albedo forcing due solely to changes in Arctic sea ice has been 25% as large globally as the direct radiative forcing from increased carbon dioxide concentrations, which is estimated to be 0.8 W/m2 between 1979 and 2011. The present study shows that the planetary darkening effect of the vanishing sea ice represents a substantial climate forcing that is not offset by cloud albedo feedbacks and other processes. Together, these findings provide direct observational validation of the hypothesis of a positive feedback between sea ice cover, planetary albedo, and global warming."). [Kristin Campbell, United States of America]	Not applicable- Box 3.5 was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
43026	67	38	67	43	In defining tipping points, reversibility (as is discussed for Arctic sea ice throughout this chapter) does not negate the changing climate regime; even if Arctic sea ice can return, the decreased albedo from the lack of sea ice can still greatly impact the climate system. See Drijfhout et al 2015, Lenton et al 2008, Lenton 2012. Already, from 1979 to 2011, Arctic sea ice decreased by 40% and resulted in a decline in albedo such that the change in forcing was equivalent to 25% that of CO2 in the same timeframe. Pistone K., et al. (2014) Observational Determination of Albedo Decrease Caused by Vanishing Arctic Sea Ice, PROC. NAT'L. ACAD. SCI. 111(9):3322–3326, 3325 ("The change in annual-mean global-mean surface temperature is 0.69 °C during 1979–2011…we find that during 1979–2011 the Arctic darkened sufficiently to cause an increase in solar energy input into the Arctic Ocean region of 6.4 ± 0.9 W/m2, equivalent to an increase of 0.21 ± 0.03 W/m2 averaged over the globe. This implies that the albedo forcing due solely to changes in Arctic sea ice has been 25% as large globally as the direct radiative forcing from increased carbon dioxide concentrations, which is estimated to be 0.8 W/m2 between 1979 and 2011. The present study shows that the planetary darkening effect of the vanishing sea ice represents a substantial climate forcing that is not offset by cloud albedo feedbacks and other processes. Together, these findings provide direct observational validation of the hypothesis of a positive feedback between sea ice cover, planetary albedo, and global warming."); National Snow and Ice Data Center, Sea ice hits record lows (6 December 2016) ("Through 2016, the linear rate of decline for November is 55,400 square kilometers (21,400 square miles) per year, or 5.0 percent per decade."); Perovich D., Meier W., Tschudi M., Farrell S., Hendricks S., Gerland S., Haas C., Krumpen T., Polashenski C., Ricker R., & Webster M. (2017) Sea Ice, in ARCTIC REPORT CARD 2017 ("Based on estimates produced by the National Snow and Ice Data Center (NSIDC) Sea Ice Index (Fetterer et al., 2002), the sea ice cover reached a maximum extent of 14.42 million km2 on March 7, 2017. This was 8% below the 1981–2010 average. For the third straight year, the Arctic sea ice has experienced a new record lowest maximum value in the satellite record. The maximum extent occurred 5 days earlier than the 1981–2010 average (12 March)."); see also National Snow and Ice Data Center (NSIDC) Arctic sea ice maximum at record low for third straight year (22 March 2017) ("Arctic sea ice appears to have reached its annual maximum extent on March 7. This is the lowest maximum in the 38-year satellite record. NSIDC will post a detailed analysis of the 2016 to 2017 winter sea ice conditions in our regular monthly post in early April."). [Durwood Zaelke, United States of America]	Not applicable- Box 3.5 was deleted
3614	67	40			Remove 'twoof'. [David Docquier, Belgium]	Not applicable - This section was rewritten
6624	67	40	67	40	with twoof 37 model' should be 'with two of 37 model' [Robert Shapiro, United States of America]	Not applicable - This box was deleted
7598	67	40	67	40	...with two of 37… [Jens Zinke, Germany]	Not applicable - This box was deleted
10762	67	40	67	40	Change to 'with two of 37 model simulations showing…' [Franklin Paredes, Brazil]	Not applicable - This box was deleted
21940	67	40			insert space between "twoof" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
44976	67	40	67	40	twoof--> two of [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
34052	67	41	67	43	This sentence states that possible changes of sea ice declines include "major ecological shifts". Please consider to give this subject more attention in this box and other relevant subsections and the Executive Summary. [Norway]	Not applicable- Box 3.5 was deleted
6626	67	45	67	45	projectedby' should be 'projected by' [Robert Shapiro, United States of America]	Not applicable - This box was deleted
8042	67	45	67	49	RCM downscaling by Li et al. (2017) found that in a 1.5C warming world, risks of extreme dry events would increase in Northwest China, Tibetan Plateau and NortheastChina (1. 13, 1. 02 and 1. 22 times of that in baseline period). recipitation intensity and extreme wet events would increase significantly over most parts of China: Li Donghuan Zhou Liwei, Zhou Tianjun. Changes of extreme indices over China in response to 1. 5 ? global warming projected by a regional climate model[J]. Advances in Earth Science, 2017,32(4):446-457,doi:10.11867/j.issn.1001-8166.2017.04.0446 [In Chinese with English abstract] [Tianjun Zhou, China]	Not applicable- Box 3.5 was deleted
8044	67	45	67	49	For the Tibetan Plateau, projection employing the pattern scaling method found that when the globe witness a 1.5C warming, the TP would be 0. 69C/0. 75C/0.70C/0.72 warmer than the present (2007-2016) under RCP2.6/4.5/6.0/8.5 scenario:Chen Xiaolong,Zhou Tianjun. 2017. Surface air temperature projection under 1. 5 ? warming threshold based on corrected pattern scaling technique[J]. Advances in Earth Science, 2017,32(4):435-445,doi:10.11867/j.issn.1001-8166.2017.04.0435 [in Chinese with English abstract]. [Tianjun Zhou, China]	Not applicable- Box 3.5 was deleted
9260	67	45			Please change "projectedby" to "projected by" [Marco Turco, Spain]	Not applicable - This section was rewritten
10764	67	45	67	45	Change to 'plateau are projected by some models,…' [Franklin Paredes, Brazil]	Not applicable - This box was deleted
21942	67	45			insert space between "projectedby" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39878	67	45	67	45	Insert space in "projectedby". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
44978	67	45	67	45	projectedby-->projected by [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
62424	67	45	67	45	Please widen the space between "projected" and "by" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This box was deleted
126	67	46	67	46	withtwo t.b.c "with two" and "simulations(" t.b.c. "simulations (" [teodoro georgiadis, Italy]	Not applicable - This box was deleted
3818	67	46			withtwo -> with two [Olaf Eisen, Germany]	Not applicable - This section was rewritten
6628	67	46	67	46	withtwo' should be 'with two' [Robert Shapiro, United States of America]	Not applicable - This box was deleted
9262	67	46			Please change "withtwo" to "with two" [Marco Turco, Spain]	Not applicable - This section was rewritten
10766	67	46	67	46	Change to 'with two related model simulations(out of 37) showing…' [Franklin Paredes, Brazil]	Not applicable - This box was deleted
21944	67	46			insert space between "withtwo" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39880	67	46	67	46	Insert space in "withtwo". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
39882	67	46	67	46	Insert space before the opening parenthesis in "simulations(out of 37)". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
44980	67	46	67	46	withtwo-->with two [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
62426	67	46	67	46	Please widen the space between "simulations" and "(out of 37)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This box was deleted
39884	67	47	67	47	I suggest to use "heat-waves" instead of "heatwaves" to keep consistency along this chapter and across chapters. [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
9388	67	48	67	49	Is this change in permafrost for the global permafrost regions, Arctic? Also be clear that this is committed or equilibrium response. [Sharon Smith, Canada]	Not applicable- Box 3.5 was deleted
46022	67	48	67	48	Reference (Xiao and Duan, 2016) is missing [Tim Rixen, Germany]	Not applicable - This box was deleted
34054	67	49	67	49	The numbers does not seem to match with what is written on page 53 lines 16-17., the average is odd, but it refers to the same work of Chadburn et al, 2017. Please check for consistency. [Norway]	Not applicable- Box 3.5 was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
13876	68	4	68	10	Concentrate only in the Atlantic ocean. How about ocean circulation in the Indian, Pacific and Southern Oceans? Please add. [Raden Dwi SUSANTO, United States of America]	Not applicable- Box 3.5 was deleted
3616	68	5			Add 'of this potential collapse' after 'Consequences'. [David Docquier, Belgium]	Not applicable - This box was deleted
56352	68	5	68	5	Change "observation" to "geological". [Annika Herbert, Australia]	Not applicable - This box was deleted
60384	68	7	68	7	The reference to Yin et al., 2009 (page 3-68, line 7) is missing from the chapter references on p. 3-247. [United States of America]	Not applicable - This box was deleted
9264	68	9			Please change ").The" to "). The" [Marco Turco, Spain]	Not applicable - This box was deleted
60386	68	9	68	10	The assertion that "The AMOC may be systematically biased to be too stable in current models (Liu et al., 2017)" needs to be substantiated. Liu et al. (2017) does not appear to be in the reference list. This specific claim is not sufficiently supported by the vast literature on AMOC to justify inclusion in an IPCC report. [United States of America]	Not applicable- Box 3.5 was deleted
13516	68	10	68	10	separate CO2emissions [Sergio Aquino, Canada]	Not applicable - This box was deleted
3620	68	12	68	13	Rephrase: 'Observations show major ice losses in both the Greenland and West Antarctic Ice Sheets'. [David Docquier, Belgium]	Not applicable- Box 3.5 was deleted
6110	68	12	68	12	add the following paragraph in the Box 3.5 (Climate tipping points in the climate system) after Ocean Circulation example: "Trophic amplification in plankton: biogeochemical modelling suggests trophic amplification of the changes in phytoplankton biomass into the zooplankton biomass with the sea warming (Chust et al. 2014b [Chust, G., J. I. Allen, L. Bopp, C. Schrum, J. Holt, K. Tsiaras, M. Zavatarelli, M. Chifflet, H. Cannaby, I. Dadou, U. Daewel, S. L. Wakelin, E. Machu, D. Pushpadas, M. Butenschon, Y. Artioli, G. Petihakis, C. Smith, V. Garçon, K. Goubanova, B. Le Vu, B. A. Fach, B. Salihoglu, E. Clementi, and X. Irigoien. 2014. Biomass changes and trophic amplification of plankton in a warmer ocean. Global Change Biology 20:2124-2139.]). Trophic ampli?cation (or attenuation) describe the propagation of a hydroclimatic signal up the food web, causing magni?cation (or depression) of biomass values along one or more trophic pathways. Projected warming characterized by an increase in sea surface temperature of 2.3 °C leads to a reduction in zooplankton and phytoplankton biomasses of 11% and 6%, respectively. This suggests negative ampli?cation of climate driven modi?cations of trophic level biomass through bottom-up control, leading to a reduced capacity of oceans to regulate climate through the biological carbon pump (Chust et al. 2014b). " [Guillem Chust, Spain]	Not applicable- Box 3.5 was deleted
57586	68	12	38	13	GIS is the official acronym for "Geographic Information System" (see also AR5) and shouldn't be used as acronym for Greenland Ice Sheet [Hans Poertner, Germany]	Not applicable- Box 3.5 was deleted
566	68	13	68	14	Due to differences in orbital forcing, the Last Interglacial is analogous to but not identical to a 1-2°C world; global mean SST appears roughly comparable to today (Hoffman et al 2017) but peak polar temperatures may be more like a 2°C world (though asynchronous between the poles). Claim of analogy needs citation. Hoffman, J.S., P.U. Clark, A.C. Parnell, and F. He, 2017: Regional and global sea-surface temperatures during the last interglaciation. Science, 355, 276-279. http://dx.doi.org/10.1126/science.aai8464 [Robert Koppu, United States of America]	Not applicable- Box 3.5 was deleted
3618	68	13			Remove 't'. [David Docquier, Belgium]	Not applicable - This box was deleted
3820	68	13			Eemian is strictly only defined for northern hemisphere. Use ages (ka BP) instead in Antarctic context [Olaf Eisen, Germany]	Not applicable- Box 3.5 was deleted
3822	68	13			delete t. [Olaf Eisen, Germany]	Not applicable - This box was deleted
6630	68	13	68	13	are in retreat.t.' should be 'are in retreat.' [Robert Shapiro, United States of America]	Not applicable - This box was deleted
9266	68	13			Please change "retreat.t. Paleo" to "retreat. Paleo" [Marco Turco, Spain]	Not applicable - This box was deleted
17436	68	13	68	13	Delete the strikethough "t" [David Schoeman, Australia]	Not applicable - This box was deleted
21946	68	13			Remove "t." [LUIS VALDES, Spain]	Not applicable - This box was deleted
35316	68	13	68	13	remote the "t." strikethrough [Ana Bastos, France]	Not applicable - This box was deleted
39886	68	13	68	13	Revise typos in "are in retreat.t. Paleo-climatic". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
44982	68	13	68	13	t. should be removed. [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
39888	68	14	68	14	Insert space after "for" in "for~1°C". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
568	68	15	68	16	Needs citation. See also Yau, A. M., Bender, M. L., Robinson, A., & Brook, E. J. (2016). Reconstructing the last interglacial at Summit, Greenland: Insights from GISP2. Proceedings of the National Academy of Sciences, 113(35), 9710-9715., [Robert Koppu, United States of America]	Not applicable- Box 3.5 was deleted
3824	68	18			blank after WAIS [Olaf Eisen, Germany]	Not applicable - This box was deleted
3826	68	18			this statements does not reflect the fact which models suggest that - those models are state of the art when it comes to ice dynamics? Or simplified version? [Olaf Eisen, Germany]	Not applicable- Box 3.5 was deleted
6632	68	18	68	18	WAIScould' should be 'WAIS could' [Robert Shapiro, United States of America]	Not applicable - This box was deleted
9268	68	18			Please change "WAIScould" to "WAIS could" [Marco Turco, Spain]	Not applicable - This box was deleted
10768	68	18	68	18	Change to 'GIS and WAIS could become vulnerable to…' [Franklin Paredes, Brazil]	Not applicable - This box was deleted
16162	68	18	68	18	East Antarctic Ice Sheet (EAIS) should not be neglected from this statement. The high-end palaeo GMSL estimates for LIG require an EAIS contribution. DeConto and Pollard modelling in reproducing the past would confirm that EAIS vulnerability is an issue, particularly at 2°C or greater. Suggest altering the sentence to read "....suggest the GIS, WAIS and parts of the EAIS could become vulnerable..." [Australia]	Not applicable- Box 3.5 was deleted
21948	68	18			insert space between "WAIScould" [LUIS VALDES, Spain]	Not applicable - This box was deleted
39890	68	18	68	18	Insert space in "WAIScould". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
57588	68	18	68	18	Make clear that W in WAIS stands for West here or write “west” out [Hans Poertner, Germany]	Not applicable- Box 3.5 was deleted
9270	68	21			Please change "behavior" to "behaviour" (also at line 29, page70) [Marco Turco, Spain]	Not applicable - This box was deleted
3622	68	22			Remove brackets. [David Docquier, Belgium]	Not applicable - This box was deleted
3828	68	22			Golledge et al: Not the state-of the art numerical models when it comes to ice dynamic details, but simplified versions that are built to allow long runs. Somewhat misleading. Should be added for clarity. [Olaf Eisen, Germany]	Not applicable- Box 3.5 was deleted
9272	68	22			Please change "(Golledge et al., 2015)obtain " to "Golledge et al., (2015) obtain" [Marco Turco, Spain]	Not applicable - This box was deleted
21950	68	22			insert space between "2015)obtain" [LUIS VALDES, Spain]	Not applicable - This box was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
39892	68	22	68	22	Insert space after closing parenthesis in "2015)obtain". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
44984	68	22	68	22	(Golledge et al., 2015) --> Parenthesis is should be removed. [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
56354	68	22	68	22	Remove parentheses around reference and change "obtain" to "obtained". [Annika Herbert, Australia]	Not applicable - This box was deleted
3624	68	23			Remove brackets. [David Docquier, Belgium]	Not applicable - This box was deleted
39894	68	23	68	23	Please revise "and de". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
44986	68	23	68	23	, and de (DeCont and Pollard. 2015) --> Something is wrong. [Hiroaki Kondo, Japan]	Not applicable - This box was deleted
56356	68	23	68	23	Remove "de" and move reference to the end of the statement. [Annika Herbert, Australia]	Not applicable - This box was deleted
60388	68	23	68	23	and de (DeConto and Pollard, 2016)12-14 m after 500 something missing. [United States of America]	Not applicable - This box was deleted
3830	68	25			contributions from Antarctica only? [Olaf Eisen, Germany]	Not applicable- Box 3.5 was deleted
21952	68	27		29	I think that appearance of new arid/semi arid areas and expansion of deserts should be mentioned in this paragraph [LUIS VALDES, Spain]	Not applicable- Box 3.5 was deleted
34056	68	27	68	37	Please consider content from Huang et al 2017 NCC on velocity of temperature change vs. velocity of productivity change; a tipping point for some parts of an ecosystem may occur while for another component of the ecosystem they might be a longer time-lag in response to temperature increase. [Norway]	Not applicable- Box 3.5 was deleted
56358	68	27	68	27	Change "biomes" to "biome". [Annika Herbert, Australia]	Not applicable - This box was deleted
55310	68	28	68	28	Greening or desertization? [ELISA BERDALET, Spain]	Not applicable- Box 3.5 was deleted
202	68	30	68	31	To the possible degradation of coral reefs I would add the topic of phase shift from coral dominated reefs to algal-dominated reefs. A suggested sentence: ' Global change drivers may also lead to one of the most drastic consequences of coral reef degradation, phase shifts (Dudgeon et al., 2010; Graham et al., 2013). This phenomenon is characterized by an abrupt decrease in coral abundance or cover and concurrent increase to dominance of non-reef-building organisms, such as algae and soft corals". Graham, N. A., Bellwood, D. R., Cinner, J. E., Hughes, T. P., Norström, A. V., Nyström, M. (2013). Managing resilience to reverse phase shifts in coral reefs. Frontiers in Ecology and the Environment, 11(10), 541-548.? Dudgeon, S. R., Aronson, R. B., Bruno, J. F., Precht, W. F. (2010). Phase shifts and stable states on coral reefs. Marine Ecology Progress Series, 413, 201-216.? [Baruch RINKEVICH, Israel]	Not applicable- Box 3.5 was deleted
17438	68	30	68	30	What is DRIJ? [David Schoeman, Australia]	Not applicable - This box was deleted
39896	68	30	68	30	Please revise "DRIJ". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
46024	68	30	68	31	Almost complete degradation of tropical coral reefs has been assessed to possibly occur at ~2°C warming (Schleussner et al., 2016) but it is unclear at present if this could be fully irreversible. This is a far reaching statement and the given reference is unclear. ‘a,b,c,d have to added. How reliable is the assessment? The topic is much better discussed on page 92/93) [Tim Rixen, Germany]	Not applicable- Box 3.5 was deleted
10412	68	31	68	31	could add Frieler, K., Meinshausen, M., Golly A., Mengel, M., Lebek, K., Donner, S., Hoegh-Guldberg, O. (2012) “Limiting global warming to 2°C is unlikely to save most coral reefs”, Nature Climate Change, 3, 165–170. as a relevant citation [Christopher Reyer, Germany]	Not applicable- Box 3.5 was deleted
34058	68	33	68	34	Is "damaging tipping points" the right wording? Please consider rephrasing to "irreversible tipping points". [Norway]	Not applicable- Box 3.5 was deleted
46732	68	36	68	36	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable- Box 3.5 was deleted
39898	68	39	68	39	Delete "[END BOX 3.5 HERE]". [Hernan Edgardo Sala, Argentina]	Not applicable - This box was deleted
17824	68	42	172	42	The title of section 3.4 is Observed impacts and projected risks in natural and human systems. The authors may want to move many parts of this section to the section 3.3. It would be better to focus on the projected risks in natural and human systems. Otherwise, it would be better to separate into the projected risks in natural system versus in human system. The authors may want that the section of 3.4.6 to 3.4.12 would be dependent section apart from other subsections. [Republic of Korea]	The chapter was organized based on plenary approved outcome, the judgement of the author team, and the totality of comments.
49186	68	42			Much of section 3.4 identifies differences between 1.5 and 2 deg - this overlaps with later sections on avoided impacts at 1.5 [Bill Hare, Germany]	The sections were organized to minimize overlap while comprehensively covering the issues required in the plenary approved outline.
56422	68	42	68	42	As noted elsewhere on the FOD, this section currently focuses on direct impacts of climate change on biodiversity. It is vital that it also gives due emphasis to the indirect impacts of climate change on biodiversity. See: Smithers, R.J. and Blicharska, M. (2016) Indirect impacts of climate change. Science 354: 6318, 1386. The following quote may be useful: "Climate change will bring indirect impacts to biodiversity through changes in socio-economic drivers,working practices, cultural values, policies and use of land and other resources. Due to their scale, scope and speed, many could be more damaging than the direct impacts, especially those that affect our highly modified landscapes, coasts and seas" (Smithers et al. 2008). Smithers, R.J.; Cowan C.; Harley, M.; Hopkins, J.J.; Pontier, H. and Watts, O. (2008) England Biodiversity Strategy: Climate Change Adaptation Principles. Conserving biodiversity in a changing climate. Defra, London. 16pp. https://www.gov.uk/government/publications/england-biodiversity-strategy-climate-change-adaptation-principles [Richard J. Smithers, United Kingdom (of Great Britain and Northern Ireland)]	These indirect impacts on biodiversity are included in the ecosystem services listed in section 3.4.3.6 and adding a specific sentence should not clarify the story, as more development should be necessary to deal with that sufficiently.
57796	68	42	159	1	Throughout the document, the authors employ the term “risk” as a close synonym for costs and threats. However, the plain English meaning of “risk” relates much more to uncertainty than it does to costs. SPM boxed statement 2.6 is an example of this misleading framing. The ISO standard 3100, section 2.1, documents the strong correspondence between the meaning of risk and the meaning of uncertainty. See https://www.iso.org/obp/ui/#iso:std:iso:31000:ed-1:v1:en As a result policy makers and others hear “uncertainty” when the authors employ the term “risk.” Explicating an alternative definition for risk does not solve this problem. The terms “threat” and “cost” are more appropriate plain English terms. The use of the term "risk" is innapropriate in this context. [Hunter Cutting, United States of America]	The authors used the glossary definition of risk, where risk is a function of hazard, exposure and vulnerability; see the glossary definition and definitions in the AR5 SREX and WGII report.
1410	68	46	70	13	The summary can be shortened by ca. 50%. It would be good to get a better sense of the range and limits of what will be presented thereafter and how the information will be structured [Karen Olsen, Denmark]	The length of the summary has been reduced by around 50% - reducing particularly the recital of AR5 findings.
6226	68	46	70	13	The summary can be shortened by ca. 50%. It would be good to get a better sense of the range and limits of what will be presented thereafter and how the information will be structured [Anne Olhoff, Denmark]	The length of the summary has been reduced by around 50% - reducing particularly the recital of AR5 findings.
18318	68	46	70	13	The summary can be shortened by ca. 50%. It would be good to get a better sense of the range and limits of what will be presented thereafter and how the information will be structured [Andrea TILCHE, Belgium]	The length of the summary has been reduced by around 50% - reducing particularly the recital of AR5 findings.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
46734	68	47	8	47	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - This section was rewritten
300	68	48	68	48	....literature has grown substantially.... [Paul Doyle, Canada]	Not applicable - This section has been rewritten
17440	68	48	68	48	Replace "is" with "has been". [David Schoeman, Australia]	Not applicable - This section has been rewritten
60390	69	3	69	48	These statements have no specific relevance to 1.5°C pathways, vis a vis any other climate scenario. Suggest rewriting to clarify specific issues related to 1.5°C scenarios, or removing. [United States of America]	Text has been modified accordingly.
57632	69	11	69	12	And depths, please include ocean life here [Hans Poertner, Germany]	Subsequent edits have removed discussion two other parts of the chapter.
9810	69	12			Altitude/altitudinal is a wrong word in this context. It is best to use "elevation"/"elevational" throughout the text, See the paper by McVicar & Körner (2013) on this issue: Oecologia. 2013 Feb;171(2):335-7. doi: 10.1007/s00442-012-2416-7. Epub 2012 Aug 18. [Pieter De Frenne, Belgium]	Have retained the former terminology given its wide use in the literature - noting the relevant alternative arguments.
17442	69	13	69	13	By "invasive species" do you mean climate migrants, translocated species, or both? It is important to distinguish between these different causes of "invasion" [David Schoeman, Australia]	Invasive species includes a broad category of novel species appearing in particular areas, as noted by the reviewer. A more in-depth discussion is not needed at this point in this short introductory text. The focus on subcategories of invasive species occurs later in the chapter.
34060	69	15	69	16	Please include "tropical" before "coral" as this is not an issue for cold water corals. [Norway]	Subsequent edits have removed the previous discussion that included mention of coral reefs.
3730	69	19			Change ti by to [Castor Muñoz Sobrino, Spain]	Accepted - Text was revised with the suggested edit
6634	69	19	69	19	due ti climate' should be 'due to climate' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
10770	69	19	69	19	Change to 'reversing changes due to climate change..' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
14086	69	19	69	19	to instead of ti [Nikhil Advani, United States of America]	Accepted - Text was revised with the suggested edit
21954	69	19			Replace "ti" by "to" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
32512	69	19	69	19	Change "ti" to "to" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
35114	69	19	69	19	The spelling of "to" is incorrect ans is written as ti. [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
35938	69	19	69	19	Replace 'ti' with 'to' [India]	Accepted - Text was revised with the suggested edit
40262	69	19	69	19	ti -----> to [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
40834	69	19	69	19	replace ti with to [NARESH KUMAR SOORA, India]	Accepted - Text was revised with the suggested edit
44428	69	19	69	19	reversing changes due ti climate change [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
44988	69	19	69	19	ti --> to [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
45594	69	19			due to climate change [Adela M Sánchez-Moreiras, Spain]	Accepted - Text was revised with the suggested edit
56820	69	19	69	19	due to instead of "due ti.."? [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
60392	69	19	69	19	ti --> to [United States of America]	Accepted - Text was revised with the suggested edit
62428	69	19	69	19	Instead of writing "due ti climate change", please write "due to climate change" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
9812	69	20			to instead of "ti" [Pieter De Frenne, Belgium]	Accepted - Text was revised with the suggested edit
39900	69	23	69	23	Replace "Working Group II" by "WGII" [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
164	69	28	69	28	Citation to Cramer et al should be Oppenheimer et al 2014: Reasons for Concern were discussed mainly in Chapter 19, not 18, or AR5 WGII. [Michael Oppenheimer, United States of America]	Accepted. Text was revised.
6636	69	28	69	28	included.' should be 'included:' [Robert Shapiro, United States of America]	Not applicable - This section has been rewritten
32514	69	28	69	28	Change "included" to "include" [Rosanne Martyr-Koller, Germany]	Not applicable - This section has been rewritten
57590	69	28	69	28	replace "." by ":" at the end of sentence [Hans Poertner, Germany]	Not applicable - This section has been rewritten
14088	69	41	69	43	Considering adding negative impacts to biodiversity from human coping responses [Nikhil Advani, United States of America]	Subsequent edits have shortened text removing the need for this consideration.
17444	70	5	70	5	Here, you introduce "+1.5ºC" and "+2.0ºC" as a notation. I prefer it to some of the other expressions used in this Chapter. The appearance also highlights the inconsistency of notation in this regard. [David Schoeman, Australia]	Not applicable - This section has been rewritten
44430	70	5	70	5	5th Assessment Report or "AR5"? [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
10414	70	16	70	16	I have the feeling there is quite some overlap here with the section on run-off that comes earlier [Christopher Reyer, Germany]	Taken into account. The text has been revised.
57140	70	16	70	16	Section 3.4.2: the term "water stress" is used several times in this report, including with references to changes in % of water stress. Please define the term in this chapter/section or in the glossary (ensuring that the definition used in the various papers were the percentages are found are all compatible with the definition in this SR) [Philippe Marbaix, Belgium]	Taken into account. The definition is included in the supplementary material.
16164	70	18	71	14	Water availability this discussion needs to emphasise that the likely outcome is a redistribution of water availability rather than a monotonic shift worldwide. [Australia]	Taken into account. This topic is covered in Chapter 4.
35116	70	18	70	18	The following study can be added under the section: In a warmer world, the hydrological impacts of climate change are more intense and spatially more extensive. in Scandinavian mountains vigorous increases in runoff are projected at 1.5 °C rise compared to pre industrial level (Donnelly et al., 2017) ref:Donnelly, C., Greuell, W., Andersson, J. et al. Climatic Change (2017) 143: 13. https://doi.org/10.1007/s10584-017-1971-7 [Shaukat Ali, Pakistan]	Taken into account. This study is covered in section 3.3.5.
45596	70	18			Is it considered in this section (3.4.2.1.) water scarcity due to increased salinity (sea level rise), eutrophication (increased water temperatures) or pollution? I am wondering about the values given in this section. [Adela M Sánchez-Moreiras, Spain]	Taken into account. The definition is included in the supplementary material.
53124	70	18	70	22	Withdrawal rate grows by about 10 – 12% for every 10 years. In 1995, global withdrawal rate was 3790 km3/yr, & consumption rate was 2074 km3/yr. in 1900, global withdrawal rate was 579 km3/yr. By 2050, global withdrawal rate would be 5240 km3/yr [4600 – 5800 km3/yr]. Asia is the single largest water user in the world – 57% of total water withdrawal & 70% of global water consumption. [Thian Gan, Canada]	Noted. The paragraph is cited from AR5.
6638	70	19	70	19	threats toits' should be 'threats to its' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9274	70	19			Please change "toits" to "to" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10772	70	19	70	19	Change to 'the world's population already suffers serious threats to its…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32518	70	19	70	19	Change "toits" to "to its" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
33508	70	19			several spaces missing - e.g. to its, [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised with the suggested edit
35118	70	19	70	19	The spacing is missing between following words : "toit, changecan, securityas, streamflow." Also in line 21, it should be "threatens" instead of threaten. [Shaukat Ali, Pakistan]	Accepted - Text was revised
40264	70	19	70	19	space between "to" "its" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
44990	70	19	71	23	There are so many connected words. [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
50942	70	19	70	19	...threats to its.. instead of "...threats toits.." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
58528	70	19	70	19	Typo, "toits" -> "to its" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
60394	70	19	70	19	toits --> to its [United States of America]	Accepted - Text was revised with the suggested edit
9276	70	20			Please change "availability,water" to "availability, water" [Marco Turco, Spain]	Accepted - Punctuation was edited
62430	70	20	70	20	Please widen the space between "change" and "can" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6640	70	21	70	21	Climate changecan alter the availability of water, and threaten water securityas' should be 'Climate change can alter the availability of water, and threaten water security as' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7014	70	21	70	21	changecan two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
7016	70	21	70	21	securityas two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9278	70	21			Please change "changecan" to "change can" and "securityas" to "security as" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10774	70	21	70	21	Change to 'Climate change can alter the availability of water, and threaten water security as…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
21956	70	21		49	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
40266	70	21	70	21	space between "change" "can" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
40836	70	21	70	21	securityas space between security as and many places such word merg occurred [NARESH KUMAR SOORA, India]	Accepted - Text was revised with the suggested edit
44432	70	21	70	21	Spacing issue in 2 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
50944	70	21	70	21	..Climate change can alter the availability of water, and threaten water security as.. instead of "..Climate changecan alter the availability of water, and threaten water securityas.." [Amjad Masood, Pakistan]	Accepted - Text was revised with the suggested edit
58530	70	21	70	21	Typo, "securityas" -> "security as" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
60396	70	21	70	21	changecan --> change can [United States of America]	Accepted - Text was revised with the suggested edit
60398	70	21	70	21	securityas --> security as [United States of America]	Accepted - Text was revised with the suggested edit
62432	70	21	70	21	Please widen the space between "security" and "as" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
28320	70	22	70	22	Please insert the missing term (before the brackets), or change the brackets to Unesco (2011). [Germany]	Not applicable - This section was rewritten
32516	70	24	70	24	Add "though" after "Even" [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
49188	70	24	70	25	This sentence doesn't make sense [Bill Hare, Germany]	Not applicable - This section was rewritten
6642	70	25	70	25	scarcity occurred' should be 'scarcity that occurred' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
17446	70	25	70	25	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This section was rewritten
9280	70	28			Please change "regions.Due" to "regions. Due" [Marco Turco, Spain]	Accepted - Sentence was revised
44434	70	28	70	28	semi-arid and arid regions.Due to increasing [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62434	70	28	70	28	Please widen the space between "regions;" and "Due" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
43214	70	32	70	46	The multimodel study by Y. Satoh et al (2017) projected water stress for Asia using an SSP framework to the 2050s and is relevant for citation here. "By 2050, 20% of the land area in the Asia-Pacific region, with a population of 1.6-2 billion, is projected to experience severe water stress." The sustainability scenario in 2050 (SSP1 + RCP4.5, anaologous to 1.5 in the near term) would result in ~200-360 million fewer people in water-stress compared to the "middle-of-theroad" (SSP2, rcp6.0) and "rocky road" (ssp3, rcp6.0) scenarios (in 2050). [Edward Byers, Austria]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
50696	70	32	70	46	The multimodel study by Y. Satoh et al (2017) projected water stress for Asia using an SSP framework to the 2050s and is relevant for citation here. "By 2050, 20% of the land area in the Asia-Pacific region, with a population of 1.6-2 billion, is projected to experience severe water stress." The sustainability scenario in 2050 (SSP1 + RCP4.5, anaologous to 1.5 in the near term) would result in ~200-360 million fewer people in water-stress compared to the "middle-of-theroad" (SSP2, rcp6.0) and "rocky road" (ssp3, rcp6.0) scenarios (in 2050). [Bastiaan van Ruijven, Austria]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
7018	70	34	70	34	greatereffect" two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9282	70	34			Please change "greatereffect" to "greater effect" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10530	70	34	70	36	The sentence is too complex and should be simplified. Besides, “greatereffect” should be “greater effect” and “changeover” should be “change over”. In general, there are many similar typos, and missing proper space between two words. They should be carefully checked. [Hong Yang, Switzerland]	Taken into account. The text has been revised.
10776	70	34	70	34	Change to 'generally have a greater effect on changes in water resource…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35120	70	34	70	37	The spacing is missing between following words: greatereffect, changeover, climatechange, ofpopulation. [Shaukat Ali, Pakistan]	Taken into account. Text revised.
40268	70	34	70	37	spaces between "greater" "effect", "change" "over", "Climate" "change" [Amal Hussein, Egypt]	Noted. The paragraph is cited from AR5.
44436	70	34	70	49	Spacing issue in numerous places [Rita Man Sze Yu, China]	Noted. The paragraph is cited from AR5.
49190	70	34	70	37	This paragraph should be more clear in the difference between global and regional impacts. In some regions the first sentence may not be true (i.e. climate change impacts may have a greater effect on water availability than population pressure in some areas) [Bill Hare, Germany]	Taken into account. The text has been revised.
62436	70	34	70	34	Please widen the space between "greater" and "effect" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6644	70	35	70	35	climate changeover the' should be 'climate change over the' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7020	70	35	70	35	changeover two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
10778	70	35	70	35	Change to 'climate change over the next few decades…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
7022	70	36	70	36	Climatechange two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9284	70	36			Please change "Climatechange" to "Climate change" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
10780	70	36	70	36	Change to 'preindustrial. Climate change, however,…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
18320	70	36	70	37	Which regional differences? [Andrea TILCHE, Belgium]	Noted. The paragraph is cited from AR5.
41386	70	36	70	37	How does climate change offset the effects of population pressure? [Lourdes Tibig, Philippines]	Noted. The paragraph is cited from AR5.
62438	70	36	70	36	Please widen the space between "Climate," and "change," [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6646	70	37	70	37	ofpopulation pressure' should be 'of population pressure' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7024	70	37	70	37	ofpopulation two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9286	70	37			Please change "ofpopulation" to "of population" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10782	70	37	70	37	Change to 'of population pressure….' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
32520	70	37	70	37	Please describe how climate change will drive migration and its cascading impact on water supply. [Rosanne Martyr-Koller, Germany]	Noted. The paragraph is cited from AR5.
12048	70	39	70	40	The reduction of water resource availability at 1.5°C global warming is smaller than the 2.0°C warming (see Section 3.3.5). this implies some global result, but section 3.3.5 refers to the Med and Middle-east droughts. This statement also conflicts with the previous paragraph (lines 36-37), which states that climate change will regionally exacerbate or offset population pressure effects. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been revised.
18322	70	39	71	3	Socio-economic factors are identified as having more importance than climatic factors (1.5 vs 2) for water availability. However, efficiency improvements as well as (sustainable/unsustainable) water management are probably even more important, and not mentioned in the paragraph. [Andrea TILCHE, Belgium]	Taken into account. This topic is covered in Chapter 4.
19348	70	39	71	6	This is also true based on results at the regional scale. At the European scale, the degree of vulnerability to freshwater stress under transient high end climate change responses between 2°C and 1.5°C is highly depended on the socioeconomic developments as formulated by the corresponding SSPs (2, 3 and 5). Reference: Koutroulis, A. G., Papadimitriou, L. V., Grillakis, M. G., Tsanis, I. K., Wyser, K., & Betts, R. A. (2018). Freshwater vulnerability under high end climate change. A pan-European assessment. Science of the Total Environment, 613, 271-286. [Aristeidis Koutroulis, Greece]	Taken into account. This topic is covered in Section 3.3.5.
43212	70	39	70	49	The multimodel study by Y. Satoh et al (2017) projected water stress for Asia using an SSP framework to the 2050s and is relevant for citation here. "By 2050, 20% of the land area in the Asia-Pacific region, with a population of 1.6-2 billion, is projected to experience severe water stress." The sustainability scenario in 2050 (SSP1 + RCP4.5, anaologous to 1.5 in the near term) would result in ~200-360 million fewer people in water-stress compared to the "middle-of-theroad" (SSP2, rcp6.0) and "rocky road" (ssp3, rcp6.0) scenarios (in 2050). [Edward Byers, Austria]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
50694	70	39	70	49	The multimodel study by Y. Satoh et al (2017) projected water stress for Asia using an SSP framework to the 2050s and is relevant for citation here. "By 2050, 20% of the land area in the Asia-Pacific region, with a population of 1.6-2 billion, is projected to experience severe water stress." The sustainability scenario in 2050 (SSP1 + RCP4.5, anaologous to 1.5 in the near term) would result in ~200-360 million fewer people in water-stress compared to the "middle-of-theroad" (SSP2, rcp6.0) and "rocky road" (ssp3, rcp6.0) scenarios (in 2050). [Bastiaan van Ruijven, Austria]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
7026	70	40	70	40	socioeconomic two words united, separate them or put a hyphen between them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
10334	70	40	70	41	Reference or calculations is/are needed. Or is this sentence linked to the next one? If yes, it is not clear. [Hungary]	Taken into account. The text has been revised.
12050	70	42	70	49	Unclear. Rephrase for brevity and clarity (apologies if I have changed your meaning in any way) e.g. "The number of people exposed to new or aggravated water scarcity is projected to increase by 4%, 8% and 10% for warmings of 1.5, 2 and 3°C, respectively, particularly in Europe, Australia and Southern Africa (assuming a constant population; 50% confidence; Gerten et al., 2013). Under the SSP2 population scenario, 8% of the global population are projected to experience a 20% reduction in discharge under warming of 1.7°C in 2021-2040, increasing to 14% of the population under 2.7°C in 2043-2071 (Schewe et al 2014)..." [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been revised.
21958	70	42			Remove first bracket in (2013); the citation should read as: "(Gerten et al., 2013)" [LUIS VALDES, Spain]	Accepted - Punctuation was edited
44992	70	42	70	42	(Gerten et al., (2013)--> '(' before 'Gerten'should be removed. [Hiroaki Kondo, Japan]	Accepted - Punctuation was edited
6648	70	44	70	44	revealsto be' should be 'reveals it to be' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7028	70	44	70	44	revealsto two words united, separate them [Serhat Sensoy, Turkey]	Not applicable - This section was rewritten
9288	70	44			Please change "(2013)revealsto" to "(2013) reveals to" [Marco Turco, Spain]	Not applicable - This section was rewritten
10784	70	44	70	44	Change to 'Gerten et al. (2013) reveals to be the…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35122	70	44	70	44	The spacing is missing between the words "revealsto" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
58532	70	44	70	44	Typo, "revealsto" -> "reveals to" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
62440	70	44	70	44	Please widen the space between "(2013)", and "reveals" and "to" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6650	70	45	70	45	impacts as a result' should be 'impacts as a result of' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
12052	70	47	70	47	Explain more clearly what is meant by discharge - discharge drought events? [United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed prior to publication
9290	70	49			Please change "respectively.Exposure" to "respectively. Exposure" [Marco Turco, Spain]	Not applicable - This section was rewritten
17448	70	49	71	6	This whole paragraph needs careful editing. [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
62442	70	49	70	49	Please widen the space between "respectively.", and "Exposure" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6652	71	1	71	1	peopleat' should be 'people at' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7030	71	1	71	1	peopleat two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9292	71	1			Please change "peopleat" to "people at" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10786	71	1	71	1	Change to 'million people at 1.5ºC global warming…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
21960	71	1		49	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
24162	71	1	71	1	peopleat ---> "people at" [Mustafa Tufan Turp, Turkey]	Accepted - Text was revised with the suggested edit
35124	71	1	71	1	The spacing is missing between the words "peopleat" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
43166	71	1	71	1	peopleat [Edward Byers, Austria]	Accepted - Text was revised with the suggested edit
58534	71	1	71	1	Typo, "peopleat" -> "people at" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62444	71	1	71	1	Please widen the space between "people", and "at" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
7032	71	2	71	2	socioeconomic two words united, separate them or put a hyphen between them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9294	71	2			Please change ")," to ") ," [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
44438	71	2	71	47	Spacing issue in numerous places; year is missing in 3 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62446	71	2	71	2	Please widen the space between "SSP1–5),", and "however" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
9296	71	3			Please change "warming(Arnell and Lloyd-Hughes, 2014).On" to "warming (Arnell and Lloyd-Hughes, 2014). On " [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
32082	71	3	71	4	In addition to challenges arising from aridity, sea level rise and salinization are also important for small islands' freshwater availability [Jamaica]	Taken into account. This topic has been covered in section 3.4.5.
36414	71	3	71	4	In addition to challenges arising from aridity, sea level rise and salinization are also important for small islands' freshwater availability [Snaliah Mahal, Saint Lucia]	Taken into account. This topic has been covered in section 3.4.5.
49192	71	3	71	4	Reference is made to the increase in freshwater stress from aridity, but sea level rise and salinization is also important for small islands' freshwater availability [Bill Hare, Germany]	Taken into account. This topic has been covered in section 3.4.5.
60400	71	3	71	6	This statistic should be followed by reiterating the effect of socio-economic impacts on water stress, just as is done in the previous references in this paragraph. [United States of America]	Taken into account. The text has been revised.
62448	71	3	71	3	Please widen the space between "2014).", and "On" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6654	71	5	71	5	avoid substantial' should be 'avoid a substantial' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
127	71	6	71	6	region(t.b.c. "region (" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
9298	71	6			Please change "region(" to "region (" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
24224	71	6	71	6	region(Karnauskas et al.)." they are adjacent and missing reference year, please check the whole text [Nazan AN, Turkey]	Accepted - Text was revised with the suggested edit
32522	71	6	71	6	Karnauskas et al. citation missing year, [Rosanne Martyr-Koller, Germany]	Accepted - Reference was edited
35340	71	6			Karnauskas et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted - Reference was edited
35940	71	6			Year of reference needs to be added [India]	Accepted - Reference was edited
62450	71	6	71	6	Please widen the space between "region", and "(Karnauskas et al.)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
62452	71	6	71	6	Please verify this reference "(Karnauskas et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was edited
1412	71	8		14	Terrible! Who can understand this? Why are there sometimes ranges and sometimes not? [Karen Olsen, Denmark]	Taken into account. The text has been revised.
6228	71	8		14	Terrible! Who can understand this? Why are there sometimes ranges and sometimes not? [Anne Olhoff, Denmark]	Taken into account. The text has been revised.
12004	71	8	71	14	This paragraph is very confusing to read - what do the numbers refer to? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been revised.
17450	71	8	71	14	This whole paragraph needs careful editing. [David Schoeman, Australia]	Taken into account. The text has been revised.
18324	71	8		14	This listing format for the % statistics is difficult to understand. The message should be stated in words with only a few figures - or in a table if a large amount of figures is necessary. [Andrea TILCHE, Belgium]	Taken into account. The text has been revised.
28322	71	8	71	14	A 1-2% change in irrigation water seems negligible compared to other drivers. Is this paragraph necessary? What is "human configuration"? line 14: why are two numbers and two ranges given? [Germany]	Taken into account. The text has been revised.
49194	71	8	71	14	This paragraph should be clear in distinguishing between global and regional effects. The data imply that regional differences in the role of climate change are substantial, but this doesn't come across clearly in the text. [Bill Hare, Germany]	Taken into account. The text has been revised.
58536	71	8	71	12	This paragraph is somewhat confusion. The first sentence mentions that changes in water demand at 2.0 degrees warming are likely to be similar to those under 1.5 degrees. However, the subsequent text discusses the results of Wada et al. (2013) who studied [irrigation] water demand increases under RCP2.6 and RCP4.5 (also RCP6, and RCP8.5). I think I the intention here is to compare Wada's results under RCP2.6 and RCP 4.5 which are assumed to correspond to the difference between 1.5 degrees and 2.0 degrees of warming but it isn't obvious from first reading of the text, and I am not sure if the assumption is justifiable. [Paul Leahy, Ireland]	Taken into account. The text has been revised.
9300	71	9			Please change "(2013)projects" to "(2013) projects" [Marco Turco, Spain]	Not applicable - This text was deleted
62454	71	9	71	9	Please widen the space between "(2013)", and "projects" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
1808	71	10	71	12	These % changes are between the period 2035-2065 and which baseline? [Greece]	Not applicable - This text was deleted
9302	71	12			Please change "respectively.Hanasaki" to "respectively. Hanasaki" [Marco Turco, Spain]	Not applicable - This text was deleted
24226	71	12	71	12	respectively.Hanasaki et al. (2013)" there is no gap after fullstop [Nazan AN, Turkey]	Not applicable - This text was deleted
45598	71	14	71	14	Are all these data correct? Can be higher with an increase of 1.6 ºC than an increase of 1.5 ºC. I am wondering why for some of the temperatures a range is given and not for others. [Adela M Sánchez-Moreiras, Spain]	Taken into account. The text has been revised.
58538	71	14	71	14	Some of the changes in global irrigation water withdrawals attributed to Hanasaki et al. (2013) are given ranges, e.g. 1.1-2.3% but some are single figures, eg. 1.8%. This seems strange. When I checked the paper, I could not find any of the quoted figures. [Paul Leahy, Ireland]	Taken into account. The text has been revised.
301	71	17	71	17	Looked for some refs and/or explanation of global warming affecting Jet Streams around the globe that could be aggravating floods/droughts, etc. This facet of climate change may be in report somewhere but have not found it. Should this (important) change not at least be mentioned in this subsection or elsewhere?? [Paul Doyle, Canada]	Rejected. The paragraph is cited from AR5.
17452	71	17	74	6	This whole section needs careful editing. [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35126	71	17	71	17	The following studies can be added under the section: In many European countries, impacts regarding floods may increase even if the future warming is limited to 1.5 ?C. A considerable increase in flood risk is predicted in Europe on 1.5 ?C increase in temperature compared to pre-industrial levels (Alfieri et al., 2018). Reference: Alfieri, L., Dottori, F., Betts, R., Salamon, P., & Feyen, L. (2018). Multi-Model Projections of River Flood Risk in Europe under Global Warming. Climate, 6(1), 6. http://dx.doi.org/10.3390/cli6010006 Lehner et al. (2017) used multiple drought metrics and Community Earth System Model aiming 1.5°C and 2°C above preindustrial level of temperature and investigated risk of consecutive drought years and simulations suggested that little change in drought risk for the U.S. Southwest and Central Plains compared to present day. While In case of Mediterranean and central Europe drought risk increases considerably for both 1.5°C and 2°C. Moreover this study suggests that limiting warming to 1.5°C instead of 2°C, may be beneficial for future drought risk but such benefits may be regional and highly uncertain. citation: Lehner, F., Coats, S., Stocker, T. F., Pendergrass, A. G., Sanderson, B. M., Raible, C. C., & Smerdon, J. E. (2017). Projected drought risk in 1.5 C and 2 C warmer climates. Geophysical Research Letters, 44(14), 7419-7428. [Shaukat Ali, Pakistan]	Taken into account. The text has been revised.
6656	71	18	71	18	themid-20th century' should be 'the mid-20th century' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
10336	71	18	72	24	Expected effects of climate change on annual flood events and drought periods are well summarized in this subchapter. However, there are several papers and/or projects (as we can see in subchapter 3.3.5), which also evaluate the effects of the expected sesonal changes on flood events and drought periods. These results may suggest that the seasonal changes in these extremes could affect more seriously the flood protection management, the water transport and transportation, and also the economy and the society. Please, c.f. subchapter 3.3.5 and also some EU financed projects, such as CLAVIER, ECCONET, CARPATH CC. Changes in seasonality of flood events and drought periods may worth a paragraph in this subchapter, in our view. [Hungary]	Taken into account. The text has been revised.
10788	71	18	71	18	Change to 'flooding since the mid-20th century…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
58542	71	18	71	18	Typo, "themid" -> "the mid" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
1810	71	20	71	20	IPCC AR5 instead of 'It'. [Greece]	Accepted - Text was revised with the suggested edit
6658	71	20	71	20	anthropogenicclimate change' should be 'anthropogenic climate change' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9304	71	20			Please change "anthropogenicclimate" to "anthropogenic climate" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10790	71	20	71	20	Change to 'that anthropogenic climate change has…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35128	71	20	71	20	The spacing is missing between the words "anthropogenicclimate" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
40270	71	20	71	21	spaces between "anthropogenic" "climate", "groundwater" "drought" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
58544	71	20	71	20	Typo, "anthropogenicclimate" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
58546	71	20	71	20	It is not clear what study or document "It" refers to [Paul Leahy, Ireland]	Accepted - Reference was edited
62456	71	20	71	20	Please widen the space between "anthropogenic", and "climate" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6660	71	21	71	21	groundwaterdrought' should be 'ground water drought' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9306	71	21			Please correct "groundwaterdrought" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10792	71	21	71	21	Change to 'water and groundwater drought frequency…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
53650	71	21	71	21	The word "groundwater drought" has been mistyped as "groundwaterdrought" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
62458	71	21	71	21	Please widen the space between "groundwater", and "drought" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
62460	71	23	71	23	Please widen the space between "demand", and "(Jiménez Cisneros et al., 2014b)" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6662	71	27	71	27	economic statues' should be 'economic status' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
53652	71	28	71	28	This sentence can be added "Other anthropogenic factors such as deforestation, changes of landuse patterns, encroachments of river and water courses, and filling of wetlands, mining etc. also responsible for the increase of flood vulnerability" [AKM SAIFUL ISLAM, Bangladesh]	Taken into account. Text revised
31054	71	29	71	29	also development in high risk locations (housing, infrastructure) [James FORD, Canada]	Taken into account. Text revised
16166	71	31	71	34	Extreme precipitation will be more intense under a warmer climate. However, the translation to flood risk is a more complex story. Yes, coastal flood risk will increase, particularly in the Asian megadeltas where precipitation is projected to increase and with higher sea levels. Yes, flash flood risk in urban areas is likely to decrease, But not necessarily so in larger catchments where flood risk is also very dependent on antecedent conditions (e.g. drier conditions from higher evaporation or where precipitation is projected to decrease). There are several papers in the literature that discuss this, one example being Do et al. (2017), Journal of Hydrology, 552, 28-43. [Australia]	Rejected. The paragraph is cited from AR5.
128	71	33	71	33	periods(t.b.c "periods (" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
9308	71	33			Please change "periods(" to "periods (" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
62462	71	33	71	33	Please widen the space between "periods", and "(Jiménez" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
1414	71	36		49	This is another example, similar to my previous comment regarding the same page, where the information is presented in a way that is not useful. It would be better to put this kind of detailed information into a table in the Annex and focus on the providing a better overview. (Let me make it clear that there are many instances with information presented in a similar way, and that this should be considered as an example and does not mean everything else is okay. The lead authors of the chapter need to fine comb the text and profoundly revise it.) [Karen Olsen, Denmark]	Taken into account. The definition is included in the supplementary material.
6230	71	36		49	This is another example, similar to my previous comment regarding the same page, where the information is presented in a way that is not useful. It would be better to put this kind of detailed information into a table in the Annex and focus on the providing a better overview. (Let me make it clear that there are many instances with information presented in a similar way, and that this should be considered as an example and does not mean everything else is okay. The lead authors of the chapter need to fine comb the text and profoundly revise it.) [Anne Olhoff, Denmark]	Taken into account. The definition is included in the supplementary material.
18326	71	36	72	8	Same comment as above - with response measures able to limit substantially impacts of floods, in addition to socio-economic conditions, and not explicitly mentioned in paragraph. [Andrea TILCHE, Belgium]	Taken into account. This topic is covered in Chapter 4.
18328	71	36		49	the information is presented in a way that is not particularly useful. It would be better to put this kind of detailed information into a table in the Annex and focus on providing a better overview. [Andrea TILCHE, Belgium]	Taken into account. The definition is included in the supplementary material.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
41388	71	36	72	8	No confidence levels? [Lourdes Tibig, Philippines]	Taken into account. The text has been revised.
49196	71	36	72	8	This paragraph is quite repetitive as it simply lists different studies and their findings, so it does not provide the reader with a clear assessment of the available literature and the ranges of findings. [Bill Hare, Germany]	Taken into account. The text has been revised.
60402	71	36	71	49	If these scenarios account for zero adaptation, they should be described as such. [United States of America]	Taken into account. This point has been covered in Chapter 4.
62464	71	38	71	38	Please widen the space between "(Winsemius et al., 2016).", and "Under 1.5°C" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
1812	71	39	71	40	As in comment #63 above. [Greece]	It was not possible to identify the comment
12006	71	40	71	43	Again, not clear what this sentence means - what does "impacts.. Increase by 100% and 170%..." mean? Is this number of people affected/economic cost? Could this be rephrased to make it clearer (if known..)? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been revised.
32524	71	40	71	40	Dottori et al. citation missing year, [Rosanne Martyr-Koller, Germany]	Accepted - Reference was edited
35130	71	40	71	40	The year of study is missing with the cititaion Dottori et al. [Shaukat Ali, Pakistan]	Accepted - Reference was edited
35342	71	40			Dottori et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted - Reference was edited
35942	71	40	71	40	Incomplete reference Dottori et al. Add complete reference [India]	Accepted - Reference was edited
40272	71	40	71	40	the word "submitted" was missed from the reference "(Dottori et al.) [Amal Hussein, Egypt]	Accepted - Reference was edited
62466	71	40	71	40	Please verify this reference "(Dottori et al.)."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was edited
1814	71	41	71	42	What does it mean 'in the proprotion of the populations affected'? [Greece]	Not applicable - This section was rewritten
1816	71	42	71	43	Which is the baseline for these % changes? [Greece]	Not applicable - This section was rewritten
21962	71	42			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was edited
6664	71	43	71	43	study on the population affected' should be 'study the population affected' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
28324	71	43	71	45	The Alfieri et al (2017) reference does not seem to support that 86% of the European population are affected at 1.5°C, or 93% at 2°C, please check and revise [Germany]	Noted. This statement has been checked and is supported by Alfieri (2018). The text has been revised.
32526	71	43	71	45	Consider rephrasing to: "Also, Alfieriet al studied the population..." [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
32528	71	43	71	43	Alfieri et al. cictaiton missing year, [Rosanne Martyr-Koller, Germany]	Accepted - Reference was edited
62468	71	43	71	43	Please verify this reference "Alfieri et al."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was edited
1818	71	45	71	45	86% and 93% of what? [Greece]	Accepted - Text was revised (% indicated population affected)
9310	71	45			Please change "(2017)find" to "(2017) find" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
21964	71	47			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This text was deleted
32530	71	47	71	49	Waren b et al citation missing year [Rosanne Martyr-Koller, Germany]	Accepted - Reference was edited
32532	71	47	71	47	Rephrase "signifiicant benefits" to "reduction of risk". See Comment 2. [Rosanne Martyr-Koller, Germany]	Taken into account. The text has been revised.
40274	71	47	71	47	the word "submitted" was missed from the reference "Warren b et al." [Amal Hussein, Egypt]	Accepted - Reference was edited
44994	71	47	71	47	Warran b --> Year is missing. [Hiroaki Kondo, Japan]	Accepted - Reference was edited
129	72	1	72	1	)found t.b.c. ") found" [teodoro georgiadis, Italy]	Not applicable - This section was rewritten
9312	72	1			Please change "(2014)found" to "(2014)found" [Marco Turco, Spain]	Not applicable - This section was rewritten
21966	72	1		49	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
21976	72	1		2	The use of the language qualifying the figures in terms of "would be reduced by" is hiding the magnitude of impacts at 1.5ºC. [LUIS VALDES, Spain]	Taken into account. The text has been revised.
44440	72	1	72	38	Spacing issue in numerous places; year is missing in 2 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62470	72	1	72	1	Please widen the space between "(2014)", and "found" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
130	72	2	72	2	)would t.b.c. ") would" and "C(" t.b.c. "C (" [teodoro georgiadis, Italy]	Not applicable - This section was rewritten
6666	72	2	72	2	to at the' should be 'to the' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
9314	72	2			Please change "SSP1–5)would" to "SSP1–5) would" [Marco Turco, Spain]	Not applicable - This section was rewritten
6668	72	3	72	3	differences ,however,is greater' should be 'differences, however, is greater' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9316	72	3			Please change "differences ,however,is" to "differences, however, is" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
62472	72	3	72	3	Please cancel the spaceafter "differences", and widen the space between "however," and "is" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
131	72	4	72	4	.Kinoshita2 t.b.c. . Kinoshita" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
6670	72	4	72	4	global warming.Kinoshita' should be 'global warming. Kinoshita' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9318	72	4			Please change "warming.Kinoshita" to "warming. Kinoshita" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
9320	72	6			Please change "significant.Although" to "significant. Although" [Marco Turco, Spain]	Not applicable - This section was rewritten
58548	72	6	72	6	The use of the term "significant" here may lead to confusion with statistical significance. [Paul Leahy, Ireland]	Not applicable - This section was rewritten
62474	72	6	72	6	Please widen the space between "significant.", and "Although" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
41390	72	10	72	24	No confidence levels? [Lourdes Tibig, Philippines]	Taken into account. The text has been revised.
132	72	16	72	17	incomplete reference (warren) [teodoro georgiadis, Italy]	Accepted - Reference was edited
21968	72	16			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was edited
32534	72	16	72	18	Rephrase "signifiicant benefits" to "reduction of risk". See Comment 2. [Rosanne Martyr-Koller, Germany]	Taken into account. The text has been revised.
35344	72	16	72	17	Warren et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted - Reference was edited
40276	72	16	72	17	the word "submitted" was missed from the reference "Warren b et al." [Amal Hussein, Egypt]	Accepted - Reference was edited
62476	72	16	72	17	Please verify this reference "Warren b et al."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was edited
35944	72	17			Year of reference is missing needs to be added [India]	Accepted - Reference was edited
133	72	20	72	20	.study t.b.c. ". study" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
1820	72	20	72	24	These % changes are in which future year (compared to 1986-2005)? [Greece]	Rejected. No % changes are seen in the specified paragraph
9322	72	20			Please change "Liu et al.study" to "Liu et al.study" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
21970	72	20			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was edited
24164	72	20	72	20	Liu et al. ---> Reference year? [Mustafa Tufan Turp, Turkey]	Accepted - Reference was edited

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35132	72	20	72	20	The year of study is missing with the cititaion Liu et al. [Shaukat Ali, Pakistan]	Accepted - Reference was edited
35346	72	20			Liu et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted - Reference was edited
40278	72	20	72	20	the word "submitted" was missed from the reference "Liu et al." [Amal Hussein, Egypt]	Accepted - Reference was edited
40280	72	20	72	24	Also, climate change scenarios expected that there will be increase in the occurrence of extreme events like floods and droughts to which all Nile countries are vulnerable, this could be attributed to that climate change which might cause, as reported by many agencies, that the natural flow of the River Nile will be reduced due to the reduction of rainfall on the upper Nile Basins as well as the reduction of rainfall on the east Mediterranean coastal zone. (Reference: Third National Communication Reports of Climate Change in Egypt (2016) http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	Rejected. Peer review papers are mainly cited in this section.
62478	72	20	72	20	Please verify this reference "Liu et al."; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Reference was edited
58550	72	21	72	21	Typo? "… urban population *exposure* in most regions would be decreased…" [Paul Leahy, Ireland]	Taken into account. The text has been revised.
1416	72	22		24	unclear [Karen Olsen, Denmark]	Taken into account. The text has been revised.
6232	72	22		24	unclear [Anne Olhoff, Denmark]	Taken into account. The text has been revised.
18330	72	22	72	22	difference in population affected not statistically significant? [Andrea TILCHE, Belgium]	Taken into account. The text has been revised.
21972	72	22			remove the symbol + preceding 232 [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
134	72	23	72	23	Cwarming t.b.c. "C warming" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
6672	72	23	72	23	1.5°Cwarming level' should be '1.5°C warming level' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
10794	72	23	72	23	Change to 'to droughts at the 1.5°C warming level…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
62480	72	23	72	23	Please widen the space between "1.5°C", and "warming" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6674	72	24	72	24	but increase by' should be 'but increased by' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
16168	72	27	74	6	These sections should be removed as there's very little indication of how or if these systems would be affected by a 1.5C warming. [Australia]	Taken into account. The text has been revised.
40282	72	27	72	47	This reference could be used for data about underground water in Egypt : Elshinnawy I. A. (2012), Monitoring of Climate Change Risk Impacts of Sea Level Rise on Groundwater and Agriculture in the Nile Delta, Food and Agriculture Organization of the United Nations (FAO), Technical cooperation Program, Egypt, TCP/EGY/3301 (D) [Amal Hussein, Egypt]	Rejected. Peer review papers are mainly cited in this section.
35134	72	34	72	47	In the citation of studies, the spacing is missing between author's name and et al i.e. "Kaiser et al., and Salem et al." [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
24796	72	36	72	38	There is a high agreement in the research community in the prediction that future potential scenarios will reduce groundwater resources in most dry subtropical regions (Eg. In Spain; Pulido-Velazquez et al., 2018), although, in some occasion, a potential increase in rainfall variability, as expected under future scenarios, could increase recharge rates for a given mean rainfall. It would be due to a greater number of significant events that exceed the rainfall threshold required for generating recharge (Pulido-Velazquez et al., 2015). Pulido-Velazquez, D., Collados-Lara, Antonio-Juan, Alcalá, Francisco J., 2017, Assessing impacts of future potential climate change scenarios on aquifer recharge in continental Spain. Journal of Hydrology. Published on line. https://doi.org/10.1016/j.jhydrol.2017.10.0770022-1694/_ 2017 Elsevier B.V. All rights reserved. D. Pulido-Velázquez, JL García-Aróstegui, JL Molina, M. Pulido-Velázquez, 2015. Assessment of future groundwater recharge in semi-arid regions under climate change scenarios (Serral-Salinas aquifer, SE Spain). Could increased rainfall variability increase the recharge rate? Hydrol. Process. 29 (6), 828–844. DOI: 10.1002/hyp.10191 [David Pulido-Velazquez, Spain]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
21974	72	38			Replace "agreement;" by "agreement)" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
62482	72	38	72	38	Please widen the space between "agreement;", and "(Jiménez Cisneros et al., 2014b)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
58552	72	40	72	40	Typo "ground water" -> "groundwater". "Groundwater" is used elsewhere in document. [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
43216	72	41	72	44	Byers et al findings for groundwater stress index indicate groundwater hotspots in south-west North America, Middle east, central Asia, South Africa, Pakistan and North China regions. Based on Wada, Y., Wisser, D. and Bierkens, M.F.P., 2014. Global modeling of withdrawal, allocation and consumptive use of surface water and groundwater resources. Earth System Dynamics, 5(1), p.1 - using Hadgem2ES GCM and SSP2 population scenario. [Edward Byers, Austria]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
62484	72	43	72	43	Instead of writing "at the 2ºC (RCP8.5) (Portmann et al., 2013).", please write "at the 2ºC (RCP8.5; Portmann et al., 2013)." [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6676	72	46	72	46	decreases project to cause' should be 'decrease projected to cause' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10416	72	47	72	47	Should be translated in US dollar, otherwise hard to grasp [Christopher Reyer, Germany]	Taken into account. The text has been revised.
28326	72	47	71	47	What is the value added of including the price change in absolute terms? Suggest to delete the cost estimate, if kept, please express also in relative terms (% increase compared to) instead of absolute values [Germany]	Taken into account. The text has been revised.
53654	72	47	72	47	Though it was mentioned that depletion of groudwater in the northwest Bangladesh was due to the increase in temperature of around 1.6–5.6°C, there are other influencing factors for groundwater depletion. Dey et al. (2017, doi:10.1016/j.gsd.2017.02.001) argued that major influencing factors for natural replenishment of aquifer such as, total annual rainfall significantly reduced by about 25.6% during 1981–2014, average annual river water levels slightly declined; wetland areas significantly reduced by about one-third; while the area irrigated for dry season rice (boro), the main driver of groundwater depletion, has increased about three folds during 1981–2014. [AKM SAIFUL ISLAM, Bangladesh]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
21978	73	1		49	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
28328	73	1	73	27	This section on water quality is one of the examples where only scattered evidence seems available, resulting in a qualitative assessment with little relevance. Suggest to remove this and similar sections, or move the available evidence into a more meta-level table which combines statements on impacts with a scarce evidence base. (see also our general comment on the whole Chapter 3). [Germany]	Taken into account. The text has been revised.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
31986	73	1	73	27	I would recommend to look at the study of Breitburg et al., 2018 to outlines the declining oxygen in the global ocean and coastal waters under the global warming. This effects directly the fishing industry long-run and total ecosystem in ocean. .. Breitburg, D., Levin, L. A., Oschlies, A., Grégoire, M., Chavez, F. P., Conley, D. J., ... & Jacinto, G. S. (2018). Declining oxygen in the global ocean and coastal waters. Science, 359(6371), eaam7240. [Sisira S. Withanachchi, Germany]	Taken into account. This topic is covered in section 3.4.4.
40284	73	1	73	27	Salinity is another important water quality issue in Egypt, salinity of groundwater in coastal areas (such as in Delta areas) due to sea level rising may cause contamination of public water supplies and encourage unhygienic practices. (Reference: Third National Communication Reports of Climate Change in Egypt (2016) http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	Taken into account. This topic is covered in section 3.4.5.
9324	73	4			Please change "2014b).Since" to "2014b). Since" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
44442	73	4	73	24	Spacing issue in numerous places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62486	73	4	73	4	Please widen the space between "(Jiménez Cisneros et al., 2014b).", and "Since AR5" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6678	73	5	73	5	watershed and in region' should be 'watershed and regional' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
62488	73	5	73	5	Please widen the space between "in region", and "(e.g., Marszelewski" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
135	73	8	73	8	thatclimate t.b.c "that climate" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
6680	73	8	73	8	thatclimate change' should be 'that climate change' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7034	73	8	73	8	thatclimate two words united, separate them [Serhat Sensoy, Turkey]	Accepted - Text was revised with the suggested edit
9326	73	8			Please change "thatclimate" to "that climate" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
17454	73	8	73	10	And elsewhere in this section…it would be good to have a brief discussion of the underlying mechanisms of, for example, deterioration in water quality. [David Schoeman, Australia]	Taken into account. The mechanisms in question are included in the supplementary materials.
35136	73	8	73	8	The spacing is missing between the words "thatclimate" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
44996	73	8	73	8	thatclimate--> that climate [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
58554	73	8	73	8	Typo, "thatclimate" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
62490	73	9	73	9	Instead of writing "high agreement)(Jiménez", please write "high agreement; Jiménez" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6682	73	12	73	12	has been' should be 'have been' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7328	73	12	73	14	See also Arheimer et al. 2012 (DOI 10.1007/s13280-012-0323-0) - process based nutrient and climate change impact study for all of Baltic Sea basin [Chantal Donnelly, Australia]	Noted. Impacts at 1.5ºC and 2ºC could not be found.
6684	73	15	73	15	differences of at' should be 'differences at' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
6686	73	16	73	16	comparing the risks' should be 'compared to the risks' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
60404	73	17	73	27	Highlight that the study referenced examines a single location. Given the framing that there is limited evidence due to lack of sufficient information, the authors should cite both cases in which differences in adverse impacts between 1.5 and 2°C are found and cases in which significant differences are not. [United States of America]	Taken into account. The text has been revised.
1822	73	18	73	18	Please define 'slightly' here. [Greece]	Accepted - Sentence was revised
6688	73	18	73	18	1.5ºCand' should be '1.5ºC and' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
6692	73	18	73	18	2.5ºCglobal' should be '2.5ºC global' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
10796	73	18	73	18	Change to 'increase at 1.5ºC and further at 2.5ºC global warming from the…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35946	73	19	73	20	Change ' less decrease' to 'decrease less' [India]	Accepted - Sentence was revised
62492	73	19	73	19	Instead of writing "(1997–2007)(Bonte and Zwolsman, 2010).", please write "(1997–2007; Bonte and Zwolsman, 2010)." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Sentence was revised
6690	73	20	73	20	to less decrease' should be 'to decrease less' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
58556	73	20	73	20	Expression is clumsy, I suggest "decrease by less" instead of "less decrease" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
62494	73	20	73	20	Please widen the space between "at 1.5ºC", and "(RCP2.6 in 2050–2055)" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
45600	73	21	73	27	I think that there is a mistake in the following sentences, as they refer to two possible land-use change scenarios, but actually the two proposed scenarios are the same: 1) conversion of forest to agriculture and 2) of forest to agriculture: "In the three river basins (Sekong, Sesan, and Srepok), (Trang et al., 2017) projects annual N (P) yield changes at around 1.5ºC global warming (RCP4.5 in 2030s) and around 2ºC (RCP8.5 in 2030s) as well as with combinations of two land-use change scenarios:1) conversion of forest to agriculture and 2) of forest to agriculture. The projected changes under 1.5ºC and 2.0ºC scenarios are 7.3(5.1)% and –6.6(–3.6)%, whereas under the combination of land-use scenarios are 1) 5.2(12.6)% and 8.8(11.7)%, and 2) 7.5(14.9)% and 3.2(8.8)%, respectively", Please, review these data and correct! [Adela M Sánchez-Moreiras, Spain]	Taken into account. The text has been revised.
6694	73	22	73	22	what is 'annual N (P) yield changes' [Robert Shapiro, United States of America]	Taken into account. The text has been revised.
9328	73	22			Please change "(Trang et al., 2017)" to "Trang et al. (2017)" [Marco Turco, Spain]	Not applicable - This section was rewritten
62496	73	22	73	22	Instead of writing "(Trang et al., 2017)", please write "Trang et al., (2017)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6696	73	24	73	25	scenarios:1) conversion of forest to agriculture and 2) of forest to agriculture.' why is 2) a repreat of 1) ?? [Robert Shapiro, United States of America]	Taken into account. The text has been revised.
12008	73	24	73	25	Refers to "forest to agriculture" land-use change scenario twice - change one [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. The text has been revised.
35138	73	24	73	24	In the line, point 2 is repeated. [Shaukat Ali, Pakistan]	Accepted - Sentence was revised
44998	73	24	73	25	2) 'of forest to agriculture' is duplicated in 1). [Hiroaki Kondo, Japan]	Taken into account. The text has been revised.
53690	73	27	73	27	Water quality degradation will also increase due to the salinity propagation to the upstream of the rivers in the coastal areas [AKM SAIFUL ISLAM, Bangladesh]	Taken into account. This topic is covered in section 3.4.5.
62506	73	29	73	29	Please widen the space between "approximately" and "double" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
1418	73	30	74	6	The entire section could be deleted as it does not belong there [Karen Olsen, Denmark]	Noted. This part is based on WGII AR5 Chapter 3.
2244	73	30	74	1	This section focuses exclusively on water erosion. However, in dry lands, wind erosion is also significant in terms of soil fertility, desertification, and dust production. [Akihiko Ito, Japan]	Taken into account. This topic is covered in section 3.3.12.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
4700	73	30	74	6	This section, mention that there is little or no observational evidence yet that soil erosion and sediment loads have been altered significantly due to changing climate, i think this information must be checked, there is alot of studies about the relation between climate change and eolian and hydrous erosion especially in Africa (North Africa and Sahel region),also some studies discuss the same phenomena in Middel East. also there is very rich scientific bibliography about the relation between desertification and climate change especially in Africa. [Wael EL ZEREY, Algeria]	Noted. This part is based on WGII AR5 Chapter 3.
6234	73	30	74	6	The entire section could be deleted as it does not belong there [Anne Olhoff, Denmark]	Noted. This part is based on WGII AR5 Chapter 3.
16170	73	30	73	33	Agreed that 'there is little or no observational evidence yet that soil erosion and sediment loads have been altered significantly due to changing climate', particularly when impacts at 1.5ºC and 2ºC global warming are concerned. [Australia]	Rejected. The paragraph is cited from AR5.
16172	73	30	84	38	The work seems to be very descriptive - i.e. almost a list of selected citation. Very little synthesis of interpretation. There is also very limited discussion of soils as a component of the ecosystem. [Australia]	Noted. This part is based on WGII AR5 Chapter 3.
49440	73	30	74	6	The section 3.4. apparently lacks estimates of permafrost degradation influence on the infrastructure of subpolar regions. Probably, the most closest subsection for these estimates is the subsection 3.4.2.5 (or the subsection 3.4.3.5.1, but its title mostly focuses on natural systems). As alternative, a new subsection may be organized. The following literature can be evaluated: Streletskiy et al., 2015, doi: 10.1016/B978-0-12-394849-6.00010-X; Shiklomanov et al., 2017, doi: 10.1111/gere.12214. This references can be added also into the 3.5.6.3 subsection. [Alexander Chernokulsky, Russian Federation]	Rejected. Out of the scope
40286	73	31	73	43	Climate change and sea level rise are associated with direct impacts, which include the erosion and inundation of sandy beaches, and thus, the gradual regression of shorelines of the Egyptian Coastal zone. The gradual sea level rise may possibly lead to increased erosion rates, that may cause beach erosion at the narrow and low-level sand barrier - which separates the sea from the northern lakes – which will result in the gradual merging of those lakes with the sea, as is foreseen for Lake Manzala in Egypt. Also, the northern coast and Delta are strongly affected by climate change (coastal erosion, sea level rise and soil salinity). (References: 1- Initial National Communication Reports of Climate Change in Egypt (unfccc.int/resource/docs/natc/egync1.pdf); 2- Second National Communication Reports of Climate Change in Egypt (unfccc.int/resource/docs/natc/egync2.pdf); 3- Third National Communication Reports of Climate Change in Egypt (http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	Taken into account. This topic is covered in section 3.4.5.
486	73	32	73	32	A typo: "due tochanging" should be "due to changing" [Taoyuan Wei, Norway]	Accepted - Text was revised with the suggested edit
6698	73	32	73	32	tochanging' should be 'to changing' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
9330	73	32			Please change "tochanging" to "to changing" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
10798	73	32	73	32	Change to 'significantly due to changing climate…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35140	73	32	73	32	The spacing is missing between the words "tochanging" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
45000	73	32	73	32	tochanging --> to changing [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
58558	73	32	73	32	Typo, "tochanging" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
62498	73	32	73	32	Please widen the space between "agreement,", and "(Jiménez" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6700	73	35	73	35	there are increasing number' should be 'there are an increasing number' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
16174	73	35	73	37	The claim 'rainfall amount is the most important factor (Lu et al., 2013)' is not necessarily true, in fact the rainfall intensity is more important, thus has more impact on soil erosion than rainfall amount in rainfall events. [Australia]	Noted. The paragraph is cited from AR5.
6702	73	45	73	45	papers in respect of climate change' should be 'papers about climate change' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
488	73	46	73	46	A typo: "the world(Li and Fang, 2016" should be "the world (Li and Fang, 2016" [Taoyuan Wei, Norway]	Accepted - Text was revised with the suggested edit
44444	73	46	73	46	the world(Li and Fang, 2016), however [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62500	73	46	73	46	Please widen the space between "world", and "(Li and Fang, 2016)" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
6704	73	47	73	47	differences of average' should be 'differences between average' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
6706	73	49	73	49	annual sediment loads' should be 'annual sediment load' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
9332	74	1			Please change "warming(" to "warming (" [Marco Turco, Spain]	Accepted - Text was revised with the suggested edit
12882	74	1			…1.5°C and 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Editorial - copyedit to be completed prior to publication
21980	74	1			insert space between "warming(Cousino"" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
9716	74	3	74	6	Shouls also note that the size of risks will depend on the level of adaptation made under 2c vs 1.5c. Additionally, also point to the gaps in literature specific to 1.5c on these aspects. [Mustafa BABIKER, Sudan]	Not applicable - The text has been revised
18332	74	3	74	6	In addition to socio-economic variables, adaptation measures could also have more impact than climate change itself. Need to specify that this finding does not conisder the possibility of adaptation options - which may go a long way in minimising/averting/addressing impacts of climate change under both 1.5 and 2 scenarios. [Andrea TILCHE, Belgium]	Not applicable - The text has been revised
41392	74	3	74	6	A very concise, informative way of summarizing the assessment. [Lourdes Tibig, Philippines]	Noted. Thanks.
61884	74	3	74	6	The summary or conclusion needs more substance (where? How?) to provide more content for the executive summary of the chapter on these aspects. [Valérie Masson-Delmotte, France]	Taken into account. Ch3 had to shortened upon request, and the summary was moved and arranged to be incorporated into ES.
62502	74	3	74	6	Is it the correct place of the summary? [JACQUES-ANDRE NDIONE, Senegal]	Taken into account. Ch3 had to shortened upon request, and the summary was moved and arranged to be incorporated into ES.
10338	74	4	74	4	We would like to recommend to insert the rate of evidence and agreement also after '2°C,' and before 'however'. [Hungary]	Taken into account. Ch3 had to shortened upon request, and the summary was moved and arranged to be incorporated into ES.
54702	75				Table 3.1 summary figures shouldbe included instead of the empty table [Qudsia Zafar, Pakistan]	Not applicable- The table has been revised
57592	75	1	75	1	refer to table somewhere in the text [Hans Poertner, Germany]	Not applicable- The table has been revised
57634	75	1	75	1	This table is very detailed and has no data at all. Many of these columns could be moved to SOM leaving a summary – projected impacts at 1.5 and 2C. Repurposing the risk tables from AR5 WGII could fit the purpose here. This comment applies to subsequent tables [Hans Poertner, Germany]	Not applicable- The table has been revised

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40288	75	1	75	2	Climate change is likely to affect water availability to Egypt, although the direction of change is uncertain. Some studies foresee a decline of up to 70 percent in Nile water availability, while other studies project an increase in Nile water levels by 25 percent. Moreover,it has been forecasted that in 2025 the population of Egypt will increase to about 95 million from about 75 million in 2008, leading to a decrease in per capita water availability from 800 to 600 m3 per year assuming that total water availability remains constant. The main water-using sector in Egypt is agriculture, followed by municipal and industrial uses. Total water withdrawal in 2000 was estimated at 68.3 km3 and on 2010 it was estimated to be 69.25km3. Potential impacts of climate change on the hydrology and water resources of the River Nile Basin downscaled from runs of 11 GCM's and 2 global emission scenario's (A2 & B1), (details are written the Third National Communication Reports of Climate Change in Egypt (2016). (http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	Noted.
29354	76		76		Figure 3.17 has a bad quality [Borbala Galos, Hungary]	See response to comment #24228
54704	76				Fig 3.17 not clear [Qudsia Zafar, Pakistan]	Accepted. A sentence has been added to explain how to read the figure 3.17B.
57052	76				Figure 3.17: remove (b) - adjust legend [AMANDINE PASTOR, France]	Fig. 3.17 (a) was added
35948	76				Figure 3.17 (a) needs to be added [India]	Accepted - Figure was revised
610	76	1	85	2	Following my overall comment on this report, this section is poorly written and merely based on AR5 (Settele et al. 2014). More updated information is neeeded on the different sections which I am going to describe in the following lines. But also the section should also include mentions to: (i) invasions of exotic/alien species; (ii) risks due to erosion, desertification, soil sealing and soil compaction; (iii) acidification, acid deposition and N deposition; (iv) habitat destruction and fragmentation and land use changes. In addition, this section should also include a mention to how ecosystem engineers and soil food webs could be affected. [Maria Jesus Iglesias Briones, Spain]	Not accepted- We cannot accept this comment as most of the references cited have been published after AR5. In this report, we were asked to focus on the difference between projected risks at 1.5 and 2.0C warming, and to compare these effects. A wider general discussion of alien species, desertification, acidification and habitat destruction belongs in AR6. Information about these factors relating to 1.5C warming is not available.
2210	76	1	76	1	In this section, I recommend to add a new section on 'key ecosystem services' like that in ocean system (3.4.4.2.3). This is quite infromative for general public and policy makers, in addition to specific responses of biomes described by following sections. [Akihiko Ito, Japan]	We have added a general summarising statement about the overall implications of the literature on 1.5/2C for ecosystem services. However, there are no specific studies on ecosystem services as a whole in the literature in relation to 1.5/2C warming. Please note that specific ecosystem services are discussed in multiple sections (biomass, carbon storage, water, food).
16176	76	1	84	38	While there is good reference to Australian examples in the wider chapter 3, there is generally limited Australian/Southern Hemisphere evidence provided in these terrestrial ecosystems and biodiversity sections - some examples are therefore provided below, that could be considered for inclusion. More broadly, a fully referenced summary of impacts of climate change (observed and what is expected to occur) is provided in the 'Terrestrial Report Card 2013 Climate change impacts and adaptation on Australian biodiversity', found at https://terrestrialclimatechange.org.au/BioDiversity_Report_card.pdf (link to references provided in that document). [Australia]	Accepted - Reference was added to that summary in regional risks section.
17706	76	1	75	2	Please consider and deal with the cases of the Asia and temperate foreset ecosystem. [Republic of Korea]	Yes, the Asia and temperature forest ecosystem should be included. The related content has been summarized and added in brief due to the limited pages. e.g., the Latitudinal and elevational shifts of biomes temperate regions have been detected (Settele et al. 2014, AR5) and new studies confirm this (e.g. for shrub encroachment on to tundra, (Ward et al. 2015) . Attribution studies indicate that anthropogenic climate change has made a greater contribution to these changes than any other factor (Settele et al. 2014 (AR5), medium confidence). Seddon et al. (2016) quantitatively identified ecologically sensitive regions to climate change in most of the continents from tundra to tropical rainforest. Here, the temperate forest phenology is projected to gain 14.3 days in the near term (2010-2039) and 24.6 days in the medium term (2040-2069), so in first approximation the difference between 2°C and 1.5°C global warming is about 10 days (Roberts et al. 2015).
34062	76	1			3.4.3 1 Terrestrial and wetland ecosystem: Ecosystem services are important aspects of this chapter, as stated on page 76, line 10-11, but the topic does not appear much in the rest of the texts. Consider including a separate subsection on this; e.g. parallel to Ch. 3.4.4.2.3 Key ecosystem services. [Norway]	Some ecosystem services are discussed (biomass, carbon storage), others are discussed in other sections (water, food). This report is too short to contain a detailed account of how biodiversity loss might affect ecosystem services, which is to be covered in more detail in IPCC AR6.
34064	76	1			3.4.3 Terrestrial and wetland ecosystem: The Arctic is one of the regions expected to warm up most rapidly and with largest consequences of the warming for the ecosystems, as stated in this section. Please revise throughout 3.4.3. for balance of the content regarding the Arctic, as the tropics, boreal and desert areas appear to have somewhat more coverage in the current text. [Norway]	The Arctic is discussed in several places (biome shifts, phenology), including in a specific section on Arctic and alpine ecosystems
35142	76	1	76	1	Following study can be added under the section: Smith et al. (2018) conclude that limiting warming to 1.5° can reduce, by up to 50%, the number of species facing a potential loss of 50% of their climatic range. Moreover, there would be an increase of between 5.5% and 14% of the amount of the globe that could potentially act as climatic refuge for plants and animals. Citation: Smith, P., Molotoks, A., Warren, R., & Malhi, Y. (2018). Impacts on terrestrial biodiversity of moving from a 2?C to a 1.5 ?C target. Philosophical Transactions of the Royal Society of London. Series A. [Shaukat Ali, Pakistan]	Accepted - Reference was added
40290	76	3	76	8	climate change will probably affect marine species through ocean acidification, or ecosystem stratification, or increasing oceanic dead zones. That may result in reduce overall ecosystem vulnerability to climate change. (Reference: Third National Communication Reports of Climate Change in Egypt (2016). (http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	This comment concerns the oceans section (3.4.4)
60406	76	3	76	17	This framing should be placed in the context of 1.5°C of warming. [United States of America]	Not applicable - This text was deleted
10418	76	6	76	8	This sentence could be further differentiate in a ense that there are models covering all these items but very few (if any) cover them all [Christopher Reyer, Germany]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16178	76	6	76	8	It would be worth also mentioning community-level models here, such as Generalised Dissimilarity Modelling which projects change in species composition, e.g. Ferrier S, Guisan A (2006) Spatial modelling of biodiversity at the community level. J Appl Ecol 43:393–404 (e.g. as applied to climate change implications in Prober et al. 2012 provided above). [Australia]	We agree that this kind of approach is useful, but the literature mentioned contains no information about impacts at 1.5C versus 2C, which is the focus of this report. A discussion of modelling approaches is important, but belongs in AR6 rather than in this very short special report.
6708	76	8	76	8	tomonitoring' should be 'to monitoring' [Robert Shapiro, United States of America]	See response to comment #9334
9334	76	8			Please change "tomonitoring" to "to monitoring" [Marco Turco, Spain]	Not applicable - This text was deleted
10800	76	8	76	8	Change to 'in addition to monitoring and experiments…' [Franklin Paredes, Brazil]	See response to comment #9334
30474	76	8	76	8	Typo: space missing "to monitoring" [France]	See response to comment #9334
45002	76	8	76	8	tomonitoring--> to monitoring [Hiroaki Kondo, Japan]	See response to comment #9334
35146	76	9	76	9	Following study can be added under the section : A study performed by Baiquan et al. (2018) investigated the changes occurring in the thermal growing season (TGS) over Northern Eurasia at 1.5°C and 2°C rise compared to preindustrial level. The study used 22 CMIP5 (under RCP4.5 and RCP8.5 scenarios). The projections show that Northern Eurasia will be exposed to prolonged and intense TGSs, if temperature increases to 1.5 °C and 2°C. The elongation of growing seasons under 1.5°C and 2°C warming is accredited to both later termination and earlier onset. Reference: Baiquan, Z., Zhai, P., Chen, Y., & Yu, R. (2018). Projected changes of thermal growing season over Northern Eurasia in a 1.5? and 2? warming world. Environmental Research Letters. [Shaukat Ali, Pakistan]	Accepted - Reference was added to section on Arctic ecosystems
16180	76	10			Should be "aspects of ecosystem services" [Australia]	Not applicable - This text was deleted
16182	76	11			What is meant by 'Observational analysis'? [Australia]	Not applicable - This text was deleted
16184	76	12			Change 'capacity of adaptation' to 'capacity to adapt'. This sentence is unclear [Australia]	Not applicable - This text was deleted
1420	76	13		17	The statement is unclear and suggests that there is no clear difference between 1.5 and 2, but that that does not mean there are no dangers. This is obvious, but the focues of the report is to identify the differences in impact, and where there are no differences the text should be reduced to mentioning that. [Karen Olsen, Denmark]	Not applicable - This text was deleted
6236	76	13		17	The statement is unclear and suggests that there is no clear difference between 1.5 and 2, but that that does not mean there are no dangers. This is obvious, but the focues of the report is to identify the differences in impact, and where there are no differences the text should be reduced to mentioning that. [Anne Olhoff, Denmark]	Not applicable - This text was deleted
18334	76	13		17	The statement is unclear and suggests that there is no clear difference between 1.5 and 2, but that that does not mean there are no dangers. This is obvious, but the focus of the report is to identify the differences in impact, and where there are no differences the text should be reduced to mentioning that. [Andrea TILCHE, Belgium]	Not applicable - This text was deleted
41394	76	13	76	16	Again, a highly important part of this subsection [Lourdes Tibig, Philippines]	Not applicable - This text was deleted
16186	76	16			for 2°C (or more) global warming scenarios. Is meant to say that the expected 2 degrees is more than for the 20th centure - sentence is unclear [Australia]	Not applicable - This text was deleted
612	76	20	77	6	There is no a single mention to the current observation that shrublands are colonisating tundra habitats, that moss carpets are under a risk of disappereance in tundra biomes due to warming and the cascading effects that this have on the functioning of these ecosystems (e.g. Ward et al. 2015. Ecology 96(1), 2015, pp. 113–123). [Maria Jesus Iglesias Briones, Spain]	Accepted - Text was revised with the suggested edit. A phrase has been added to acknowledge this, but there is insufficient space for further discussion, which belongs in AR6.
1826	76	20	76	34	An additional figure, showing the differential biome shift between 1.5 oC and 2 oC in different regions, would be also useful for the reader. [Greece]	This is shown in Figures 3.17A and 3.17B. Figure caption has been revised to include a sentence that helps to focus on this issue.
16188	76	20	76	30	The biome shift section could benefit from mentioning important concepts such as novel and disappearing environments, i.e. it is not just that biomes will move, communities will reassemble and there will be areas with a climate not currently represented on Earth (and others that disappear). The concept is described in Williams JW, Jackson ST, Kutzbach JE (2007b) Projected distributions of novel and disappearing climates by 2100 AD. Proc Natl Acad Sci USA 104:5738–5742. Examples of application (although not directly comparing 1.5 vs 2 degree scenarios) in Australia include: Prober SM, Hilbert DW, Ferrier S, Dunlop M, Gobbett D (2012) Combining community-level spatial modelling and expert knowledge to inform climate adaptation in temperate grassy eucalypt woodlands and related grasslands. Biodiversity & Conservation 21:1627–1650; 8. Williams KJ, Prober SM, Harwood TD, Doerr VAJ, Jeanneret T, Manion G, Ferrier S (2014) Implications of climate change for biodiversity: a community-level modelling approach, CSIRO Land and Water Flagship, Canberra. Available at: www.AdaptNRM.org [Australia]	We agree and it is an interesting concept to discuss, so we have mentioned it briefly. Unfortunately, most biome models only provide projections of biome shift. The literature mentioned contains no information about impacts at 1.5C versus 2C, which is the focus of this report. A discussion of modelling approaches is important, but belongs in AR6 rather than in this very short special report.
21982	76	21			insert space between "4(Settele" [LUIS VALDES, Spain]	Accepted - Punctuation was edited
44446	76	21	76	21	AR5 Chapter 4(Settele et al., 2014) confirmed [Rita Man Sze Yu, China]	See response to comment #21982
49630	76	21	76	30	I am missing a discussions on the difference betwwen climate-zone shifts and biome shift. Biomes should be defined, first, and then the implications of biomes not being able to migrate at the pace of climate-zone shifts should be discussed. [Karlheinz ERB, Austria]	Regional climate changes are described in section 3.3. RW has initiated a discussion with Sonia to see what can be done on this … relates to discussion of dynamics in LAM4. It appears clearly in the text that the biome shifts are related to vegetation, as they are simulated by 7 dynamic vegetation models (new Fig 3.15); Climate shifts are discussed in the regional climate sections 3.3.2 to 3.3.4
9428	76	23	76	26	Fig. 3-17 is taken from another paper, not from Warszawski et al. (2013). The figure is from Gerten et al. (2013). [Russian Federation]	Accepted - Reference was edited
41592	76	23			Explain "anthropogenic climate change" or add reference. [Czech Republic]	Reference is given (Settele et al. 2014, AR5)
60408	76	23	76	30	This paragraph is unclear. What does it mean to have 25% more biome shifts at 2 vs 1.5°C? It matters which biomes, and is it areal changes, averaged across biome classes? Figure 3-17 doesn't show what the paragraph says it does. Presumably the 25% was derived from Figure 3 of Warszawski et al. (2013). They use the term "fraction of natural vegetation threatened by severe change" as the metric, much more clear than 'biome shifts'. [United States of America]	Accepted- This confusion was a consequence of the fact that, previously, two figures were referred to and only one was displayed. Figures 3.17A and 3.17B are now well distinguished in the text.
62504	76	23	76	23	Please widen the space between "Chapter 4" and "(Settele et al., 2014)" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment #21982
44448	76	24	76	25	Global Circulation Models or "GCMs"? [Rita Man Sze Yu, China]	unclear what this comment refers to

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16190	76	26			Drielsma et al. (Drielsma, M.J., Love, J., Williams, K.J., Manion, G., Saremi, H., Harwood, T., Robb, J., 2017. Bridging the gap between climate science and regional-scale biodiversity conservation in south-eastern Australia. Ecological Modelling 360, 343–362) find that by 2070 biome contractions and shifts will lead to a biodiversity loss of between 3-17 % in eastern Australia, depending on the climate model. [Australia]	This is a very interesting paper, but unfortunately its climate projection ensembles are averaged and hence a clear difference between projections at 1.5 versus 2C global warming cannot be extracted, as it is necessary to compare the results for RCP4.5 in the 2030s and 2050s (for example) to do this.
136	76	29	76	29	approximatelydouble t.b.c "approximately double" [teodoro georgiadis, Italy]	See response to comment #9336
6710	76	29	76	29	approximatelydouble' should be 'approximately double' [Robert Shapiro, United States of America]	See response to comment #9336
7036	76	29	76	29	approximatelydouble two words united, separate them [Serhat Sensoy, Turkey]	See response to comment #9336
9336	76	29			Please change "approximatelydouble" to "approximately double" [Marco Turco, Spain]	Not applicable - This section was rewritten
9814	76	29			add space between approximately and double [Pieter De Frenne, Belgium]	See response to comment #9336
10802	76	29	76	29	Change to 'shifts is projected to approximately double…' [Franklin Paredes, Brazil]	See response to comment #9336
12054	76	29	76	29	need a gap between the words approximately and double (right at the end of the line) [United Kingdom (of Great Britain and Northern Ireland)]	See response to comment #9336
21984	76	29			insert space between "approximatelydouble" [LUIS VALDES, Spain]	See response to comment #9336
30476	76	29	76	29	Typo: space missing "approximatively double" [France]	See response to comment #9336
35144	76	29	76	29	The spacing is missing between the words "approximatelydouble" [Shaukat Ali, Pakistan]	See response to comment #9336
44450	76	29	76	29	projected to approximatelydouble [Rita Man Sze Yu, China]	See response to comment #9336
45004	76	29	76	29	approximatelydouble--> approximately double [Hiroaki Kondo, Japan]	See response to comment #9336
58562	76	29	76	29	Typo, "todouble" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
31988	76	30	76	34	This map is totally unclear: please check good quality map [Sisira S. Withanachchi, Germany]	Accepted - Quality of figures was improved
16192	76	31	77	6	Remove this graphic - it is not clear how it is relevant to the 1.5C scenario as it seems to apply to a +5C scenario [Australia]	Accepted - Figure caption was revised to show the difference between 1.5°C and 2°C.
24166	76	31	76	34	Figure 3.17's resolution is very low! [Mustafa Tufan Turp, Turkey]	See response to comment #24228
24228	76	31		34	figure 3.17" low resolution [Nazan AN, Turkey]	Accepted - Quality of figures was improved
24408	76	31	76	34	figure 3.17" low resolution [Nazan AN, Turkey]	See response to comment #24228
39978	76	31	76	32	Figure is so bad. It looks like screen shoot captured [Adi Nugraha, United States of America]	See response to comment #24228
46902	76	31	76	34	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	In Figure 3.17b (now Fig 3.15b), the reds are not close to the greens as they are used for lower temperature changes (<2°C) and greens for highest climatic changes (>4°C)
9430	76	32	76	34	The caption to the Fig. 3-17. It's mainly about water, river basins, etc. Should be corrected. [Russian Federation]	done
1824	76	34	76	34	What is 'Tg'? [Greece]	Accepted - Figure caption was revised
17456	77	4	77	4	The degree symbol is problematic [David Schoeman, Australia]	See response to comment # 41594
41594	77	4			Change format of °C [Czech Republic]	Accepted - Figure caption was revised
6712	77	5	77	5	mmediafor maps' should be 'm media for maps' [Robert Shapiro, United States of America]	See response to comment # 9338
9338	77	5			Please change "mmediafor" to "mmedia for" [Marco Turco, Spain]	Not applicable - This section was rewritten
45006	77	5	77	5	There is no Figure S5 in Annex 3.1. [Hiroaki Kondo, Japan]	Accepted - Figure caption was corrected
9818	77	9	77	45	Here the contrasting sensitivity to temperature (in change/°C) between plants and animals should be stressed, which can lead to phenology mismatches; this is not only found in the UK by Thackeray et al, 2016 [Pieter De Frenne, Belgium]	Accepted- We have cited this reference and discussed the point.
16194	77	9	77	45	An Australian example showing a linear relationship between temperature change and flowering date (derived from herbarium specimens of alpine species) provides a useful indication of effects at 1.5 vs 2 degrees: Gallagher RV, Hughes L, Leishman MR (2009) Phenological trends among Australian alpine species: using herbarium records to identify climate-change indicators. Australian Journal of Botany 57, 1-9. [Australia]	While the study is very interesting it is limited to a few species in a small part of Australia. Hence, there is no room to include this level of detail in this Special Report.
16196	77	9	77	45	Other important biological changes other than phenology such as sex ratios could also be mentioned, e.g. Holleley CE, O'Meally D, Sarre SD, Marshall Graves JA, Exax T, Matsubara K, Azad B, Zhang X, Georges A (2015) Sex reversal triggers the rapid transition from genetic to temperature-dependent sex. Nature 523, 79-82. [Australia]	We agree this may be important, but as it cannot be directly tied to 1.5/2C warming issues, discussion of this is deferred until AR6.
17458	77	9	77	45	The writing isn't great in this section, and could do with careful editing [David Schoeman, Australia]	Accepted - Text was revised
34066	77	9	77	45	3.4.3.2 Changes in phenology: In the high north plant phenology was not found shifting due to long-term experimental warming, please consider including work of Obenbauer et al, in the International Tundra Experiment, ITEX. [Norway]	Accepted - Reference was added
34068	77	9	77	45	3.4.3.2 Changes in phenology: There is substantial literature on phonological mismatches (species interactions change when one or several species change timing). Please consider revising section 3.4.3.2. accordingly. E.g. Høye et al 2007 in Science, ABA Terrestrial ecosystems chapter. [Norway]	Accepted- Rapid change in the high arctic is now highlighted, but using a more recent publication, since this volume reports on literature published since 2014.
41396	77	9	77	45	Thefindings presented in the review here could be better presented as an assessment in a table/or a figure that depicts the changes. [Lourdes Tibig, Philippines]	Suggestion was noted, but not implemented due to level of difficulty.
45604	77	9			Highlight here the consequences of the altered timing of phenological events, as the expected problems due to the gap among the life cycle of inter-connected species (i.e. the impact on the mutualistic interactions of flowering plants and insect pollinators; Willmer, 2012; Scaven and Rafferty, 2013). This is specially problematic for crop pollination with hughe impact on food production. [Adela M Sánchez-Moreiras, Spain]	Accepted- The subsection has been rewritten to focus more on the implications of changes in phenology for ecosystem functioning, and the references suggested have been cited.
50660	77	9	77	25	The recent evidence on globally or regionally significant greening and browning trends in biomes such as rainforests and tropical mountains in response to recent climate change eg Nature, 509(7498), p.86. Global change biology, 20(1), pp.203-215 suggests much a greater role for temperature induced moisture stress even both lower and higher elevation [Jagdish KRISHNASWAMY, India]	Accepted- A reference for tropical forest has been added.
50662	77	9	77	25	Would be desirable to cite papers on phenological changes in biomes with some of the highest observed rates of warming, ie Himalayas and other tropical mountains: eg PLoS One, 7(5), p.e36741, Global change biology, 20(1), pp.203-215. [Jagdish KRISHNASWAMY, India]	With more space (such AR6), it should be interesting to cite these papers. However, it is not possible in this report.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
56420	77	9	77	9	Although this section now includes some of the references provided when commenting on the FOD, the text would still benefit from inclusion of the following references in order to cover an adequate range of important implications of phenological change: Roberts, A.M.I.; Tansey, C.; Smithers, R.J. and Phillimore, A.B. (2015) Predicting a change in the order of spring phenology in temperate forests. Global Change Biology, 21: 2603–2611. Roy, D.B., Oliver, T.H., Botham, M.S., Beckmann, B., Brereton, T., Dennis, R.L.H., Harrower, C., Phillimore, A.B. & Thomas, J.A. (2015) Similarities in butterfly emergence dates amongst populations suggest local adaptation to climate. Global Change Biology. Amano, T.; Smithers, R.J.; Sparks, T.H. and Sutherland, W.J. (2010) A 250-year index of first flowering dates and its response to temperature changes. Proceedings of the Royal Society B, Biological Sciences, 277, 2451–2457. Phillimore, A.B.; Hadfield, J.D.; Jones, O.R. and Smithers R.J. (2010) Differences in spawning date between populations of common frog reveal local adaptation. Proceedings of the National Academy of Sciences of the United States of America, 107:18, 8292–8297. Thackeray S.J.; Sparks, T.H.; Frederiksen, M.; Burthe, S.; Bacon, P.; Bell, J.R.; Botham, M.S.; Brereton, T.M.; Bright, P.W.; Carvalho, L.; Clutton-Brock, T.; Dawson, A.; Edwards, M.; Elliott, J.M.; Harrington, R.; Johns, D.; Jones, I.D.; Jones, J.T.; Leech, D.I.; Roy, D.B.; Scott, W.A.; Smith, M.; Smithers, R.J.; Winfield, I.J. and Wanless, S. (2010) Trophic level asynchrony in rates of phenological change for marine, freshwater and terrestrial environments. Global Change Biology. 16:12, 3304–3013. [Richard J. Smithers, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account- The focus of this report is the comparison of projected impacts at 1.5/2C. The continued observation of climate change impacts to date adds confidence to the process of projecting impacts into the future. However, it is only in AR6 that there will be the space for a comprehensive update to observed changes in phenology. Hence, we have provided only a few examples of new evidence on observations of changes in phenology and have attempted to use citations from different regions rather than focusing disproportionately upon European temperate forests. Therefore, we have added one of the very recent citations suggested by the reviewer, since a full discussion and review will take place in AR6.
9432	77	10	77	25	Trend estimates should be accompanied with particular time period which they characterize. In particular, with regard to 'spring advancement of –2.8 ± 0.35 days per decade for plants and animals'. [Russian Federation]	This is not clear in the original paper.
10422	77	10	77	25	I think this paragraph is about historical, observed changes but it is never really mentionnned anywhere. The number such aas "-2.8+-0.35 days per decade" should be refering to a time period over which these trends were quantified. [Christopher Reyer, Germany]	This is not clear in the original paper.
16198	77	10	77	11	What scenario does this statement refer to? [Australia]	Text was revised- this refers to observations
21986	77	12			Modify the citation "(Parmesan and Hanley, 2015)" by "Parmesan and Hanley (2015)" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
45008	77	12	77	12	(Parmesan and Hanley, 2015) -->Parmesan and Hanley (2015), [Hiroaki Kondo, Japan]	See response to comment # 21986
9340	77	14			Please change "reolve" to "resolve" [Marco Turco, Spain]	Not applicable - This section was rewritten
10804	77	14	77	14	Change to 'are needed to resolve this. [Franklin Paredes, Brazil]	See response to comment #9340
21988	77	14			Add an "s" in "reolve" --> "resolve" [LUIS VALDES, Spain]	See response to comment #9340
30478	77	14	77	14	Typo: "resolve" [France]	See response to comment #9340
40292	77	14	77	14	reolve ----> "resolve" [Amal Hussein, Egypt]	See response to comment #9340
45010	77	14	77	14	reolve --> resolve [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
47090	77	14	77	14	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted - text has been revised
9342	77	17			Please change "that,in" to "that, in" [Marco Turco, Spain]	Not applicable - This section was rewritten
12056	77	17	77	17	that, in some regions' needs to be properly spaced [United Kingdom (of Great Britain and Northern Ireland)]	See response to comment #9342
21990	77	17		22	Please review these lines and correct spaces between words [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
35318	77	17	77	17	Peng et al. 2013 (doi:10.1038/nature12434) / "that , in" [Ana Bastos, France]	Accepted - Text was revised with the suggested edit
44452	77	17	77	27	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
62508	77	17	77	17	Please widen the space between "that," and "in" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment #9342
8350	77	18	77	18	'Tibet Plateau' is not an accurate version in English. It is suggested that 'Tibet Plateau' be reworded as 'the Tibetan Plateau' in all cases. [China]	Accepted - Text was revised with the suggested edit
12058	77	18	77	18	gap needed between plateau and bracket [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
62510	77	18	77	18	Please widen the space between "Plateau" and "(Liu et al. 2016)" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment #12058
6714	77	20	77	20	thenorth' should be 'the north' [Robert Shapiro, United States of America]	See response to comment # 9344
9344	77	20			Please change "thenorth" to "the north" [Marco Turco, Spain]	Not applicable - This section was rewritten
10806	77	20	77	20	Change to 'for birds in the north hemisphere…' [Franklin Paredes, Brazil]	See response to comment # 9344
30480	77	20	77	20	Typo: the north [France]	See response to comment # 9344
45012	77	20	77	20	thenorth-->the north [Hiroaki Kondo, Japan]	See response to comment # 9344
6716	77	22	77	22	changeinmost' should be 'change in most' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7038	77	22	77	22	changeinmost three words united, separate them [Serhat Sensoy, Turkey]	See response to comment # 6716
10808	77	22	77	22	Change to 'climate change in most of…' [Franklin Paredes, Brazil]	See response to comment # 6716
12060	77	22	77	22	gaps needed between full stop and Seddon, and between 'change in most' [United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be completed prior to publication
30482	77	22	77	22	Typo: "change in most" [France]	See response to comment # 6716
35148	77	22	77	22	The spacing is missing between the words "changeinmost" [Shaukat Ali, Pakistan]	See response to comment # 6716
35320	77	22	77	22	2015). Seddon [...] / "change in most" [Ana Bastos, France]	Editorial - copyedit to be completed prior to publication
45014	77	22	77	22	changeinmost-->change in most [Hiroaki Kondo, Japan]	See response to comment # 6716
58564	77	22	77	22	Typo, "changeinmost" [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
62512	77	22	77	22	Please widen the space between "2015)." and "Seddon et al. (2016)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
10810	77	23	77	23	Change to 'available data are less numerous..' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
30484	77	23	77	23	Typo: delete one « are » [France]	See response to comment # 10810
40294	77	23	77	23	changeinmost -----> "change" "in" "most" [Amal Hussein, Egypt]	See response to comment # 6716
40296	77	24	77	24	delete one "are" of the two [Amal Hussein, Egypt]	See response to comment # 10810
7040	77	25	77	25	For south eastern Europe and eastern Mediterranean, Turkoglu et al (2016) have been evaluated the effects of climate changes on phenological periods of apple, cherry and wheat in Turkey.They found that, an increase of 1.0ºC in the temperatures has been caused to shift on harvest times of apple, chery and wheat by 5, 4 and 8 days earlier, respectively. Turkoglu, N., Sensoy, S., Ayd?n, O, 2016, Effects of climate changes on phenological periods of apple, cherry and wheat in Turkey, International Journal of Human Sciences, 13(1), 1036-1057. doi:10.14687/ijhs.v13i1.3464, Url: http:////www.j-humansciences.com/ojs/index.php/IJHS/article/view/3464/1694. [Serhat Sensoy, Turkey]	Rejected- This regional study is interesting, but there is insufficient space to include this level of detail.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9816	77	27			Mid century is vague: the mid of which century? [Pieter De Frenne, Belgium]	Rejected: it is clear that we mean the mid of the 20th century
10424	77	27	77	45	this section seems to bring to gether many different regional studies, butterflies in the UK, trees in norther china… is there a way to clearly indicate that this is only a range of examples and somehow frame a consistent pictuire (or state that evidence is too patchy to generate a common picture? Also, it isunclear which of the statements made earlier in the paragraph actually support the very last bit about the "maladaptation coming from the larger ssensitivity of many species to increases climate variability"? I think this has not been fleshed out in the evidence presented before. [Christopher Reyer, Germany]	Accepted- This section has been rewritten and shortened and the story line is now clearer.
1422	77	29			Should refer to 'higher trophic levels' [Karen Olsen, Denmark]	editorial (trophic)
6238	77	29			Should refer to 'higher trophic levels' [Anne Olhoff, Denmark]	editorial (trophic)
18336	77	29			Should refer to 'higher trophic levels' [Andrea TILCHE, Belgium]	editorial (trophic)
45602	77	29	77	29	In the sentence "for species of higher tropic level" shouldn't be trophic instead of tropic? [Adela M Sánchez-Moreiras, Spain]	editorial (trophic)
21992	77	32			Remove the comma in "Tansey et al., (2017)" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
16200	77	37	77	40	Remove, not relevant to the 1.5 C scenario. [Australia]	Accepted - Text was revised with the suggested edit
21994	77	39			remove space in 21 st --> 21st [LUIS VALDES, Spain]	Not applicable - This section was rewritten
101	77	40	77	41	In this sentence, the phrase 'except at range limits' is confusing and, I believe, misleading. If the intent of this phrase in the sentence is to say that phenological plasticity is always adaptive at range limits, then the citation used for this sentence (Duputie et al. 2015) contradicts the point trying to be made. Perhaps the sencence would be best left as saying that phenological placticity is not always adaptive. [Isaac Shepard, United States of America]	Not applicable - This section was rewritten. Section shortened and written with a clearer story line.
60410	77	40	77	45	Maybe cite the recent work of Macel et al. (Oecologia, June 2017, Volume 184, Issue 2, pp 543-554), where some experimental tests were run on this. [United States of America]	Accepted - Reference was added
7094	78		84		proof-reading is needed here - more intensive than in other parts… [Dmitry L. Musolin, Russian Federation]	Editorial - copyedit to be completed prior to publication
102	78	1	79	5	Somewhere in this section it may be worth discussing that, due to lags in the responses of some species to climate change, shifts in species ranges may result in novel assemblages with unknown implications for biodiversity and ecosystem function. (Rafferty, N.E. 2017. Effects of global change on insect pollinators: multiple drivers lead to novel interactions. Current Opinion in Insect Science 23:22-27; Gibson-Reinmer et al. 2015. Climate change creates rapid species turnover in montane communities. Ecology and Evolution 5:2340-2347; Semmartin et al. 2004. LItter quality and nutrient cycling affected by grazing-induced species replacements along a precipitation gradient. Oikos 107:148-160; Alexander et al. 2016. When climate reshuffles competitors: a call for experimental macroecology. Trends in Ecology and Evolution 31:831-841) [Isaac Shepard, United States of America]	Accepted- A sentence and a reference have been added to first paragraph of section 3.4.3.2
614	78	1	79	4	No a single mention to soil biodiversity and the fact that under warming soils would become hotter and drier and as a result, many soil organisms would die or be forced to migrate down (their dispersal capabilities are very low and therefore, their vulnerability is very high) to cope with these environmental changes. [Maria Jesus Iglesias Briones, Spain]	This an important issue, but there is no literature relating to 1.5/2C warming that relates to this issue, which should be discussed in full in AR6.
4702	78	1	79	4	This section about the impact of climate change on species, must give more examples and details about the extinction of flora and fauna. [Wael EL ZEREY, Algeria]	Accepted. A sentence has now been added to link projections of large range loss with increased extinction risks, although this is very difficult to quantify
10426	78	1	79	4	I think this section would follow logically after the biome shift section 3.4.3.1 [Christopher Reyer, Germany]	Rejected - The team decided to keep the flow as it was
10462	78	1	79	4	One paper about species range shifts under 1.5 and 2 °C warming by Christian Hof et al. And entitled "Combined future impacts of climate and land-use change for global vertebrate biodiversity under low and high warming scenarios" was submitted to the Chapter 3 scientist before the submission deadline and could be cited here. [Christopher Reyer, Germany]	Rejected- This paper could not be included since it is not yet published
12010	78	1			This section should also mention Smith et al. (2018), Phil. Trans. R. Soc. A who find that limiting warming to 1.5 degrees reduces the number of species facing loss of 50% of their range by 50% compared to 2 degrees of warming. Furthermore, they also find that 5.5-14% more of the globe can act as climatic refugia for plants and animals. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Reference was added, but cited in different subsection
28330	78	1	79	4	Please ensure that the analyses on changes in species range, abundance and extinction due to climate change also considers the outcomes of the IPBES global assessment on biodiversity and ecosystem services that is due to be finalized in May 2019 (see: https://www.ipbes.net/deliverables/2c-global-assessment). Note that the co-chair of this IPBES assessment is J. Settele, whose publications are being referred to in several sections of this report (e.g. 3.4.3.3 and 3.4.3.4.). [Germany]	Rejected- It is not appropriate to cite the IPBES before it is finalized.
34070	78	1	79	4	3.4.3.3 Changes in species range, abundance and extinction: Species can buffer range shifts (Lenoir et al 2015 Global Change Biol) and conserve their climatic niche. Trophic interactions may locally counteract range expansion of species towards higher altitudes (Bråthen et al 2017 Ecol Appl), please consider these and other references modifying the content of section 3.4.3.3. [Norway]	We have cited the Brathen paper, but there is not room for a more detailed discussion of these issues in this very short report.
41398	78	1	79	4	Same comment about using a more interesting way of presenting findings of the assessment. [Lourdes Tibig, Philippines]	The comment is not clear
28332	78	3	78	5	Please use an example that fits or adjust the numbers: 17 km poleward shift per decade add up to 65 km in 50 years, not 57. [Germany]	Accepted - Text was revised with the suggested edit
9820	78	4			Altitude/altitudinal is a wrong word in this context. It is best to use "elevation"/"elevational" throughout the text, See the paper by McVicar & Körner (2013) on this issue: Oecologia. 2013 Feb;171(2):335-7. doi: 10.1007/s00442-012-2416-7. Epub 2012 Aug 18. [Pieter De Frenne, Belgium]	Rejected
17460	78	4	78	4	Use formal abbreviations for SI and derived units, thoughout. [David Schoeman, Australia]	Accepted - Text was revised to ensure consistency throughout the report
6718	78	5	78	5	species in of the' should be' species in the' [Robert Shapiro, United States of America]	See response to comment # 21996
12062	78	5	78	5	remove the word 'in' near the end of the line: 976 species in of the … [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
21996	78	5			Remove "of" in "in of the" --> in the [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
60412	78	5	78	7	Wiens paper was evaluating contractions at 'warm edge', and most were animals moving latitudinally upslope. No plants were documented in moving northward latitudinally. Thus, the wording of this sentence is misleading. Also disagree that the Wiens paper found local extinctions 'especially in tropical regions', as the data are scant. [United States of America]	We somewhat disagree, as the abstract mentions: "This frequency of local extinctions was broadly similar across climatic zones, clades, and habitats but was significantly higher in tropical species than in temperate species (55% versus 39%), in animals than in plants (50% versus 39%), and in freshwater habitats relative to terrestrial and marine habitats (74% versus 46% versus 51%)." We have edited the sentence to make it more precise.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17462	78	6	78	6	The term "local extinctions" is emotive and misleading. The term "extirpation" would be far better here, and in several other places throughout the text. [David Schoeman, Australia]	Rejected- This term was accurately used, but there is a communication issue in that people who are not ecologists do not usually understand the meaning of the word 'extirpation'.
60414	78	9	78	13	The Thomas et al. (2004) paper is now considered out of date and not widely accepted by people working in this field. [United States of America]	Not applicable - This text was deleted
12064	78	10	78	10	Thomas et al (2004) was a prominent and arguable ground-breaking paper in its time, but it is now 18 years old, and moreover it received substantial criticism which is not recognized here. A more balanced view would be appropriate, especially since this paper was a major contributor to the AR4 statement on 20-30% of species at increasingly high risk of extinction if warming exceeds 2C as quoted on line 22-23 of this page. Please cite papers which critiqued Thomas et al (2004). Thuiller, W.; Araújo, M.B.; Pearson, R.G.; Whittaker, R.J.; Brotons, L.; Lavorel, S. (2004). "Biodiversity conservation: Uncertainty in predictions of extinction risk". Nature. 430 (6995): 1. doi:10.1038/nature02716. Araújo, M.B.; Whittaker, Robert J.; Ladle, Richard J.; Erhard, Markus (2005). "Reducing uncertainty in projections of extinction risk from climate change". Global Ecology & Biogeography. 14 (6): 529–538(10). doi:10.1111/j.1466-822X.2005.00182.x. Pearson, Richard G.; Wilfried Thuiller; Miguel B. Araujo; Enrique Martinez-Meyer; Llu?s Brotons; Colin McClean; Lera Miles; Pedro Segurado; Terence P. Dawson; David C. Lees (2006). "Model-based uncertainty in species range prediction" (PDF). Journal of Biogeography. 33: 1704–1711. doi:10.1111/j.1365-2699.2006.01460.x. Buckley, L. B; Roughgarden (2004). "Biodiversity conservation: Effects of changes in climate and land use". Nature. 430 (6995). doi:10.1038/nature02717. John Harte; Annette Ostling; Jessica L. Green; Ann Kinzig (2004). "Biodiversity conservation: Climate change and extinction risk". Nature. 430 (6995). doi:10.1038/nature02718. Botkin, Daniel B.; et al. (March 2007). "Forecasting the Effects of Global Warming on Biodiversity" (PDF). BioScience. 57 (3): 227–236. doi:10.1641/B570306 [United Kingdom (of Great Britain and Northern Ireland)]	We agree that this paper has been widely criticised, but included it because more recent information had not been located at the time. We have since removed this section of the paragraph to shorten the section and to focus on the scope of the report. We have provided, instead, a more recent perspective on levels of high range loss which are likely to provide good indicators of increased extinction risk.
21998	78	10			Remove empty space after "to" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
10812	78	11	78	11	Change to 'to be significantly greater…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
22000	78	11			insert space between "2004)to" [LUIS VALDES, Spain]	Not applicable - This text was deleted
30486	78	11	78	11	Typo: significantly [France]	Not applicable - This text was deleted
62514	78	11	78	11	Please widen the space between "2004)" and "to be signficantly" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This text was deleted
17464	78	13	78	13	Delete "the" [David Schoeman, Australia]	Not applicable - This section was rewritten
22002	78	14			insert space between "2006).IUCN" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
40298	78	14	78	16	Also, IUCN (2008) 108 terrestrial animal species in Egypt currently face major threats which will be augmented in the future due to the repercussions of climate change. (Reference: IUCN.(2008) International Union for Conservation of Nature and Natural Resources – IUCN.Sited :http//www.iucnredlist.org/static/stats). [Amal Hussein, Egypt]	Rejected- The IUCN reports are cited generally. It is not possible to focus on a single country.
44454	78	14	78	14	(Stephens et al., 2016).IUCN [Rita Man Sze Yu, China]	See response to comment # 22002
62516	78	14	78	14	Please widen the space between "(Stephens et al., 2016)." and "IUCN" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 22002
12066	78	17	78	17	remove the word 'the' at the end of the line [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised with the suggested edit
1424	78	22		42	Shorten the paragraph [Karen Olsen, Denmark]	Accepted- Paragraph was shortened.
6240	78	22		42	Shorten the paragraph [Anne Olhoff, Denmark]	Accepted- Paragraph was shortened.
12068	78	22	78	25	It seems odd to cite the AR4 statement on extinction risk, which was heavily influenced by a contested paper (Thomas et al 2004), and then also cite the AR5 chapter which provided an updated view of the same topic based on more recent literature than was available in AR4. It would make more sense to just cite the AR5 conclusion and then update it with post-AR5 literature. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted- We have revised the section as you suggested.
18338	78	22		42	need to shorten the paragraph [Andrea TILCHE, Belgium]	Accepted- Paragraph was shortened.
60416	78	22	78	42	Note the proportion of species that would see their ranges increase as a response to climate change (e.g., see Duan et al., PeerJ. 2016; 4: e2185.). Also, what would be the expectation of the response of invasives and vectors to changes in climate? [United States of America]	The literature that we have cited includes the potential for species ranges to move across the earth's surface and, depending on the species' ability to disperse, this could lead to either a smaller or a greater geographic range size. This is completely analysed in the Warren et al 2018 paper, which provides information about the small number of species whose ranges increase in response to warming. We now include this in this section, but we did not cite the paper you mentioned as it is specific to only one region whereas the new paper is global in scope. The issue of invasive species is important, but there is no literature about it relating to the specific question to be addressed in this special report on 1.5C warming.
12070	78	23	78	23	change brackets for the reference starting the new sentence- '(Settele….' [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
30488	78	23	78	23	Typo: Settele et al., (2014) [France]	Not applicable - This text was deleted
44456	78	23	78	42	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
45016	78	23	78	23	(Settele et al., 2014) --> Settele et al. (2014) [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
12072	78	25	78	42	This text usefully covers recent results that were not available in AR5. However there are a lot of numbers and all the detail does not seem necessary, especially since one or more studies cited here are apparently updates of the first one cited on line 25. This section could therefore be shortened and made more readable without losing any of its impact. [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised with the suggested edit
14090	78	25	78	42	Other caveats to these kinds of studies should be added here. Namely that they only look at the dispersal ability of species, but not evolvability. Also emphasize that these are correlational studies using species distribution modelling, and thus carry lots of uncertainty. [Nikhil Advani, United States of America]	The limited space does not permit a full discussion of the caveats, which are mentioned within the literature that has been cited. The two most important ones have now been included.
12074	78	32	78	32	reference needs to be completed - year missing [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Reference was edited
40300	78	32	78	32	The reference "(Warren a et al.)" was written without the years, please add submitted [Amal Hussein, Egypt]	Accepted - Reference was edited
60418	78	33	78	33	Don't say 'projected geographic range losses', use 'climatic range losses'. Also, the Warren study quoted is listed as 'submitted' so unable to evalulate the claims. [United States of America]	The correct term as used in the paper itself is 'climatically determined geographic range loss'. That term is now used and the paper is now accepted.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6720	78	35	78	36	confusion between data for 1.5C and 2.0C. 'This is reduced to 20±10% insects, 8±5% vertebrates, and 16±10% plants; and at 1.5°C to 9±6% insects, 4±3% vertebrates and 8±5% plants, at global warming of 2°C.' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
28334	78	35	78	35	This is reduced to 20±10% insects, 8±5% vertebrates reference is missing, and the positioning of 2°C seems incorrect. [Germany]	Accepted - Reference was added Not applicable - This section was rewritten
45606	78	35	78	36	The sentence "This is reduced to 20±10% insects, 8±5% vertebrates, and 16±10% plants; and at 1.5°C to 9±6% insects, 4±3% vertebrates and 8±5% plants, at global warming of 2°C" is written incorrectly. It should be "This is reduced to 20±10% insects, 8±5% vertebrates, and 16±10% plants at global warming of 2 °C; and to 9±6% insects, 4±3% vertebrates and 8±5% plants at global warming of 1.5 °C" [Adela M Sánchez-Moreiras, Spain]	Accepted - Text was revised with the suggested edit
60420	78	35	78	36	This sentence is backwards on 2 vs 1.5°C warming. [United States of America]	Accepted - Text was revised with the suggested edit
12076	78	40	78	40	re-wording required: 'study which that range…' [United Kingdom (of Great Britain and Northern Ireland)]	See response to comment # 16202
16202	78	40			study which that range losses at 1.5oC is grammatically incorrect. [Australia]	Accepted - Grammar was corrected
17466	78	40	78	42	This sentece needs editing for grammar [David Schoeman, Australia]	See response to comment # 16202
35436	78	40			Ecological monitoring of steppe vegetation in southwestern Algeria between 1978 and 2011 showed a decrease in plant species of -60%. Mediterranean species declined while Saharan species appeared. This migration of Saharan species towards the North is due to an aridification of the climate (Hirche & al, 2015) [Dalila NEDJRAOUI, Algeria]	Not applicable- This observation is mentioned already in the section.
137	78	41	78	41	missing year refrence [teodoro georgiadis, Italy]	Accepted - Reference was edited
12078	78	41	78	41	reference needs to be completed - year missing [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Reference was edited
22004	78	41			insert space between "warming(Smith" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
22006	78	41			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted - Reference was edited
32300	78	41			Year is missing from Smith et al. citation [Aaron Glenn, Canada]	See response to comment # 22006
32322	78	41	169	3	I already made the majority of these comments during my review of Chapter 3 for the First Order Draft and they were not addressed by the authors for the Second Order Draft. [Aaron Glenn, Canada]	Unclear what this comment refers to
35324	78	41	78	41	Add space before reference [Ana Bastos, France]	See response to comment # 22006
62518	78	41	78	41	Please widen the space between "warming" and "(Smith et al.)" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 22004
62520	78	41	78	41	Please verify this reference "(Smith et al.)"; the year is missing [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 22006
22008	78	42			replace "square km" by "km2" [LUIS VALDES, Spain]	Not applicable - This text was deleted
40302	78	42	78	42	the reference "Smith et al.): please add submitted [Amal Hussein, Egypt]	Accepted - Reference was edited
1426	78	44		49	It would be important to point out the difference between species being threatened by climate change because their habitats shift and species being threatened by species that might migrate into other areas because of climate change and outcompete previously dominant species [Karen Olsen, Denmark]	Not applicable - This text was deleted. This remark concerns a paragraph which was removed because of the necessity to shorten
6242	78	44		49	It would be important to point out the difference between species being threatened by climate change because their habitats shift and species being threatened by species that might migrate into other areas because of climate change and outcompete previously dominant species [Anne Olhoff, Denmark]	Not applicable - This text was deleted. This remark concerns a paragraph which was removed because of the necessity to shorten
17468	78	44	79	4	The jump from a very broad context in the paragraph above to the very narrow here is jarring. It needs a little preamble. [David Schoeman, Australia]	Not applicable - This text was deleted
18340	78	44		49	It would be important to point out the difference between species being threatened by climate change because their habitats shift and species being threatened by species that might migrate into other areas because of climate change and outcompete previously dominant species [Andrea TILCHE, Belgium]	Not applicable - This text was deleted. This remark concerns a paragraph which was removed because of the necessity to shorten
60422	78	44	78	47	maybe cite the work of Duan et al (PeerJ. 2016; 4: e2185), where an analysis of several amphibian species shows different responses, and how the potential survival of the species depends also on the fragmentation of the potential habitat across the ranges. [United States of America]	See response to comment # 60416
22010	78	45			Rephrase to avoid duplication of citation (Takano et al., 2017), which is repeated. Please note that the second reference reads as Takana, but it is Takano according to the list of references at the end. [LUIS VALDES, Spain]	Not applicable - This text was deleted
35950	78	45	78	45	One reference is quoted as Takano et al. The reference in next sentence is Takana et al. Needs to be rechecked. [India]	See response to comment # 22010
10428	78	47	78	49	this reads in a contradicting way as first Europe is mentioned where cork is important but then the area lost is in northern africa [Christopher Reyer, Germany]	Not applicable - This text was deleted
28336	78	47	78	49	Please check: Is 5% the correct number here? And if so, it appears that a loss of 5% of the distributional area is quite low in comparison to what is expected for other species and ecosystems, so please consider whether this example is an appropriate choice in this context, and clarify in the text why this example was chosen. [Germany]	Not applicable - This text was deleted
45608	78	47	79	1	The sentence refers to cork oak in Europe but talks about losses in northern Africa, is this statement right? [Adela M Sánchez-Moreiras, Spain]	Not applicable - This text was deleted
58566	78	47	78	49	There is a slight inconsistency in the text, which starts with "In Europe, cork oak is also a socio-economically important forest ecosystem…" but then proceeds to discuss impacts which are "mainly in northern Africa" [Paul Leahy, Ireland]	Not applicable - This text was deleted
45610	79				I find necessary to highlight in this section the few number of studies done in multi-stress conditions, which are characteristic of climate change (with strong biotic and abiotic pressure) but not usual in the literature. This makes more difficult to understand which the behaviour of the species will be under real climate change conditions. [Adela M Sánchez-Moreiras, Spain]	Whilst we agree, space does not permit a full discussion of the caveats associated with these kinds of studies here, although we now mention some key ones.
16204	79	1			Suggest discuss economic impacts in a section on agriculture. [Australia]	This will not be discussed in this section
35434	79	1			In North Africa (Morocco and Algeria) Atlas cedar dieback has been studied by many researchers who have shown that this dieback and the high rate of tree mortality observed are due to the drought and climate change that have. a negative impact on the physiological functions of trees (Slimani & al, 2014; Linares & al 2011) [Dalila NEDJRAOUI, Algeria]	This is included in the studies summarized in first paragraph of section 3.4.3.3
60424	79	3	79	4	The sentence "By constraining warming to 1.5°C, losses would be expected to be further reduced" contradicts the earlier statement that afforestation of new suitable areas could double present area (despite challenges). With that, the current sentence should either be removed or caveated. [United States of America]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
2208	79	7	79	7	In this section, I recommend to add a new section on 'soil response', because it can be substantially different from plant and animal responses. For example, Nishina et al. (2014) related the global soil carbon change with future temperature change. Reference: Nishina K, Ito A, Beerling DJ, Cadule P, Ciais P, Clark DB, Falloon P, Friend AD, Kahana R, Kato E, Keribin R, Lucht W, Lomas M, Rademacher TT, Pavlick R, Schaphoff S, Vuichard N, Warszwaski L, Yokohata T (2014) Quantifying uncertainties in soil carbon responses to changes in global mean temperature and precipitation. Earth System Dynamics 5: 197–209. DOI: 10.5194/esd-5-197-2014 [Akihiko Ito, Japan]	Rejected- Our objective is to shorten rather than to lengthen the section.
16206	79	7	79	35	It is not at all clear whether these "carbon storage" or "respiration" relate to above ground, below ground, biomass or soil. [Australia]	In most cases, it concerns the carbon sink at the scale of the ecosystems (above and below ground).
35150	79	7	79	7	Following study can be added under the section: Grass lands are important ecosystem as the provide a number of services. While analysing the impact of Climate change on services being provided by Rangeland ecosystem Boone et al. (2017) concluded that overall decrease is expected in the services provide by grassland ecosystem. By 2050 under RCP 8.5 scenario mean global annual net primary production (NPP) may decrease by 10 g C m?2 year?1, while herbaceous NPP is projected to increase with an average of 3 g C m?2 year?1 . These changes vary from place to place e.g. Large increase is expected in annual productivity in northern regions. In Canada and US productivity may increase by 21%, while western Africa may face serious declines i.e. nearly 46% in sub-Saharan western Africa and Australia's productivity may decrease by 17%. Moreover Soil organic carbon is expected to increase in central Asia (16%) , Australia (9%) and the Middle East (14%), and decline in many African savannahs i.e. nearly 18% in Sub-Saharan Western Africa. Similarly 7.5 to 9.6% decline in Livestock is expected with a serious economic loss of $9.7 to $12.6 billion Citation: Boone, R. B., Conant, R. T., Sircely, J., Thornton, P. K., & Herrero, M. (2017). Climate change impacts on selected global rangeland ecosystem services. Global change biology. [Shaukat Ali, Pakistan]	Rejected- This report focuses on 1.5°C global warming scenario.
10432	79	7	80	1	For this section it is unclear what framing was used to select the studies. It reads a bit like a loose connection of different studiesand a clear line of argumentation would really help the reader [Christopher Reyer, Germany]	The structure of this section is as follows: first we analyse present ecosystem productivity, present ecosystem respiration with a focus on the soil, projections with a focus on the disagreement between models, projections at 1.5°C and 2°C; the conclusion concerns the decrease of carbon storage with temperature increase.
10436	79	7	80	1	I miss reference to some important work on disturbances and extreme events such as Reichstein et al. 2013, Seidl et al. 2014 and Seidl et al. 2017 Reichstein, M., Bahn, M., Ciais, P., Frank, D., Mahecha, M. D., Seneviratne, S. I., Zscheischler, J., Beer, C., Buchmann, N., Frank, D. C., Papale, D., Smith, A. R. P., Thonicke, K., van der Velde, M., Vicca, S., Walz, A., Wattenbach, M. (2013). Climate extremes and the carbon cycle. Nature, 500, 287-295. doi:10.1038/nature12350. Seidl, R; Schelhaas, MJ; Rammer, W; Verkerk, PJ Increasing forest disturbances in Europe and their impact on carbon storage. NAT CLIM CHANGE. 2014; 4(9): 806-810. Seidl R, D Thom, M K, D Martin-Benito, M Peltoniemi, G Vacchiano, J Wild, D Ascoli, M Petr, J Honkaniemi, MJ Lexer, V Trotsiuk, P Mairota, M Svoboda, M Fabrika, TA Nagel, CPO Reyer (2017) Forest disturbances under climate change. Nature Climate Change 7:395–402 DOI 10.1038/nclimate3303 [Christopher Reyer, Germany]	Accepted- Reference Seidl et al 2017 has been added
34072	79	7	80	39	Please consider content from Huang et al 2017 NCC on velocity of temperature change vs velocity of productivity change; a tipping point for some parts of an ecosystem may occur while for another component of the ecosystem they might be a longer time-lag in response to temperature increase. [Norway]	Accepted - Reference was added
41400	79	7	81	15	Again, this is a review, not an assessment. [Lourdes Tibig, Philippines]	The conclusion of the section is clearly an assessment of carbon storage at 1.5°C versus 2°C
49958	79	7	80	49	Illustration or infografic will help to understand clearly the complexity of the impacts. [Perdinan Perdinan, Indonesia]	It was not possible to identify what was required
60426	79	7	84	38	Section 3.4.3 would benefit from an increased focus on how impacts under 1.5°C scenarios differ from 2°C scenarios and an inclusion of a clear indication of levels of confidence/uncertainties for statements throughout. [United States of America]	Accepted - Text was revised with the suggested edit
60428	79	7	79	21	This section (and others in Chapter 3) overlooks the well-documented impacts of the most extreme drought in the recent history of the Pacific U.S. states, from 2012-2015, which caused the mortality of tens of millions of trees in the Sierra Nevada Mountains and throughout California. This drought was concurrent with surface temperature warming trends and forest insect pest outbreaks that have changed the western U.S. landscape for decades to come. See the following peer-reviewed journal papers for more details and citations: Potter, C., 2017, Satellite image mapping of tree mortality in the Sierra Nevada region of California from 2013 to 2016, Journal of Biodiversity Management & Forestry, 6: 2. Potter, C., 2017, Fire-climate history and landscape patterns of high burn severity areas on the California southern and central coast, Journal of Coastal Conservation, doi: 10.1007/s11852-017-0519-3. Potter, C. and C. Dolanc, 2016, Thirty years of change in subalpine forest cover from Landsat image analysis in the Sierra Nevada Mountains of California, Forest Science, Volume 62, Number 6, pp. 623-632(10). [United States of America]	It is not referred to explicitly, but it is implicit in first paragraph of section 3.4.3.4
60430	79	8	80	11	This AR5 framing could be condensed substantially due to space considerations or completely removed. [United States of America]	Accepted - Text was revised with the suggested edit
6722	79	9	79	9	studies speculate that' should be 'studies speculating that' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
17470	79	9	79	9	Replace "speculate" with "speculating". [David Schoeman, Australia]	See response to comment # 6722
22012	79	9		41	Please review these lines and correct spaces between words (e.g. lines 9, 18, 40, 41) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
35326	79	9	79	11	Why is the word "speculate" used? There have been several recent studies trying to address this question, using both modelling and observation-based data. It is true that attribution is still uncertain, but it is unfair to use the word speculative. While the CO2 fertilization effect is the best candidate for the increase in the land sink over the past several decades (Keenan et al., 2016 DOI: 10.1038/ncomms13428; Piao et al., 2017 DOI: 10.1111/gcb.13909), the effect of temperature change may become incresingly important (Penuelas et al., 2017 DOI: 10.1038/s41559-017-0274-8), but this is still controversial (Ballantyne et al., 2016 doi:10.1038/nclimate3204; Zhu et al., 2018 DOI: 10.1002/2017GL075808). Nevertheless, efforts to disentangle gross primary productivity and ecosystem respiration from observation-based datasets should be mentioned (e.g. Li et al., 2018 DOI: 10.1002/2017GL076622). My suggestion is that the authors reformulate the writing to fit the AR uncertainty reporting, and avoid the use of terms as "speculative", which are unfair and may potentiate mistrust in the scientific community. [Ana Bastos, France]	Accepted - Text was revised with the suggested edit. "Speculate" was replaced with "conclude".

Comment No	From Page	From Line	To Page	To Line	Comment	Response
44458	79	9	79	18	Spacing issue in 3 places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
62522	79	9	79	9	Instead of writing "(Settele et al., 2014)(AR5-", please write "(Settele et al., 2014; AR5-" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 6722
17472	79	14	79	14	Replace "leafs" with "leaves". [David Schoeman, Australia]	Not applicable - This text was deleted
10814	79	17	79	17	Change to 'between 0.035 yr-1 to 0.0127 yr-1](Piao et al., 2015b). [Franklin Paredes, Brazil]	See response to comment # 32302
17474	79	17	79	18	Square braces appear here suddenly… [David Schoeman, Australia]	Not applicable - This text was deleted
32302	79	17			Replace "0035" with "0.0035". [Aaron Glenn, Canada]	Not applicable - This text was deleted
41596	79	17			Change "0035" to "0.0035"? [Czech Republic]	See response to comment # 32302
43220	79	17	79	17	What is LAI? [Edward Byers, Austria]	Not applicable - This text was deleted
60432	79	17	79	21	These sentences are disjointed, but important to make the point that extreme events can easily discount any increased productivity over time, especially in forests. [United States of America]	Not applicable - This text was deleted
1428	79	18		21	too general [Karen Olsen, Denmark]	Not applicable - This text was deleted
6244	79	18		21	too general [Anne Olhoff, Denmark]	Not applicable - This text was deleted
17476	79	18	79	21	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This text was deleted
18342	79	18		21	too general [Andrea TILCHE, Belgium]	Not applicable - This text was deleted
10430	79	20	79	21	This sentence about droughts and forests comes rather unexpected and is unreferenced. Or does it refer to the entence before? Should be made clear. In the context of forest dieback you could cite the paper by Allen et al. and Reyer et al. Allen, C.D., Macalady, A.K., Chenchouni, H., Bachelet, D., McDowell, N., Vennetier, M. et al. (2010) A global overview of drought and heat-induced tree mortality reveals emerging climate change risks for forests. Forest Ecologyand Management, 259, 660–684. Reyer CPO, N Brouwers, A Rammig, B Brook, J Epila, RF Grant, M Holmgren, F Langerwisch, S Leuzinger, W Lucht, B Medlyn, M Pfeiffer, J Steinkamp, M Vanderwel, H Verbeeck, D Villela (2015) Forest resilience and tipping points at different spatio-temporal scales: approaches and challenges. Journal of Ecology 103:5-15 DOI: 10.1111/1365-2745.12337 [Christopher Reyer, Germany]	Not applicable - This text was deleted
2224	79	21	79	21	Here, I recommend to clarify that ecosystem responses can be non-linerar against global temperature rise. For example, Tanaka et al. (2017) showed that terrestrial risk phenomena such as wildfire would increase in non-linear manners, especially at regional level. Reference: Tanaka A, Takahashi K, Shiogama H, Hanasaki N, Masaki Y, Ito A, Noda H, Hijioka Y, Emori S (2017) On the scaling of climate impact indicators with global mean temperature increase: a case study of terrestrial ecosystems and water resources. ClimChan 141: 775–782. DOI: 10.1007/s10584-017-1911-6 [Akihiko Ito, Japan]	Accepted- We have added a sentence on that at the end of the section.
58568	79	23	79	24	This sentence might be misinterpreted: "WGII AR5 concluded that deforestation has slowed over the last decade (even if this is now reversing)…". It could be inferred that the total deforestation is now reversing, rather than the change in the rate of deforestation that is reversing [Paul Leahy, Ireland]	Not applicable - This text was deleted
28338	79	25	79	26	Land Degradation and Desertification also lead to losses in soil and soil organic carbon (see for instance: http://www2.unccd.int/sites/default/files/documents/2015_PolicyBrief_SPI_ENG_0.pdf). Therefore, please consider to expand the following sentence (see inclusion in CAPITAL LETTERS): "… vulnerable to loss to the atmosphere as a result of rising temperature, drought, LAND DEGRADATION AND DESERTIFICATON, pests, storms, and fire ..." [Germany]	Accepted. "land degradation" has been added
32304	79	26	79	28	This reference actually indicates that global NEE and TER variability has increased due to nighttime temperature increases and that higher TER correlates with nocturnal warming in the tropics. Suggest rewording this sentence as something like "Anderegg et al. (2015) show that the total ecosystem respiration, at the global scale, has increased in response to increase of nighttime temperature in the tropical regions." [Aaron Glenn, Canada]	Accepted - Text was revised with the suggested edit
45018	79	27	79	28	I think this sentence is misleading. Ecosystem respiration decreases carbon stock in ecosystem and releases carbon into the atmosphere, and this ratio usually increases with temperature rise. [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
35152	79	28	79	28	The spacing is missing between the words "nighttime" [Shaukat Ali, Pakistan]	Rejected - Used as that by the author (Anderegg et al 2015)
41598	79	28			Change "Pg C / year /°C" to "Pg C yr-1 °C-1" [Czech Republic]	Accepted - Text was revised with the suggested edit
16208	79	29	79	33	Reference to change in fire regimes in Australia would help enhance southern hemisphere referencing: Bradstock R, Penman T, Boer M, Price O, Clarke H (2014) Divergent responses of fire to recent warming and drying across south-eastern Australia. Global Change Biology 20, 1412-1428. [Australia]	Reference not added due to obligation to shorten the text.
17478	79	29	79	35	Maybe outline the mechanism first, then move to the consequences? [David Schoeman, Australia]	Not applicable - This section was rewritten
45020	79	30	79	30	anthopogenic-->anthropogenic [Hiroaki Kondo, Japan]	Accepted. Word has been corrected.
17480	79	34	79	34	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This text was deleted
616	79	37	79	46	This whole paragraph needs to be re-written since it refers to many systems (peatlands & tropical forests in the first couple of lines (37-38), agro-ecosystems (42), boreal forest (44) and boreal peatlands (45)!! and it is difficult to understand if the point you are trying to make refers to one, some or all of them. Actually all peatlands (covering only 3% of the global surface) are on risk of releasing the vast amounts of C they store. [Maria Jesus Iglesias Briones, Spain]	Accepted- Section has been re-organised and shortened.
16210	79	37	79	46	There should be a much more thorough discussion of land management as a potential modifier of climate change effects. Suggest there is too much focus on (natural ?) forest and little consideration of managed land. [Australia]	The scope of the section does not include managed lands (see 3.4.6).
41600	79	37			Cahnge"PgCyr-1" to "Pg C yr-1" [Czech Republic]	See response to comment # 41598
45022	79	37	79	37	PgCyr-1 --> PgCyr-1 [Hiroaki Kondo, Japan]	See response to comment # 41598
46096	79	37	79	38	Yang et al. (2015) showed a reduction of the carbon sink of global terrestrial ecosystems by 0.57 PgCyr-1 in ecosystems with high carbon storage, such as peatlands and tropical forests. To my understanding this number refers only to carbon losses due to fire! Should be mentioned. [Tim Rixen, Germany]	Accepted - Text was revised with the suggested edit
58570	79	37	79	38	Spacing: Pg C yr-1 [Paul Leahy, Ireland]	Accepted - Text was revised with the suggested edit
10434	79	39	79	39	the bit on forests being an "adaptation tool" is very condensed and it doesn't become clear why the forests are an adaptation tool. I am also wondering if "adaptation tool" is really the right wording for discussing the regulating ecosystem service role of forests. [Christopher Reyer, Germany]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6724	79	40	79	40	forcarbon' should be 'for carbon' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
10816	79	40	79	40	Change to 'compartment for carbon sequestration…' [Franklin Paredes, Brazil]	See response to comment # 6724
30490	79	40	79	40	Typo: for carbon [France]	See response to comment # 6724
44460	79	40	79	41	Spacing issue in 3 places [Rita Man Sze Yu, China]	See response to comment # 62524
45024	79	40	79	40	forcarbon-->for carbon [Hiroaki Kondo, Japan]	See response to comment # 6724
62304	79	40	79	41	spacing before and after parenthsis. [Go Eun Park, Republic of Korea]	See response to comment # 62524
62524	79	40	79	40	Please widen the space between "sequestration" and "(Lal, 2014" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
49198	79	41	79	42	The comment that some productivity can be retained in soils to "offset emissions" and enhance resilience - this is not relevant for this chapter. Chapter 3 should not be used to discuss offsetting. [Bill Hare, Germany]	Not applicable - This text was deleted
62526	79	41	79	41	Please widen the space between "(Bispo et al., 2017)" and "and" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
16212	80	1	80	11	This paragraph is very ambiguous. Variously states a proven increase in land carbon sink and reduced carbon sink. [Australia]	This paragraph describes a trade-off between a sink due to elevated CO2 and subsequent consequences of changes in climate which may reduce the sink. The net balance of these effects is not well understood, as is described in the rest of this section.
60434	80	1	80	2	Should the first line read "disagreement" or "agreement"? Suggest rephrasing for clarity. [United States of America]	Rejected - The meaning is clearly that the disagreement between models reflect the diversity of scenarios
61886	80	1	90	40	Unfortunately, there is a lack of integration with the earlier parts of the report. It is clear for biomes (e.g. box on tipping points) ; it is also obvious for tropical cyclones (already assessed earlier), drought etc. [Valérie Masson-Delmotte, France]	The box on tipping points is removed; we have added a reference to section 3.3 in 3.4.3.5.
16214	80	4	80	5	Nutrient limitation is mentioned as a limit to increase in the carbon sink associated with rising CO2. Precipitation also limits productivity - how will response be influenced by decreasing precipitation, which is particularly important in parts of the Southern Hemisphere? [Australia]	Precipitation is included in climate.
44462	80	6	80	31	Spacing issue in 4 places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
22014	80	10		31	Please review these lines and correct spaces between words (e.g. lines 10, 15, 20, 31) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
41402	80	13	80	14	Refrain from using "published literature".. [Lourdes Tibig, Philippines]	Rejected - this is clearly based on published literature
28340	80	13	80	39	Please clarify the significance of these paragraphs. GPP will increase - ceteris paribus - if temperature and [CO2] increase. So if the feedback loop of scenario is forced to give an increase in [CO2] of 1% per year, the attribution of C to various pools and other processes generating emissions of C have to yield this increase in C AND a specific increase in temperature. Concentrating on GPP may lead to biased estimates, because the really important aspects are NBP and the fate of harvests carbon in wood. [Germany]	This section is about ecosystem function as well as carbon stocks. The response of carbon stocks is clearly important, but is dependent on the rate of change of climate as well as the overall level - for example, achieving 2 degrees over a century would give a different carbon uptake to achieving this over a decade. Hence, the focus is on the productivity which responds much more quickly and is therefore less influenced by the pathway to a given temperature. The role of harvest, and land-use in general, is also important. Land-use is covered in section 3.6 and in a cross-chapter box.
28342	80	17	80	19	Different scenarios will have different (underlying) management assumptions, thus different composition of e.g. vegetation and different treatment of e.g. vegetation and this, over time, sure has implications for GPP (see SR LULUCF, chapter 1.3 for reference). Using GPP may equally produce skewed outcomes, and the influence of scenarios should be discussed. [Germany]	Different scenarios certainly do have very different underlying assumptions and as such are not directly related to a given level of global temperature change. Land-use is covered in section 3.6 and a cross-chapter box.
1430	80	20		26	This means that land use is the bigger driver and that should be said squarely [Karen Olsen, Denmark]	Not applicable - This text was deleted
6246	80	20		26	This means that land use is the bigger driver and that should be said squarely [Anne Olhoff, Denmark]	Not applicable - This text was deleted
6726	80	20	80	20	CO2is' should be 'CO2 is' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
10818	80	20	80	20	Change to 'atmospheric CO2 is prescribed to increase….' [Franklin Paredes, Brazil]	See response to comment # 6726
17482	80	20	80	20	Subscript the 2 in CO2. Check and correct, thoughout. [David Schoeman, Australia]	See response to comment # 6726
18344	80	20		26	This means that land use is the bigger driver and that should be clearly stated [Andrea TILCHE, Belgium]	Not applicable - This text was deleted
35154	80	20	80	20	The spacing is missing between the words "CO2is" [Shaukat Ali, Pakistan]	See response to comment # 6726
45026	80	20	80	20	CO2is-->CO2 is [Hiroaki Kondo, Japan]	See response to comment # 6726
62306	80	20	80	20	CO2is' ->'CO2 is', '2' should be subscript. [Go Eun Park, Republic of Korea]	See response to comment # 6726
4316	80	22	80	25	Please double check AR5 WGI report, which described biophysical effects of land-use on regional and local climate, with range of uncertainty. Clearly, land-use not only affect land carbon storage, but also provide biophsical forcing. [Gensuo JIA, China]	Accepted. It is true that land-use and management have biophysical as well as biogeochemical effects. No change in text is required here. Land-use is covered in section 3.6 and a cross-chapter box
16216	80	23	80	26	Should refer to land management in addition to just land use. Numerous references possible but Minasny et al 2017 suitable as already referred to on p.79 line 40. The role of differing land mangement strategies in carbon storage is not referred to anywhere in whole report [Australia]	Accepted. Land-use and management are both important. Land-use is covered in section 3.6 and a cross-chapter box
22016	80	23			Insert "it" in "but is" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
58572	80	24	80	26	Analysis of model results that include both climate change and land use change are difficult to interpret in terms of the roles of the individual drivers. Are there any studies in the literature of the impacts of the individual drivers? (However, I am not aware of any) [Paul Leahy, Ireland]	There are many such studies that separate climate, CO2 and land-use effects on carbon storage. For example Brovkin et al (2013, J. Climate) look at simulations with and without land-use. This is not cited here because the focus of this SR is not on land-use. The reason we present GPP results from idealised 1% simulations from CMIP5 is to separate climate from land use.
58574	80	28	80	39	The focus must be on fluxes rather than carbon store -- this is reasonable. However, GPP only tells part of the story of changes in storage. Total ecosystem respiration (TER) is equally important, yet this is only given a very small mention on line 32 ("could be offset ... by increases in decomposition"). Furthermore, decomposition is only part of TER as autotrophic respiration contributes to this too. [Paul Leahy, Ireland]	This is true, but length restrictions preclude showing multiple versions of these results. We felt GPP is the more important flux to demonstrate as this is indicative of ecosystem functioning as well as carbon stores.
41602	80	37			Add explanation of abbreviation "GPP" - Gross Primary Production [Czech Republic]	Accepted - Text was revised with the suggested edit
1432	80	40		44	Good [Karen Olsen, Denmark]	This paragraph has been moved to section 3.3
6248	80	40		44	Good [Anne Olhoff, Denmark]	This paragraph has been moved to section 3.3
9390	80	41	80	44	Thawing of permafrost doesn't necessrily mean thawing carbon. It depends on whether there is any organic material and there are significant areas in the Arctic where permafrost consists of shattered bedrock, bedrock and mineral soils with little or no organic matter. [Sharon Smith, Canada]	This paragraph has been moved to section 3.3
17484	80	41	80	44	How is permafrost avoidded? Awkward wording, revise. [David Schoeman, Australia]	Accepted - A difference of 0.5°C enable to avoid 2 million km2 of permafrost thawing.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
45612	80	41	80	44	I suggest including here the data of Schuur et al. (2015), who suggested that 130-160 billion tons of carbon could be released from melting permafrost during the next 80 years (Schuur et al., 2015). [Adela M Sánchez-Moreiras, Spain]	This paragraph has been moved to section 3.3
46880	80	41	80	41	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	This paragraph has been moved to section 3.3
60436	80	42	80	43	A word may be missing: Observational constraints suggest limiting global warming to 1.5°C would avoid (THAWING?) approximately 2 million km2 of permafrost compared with stabilization at 2°C." [United States of America]	See response to comment # 17484
16218	80	43			would avoid approximately 2 million km2 of permafrost should instead be "would avoiding the melting of 2 million km2 of permafrost" [Australia]	This paragraph has been moved to section 3.3
46736	80	44	80	44	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	This paragraph has been moved to section 3.3
55794	80	44			Also include Burke et al 2018, reference in cell I18, above. [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been moved to section 3.3
5604	81				I think that more dark coulours of the graphs will be better as for example the light yellow line is difficult to see clearly… [Sandra CASSOTTA, Denmark]	Rejected - I am not sure that it is important to follow the models individually
46904	81	2	81	10	Graphs would benefit from a visual colour key explaining the different colours (in addition to the description text of the figure). [Sarah Connors, France]	We considered this, but decided not to do so as it may clutter the figure. It is not central to the results which line represents which model.
62528	81	2	81	3	Is it possible to improve the figure 3.18? [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Quality of figures was improved
10820	81	12	81	12	Change to 'China acted as a small carbon sink in the…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
12080	81	12	81	12	need a gap between 'small' and 'carbon' [United Kingdom (of Great Britain and Northern Ireland)]	See response to comment # 10820
16220	81	12	81	15	Not clear whether this discussion relates to biomass, soil or both. [Australia]	Not applicable - This text was deleted
22018	81	12		27	Please review these lines and correct spaces between words (e.g. lines 12, 17, 27) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
32306	81	12	81	13	Replace "found" with "modelled". I also suggest replacing "acted as small carbon sink" with "were carbon neutral". I don't think 11.25 g/m^2/a is significantly different from 0, especially with that interannual variability reported and uncertainty with both the model and underlying validation measurements used (r^2 value of 0.571 for NPP, Fig. 3; r^2 ranging from 0.31 to 0.57 for eddy covariance measurements, Fig. 4). [Aaron Glenn, Canada]	Not applicable - This text was deleted
35156	81	12	81	12	The spacing is missing between the words "2013)found and smallcarbon" [Shaukat Ali, Pakistan]	See response to comment # 10820
44464	81	12	81	27	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
45028	81	12	81	12	smallcarbon --> small carbon [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
62530	81	12	81	12	Please widen the space between "(2013)" and "found" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 10820
2212	81	13	81	16	Boreal forests will undergo more or less severe wildfires in the future (except human prevention). I recommend adding more sentences about the wildfire disturbance with several references. [Akihiko Ito, Japan]	Not applicable - This text was deleted
41604	81	13			The words "million hectares" is not consistent with the report. The km2 or Mha is used, km2 is best. [Czech Republic]	Not applicable - This text was deleted
43614	81	17	81	18	One more reference to support this statement saying the interactive perspective of tropical cyclone and forest phenology (Hong and Hong, 2016) [Jinkyu Hong, Republic of Korea]	Rejected - I think that a reference to AR5 is enough here
53126	81	17	81	28	Kerkhoven and Gan (2013) estimated differences between the potential impact of climatic change to the Athabasca River basin (ARB) and Fraser River basin (FRB) of Canada with and without considering shifts in vegetation patterns induced by climate change and how much the difference will depend on vegetation types and climate. The hydrologic effects of vegetation shifts on ARB and FRB were estimated by applying the Mapped Atmosphere–Plant–Soil System (MAPSS) simulated results based on the Intergovernmental Panel on Climate Change's First and Second Assessment Report general circulation model (GCM) scenarios to the modified Interaction Soil–Biosphere–Atmosphere (MISBA) scheme. According to MAPSS, vegetation shifts in mountainous regions of FRB are expected to be dominated by conifer/broadleaf competition, while in ARB, climate projections of MAPSS predicted a southern expansion of the boreal forest. Because of differences in sublimation, there is a tendency for more snow to accumulate in open grassland than forests. Furthermore, changes to simulated mean annual maximum snowpack, runoff, and basin area covered by grassland are positively correlated to each other. Generally, a 4% increase in snow water equivalent (SWE) results in a 1% increase in mean annual runoff. These relationships hold true in both basins over a wide range of GCM-projected climate conditions and vegetation responses, suggesting that most changes in mean annual flow can be attributed to changes in SWE. Because of the different modeling approaches between MAPSS and MISBA, it seems that the treatment of these processes in vegetation and hydrologic models should be similar before conclusions can be drawn from various stand-alone simulations. Kerkhoven, E., and T.Y. Gan, 2013, Differences in the Potential Hydrologic Impact of Climate Change to the Athabasca and Fraser River Basins with & without Considering the Effects of Shifts in Vegetation patterns Caused by Climate Change, Journal of Hydrometeorology, 14(3), 963-976. DOI: 10.1175/JHM-D-12-011.1. [Thian Gan, Canada]	This seems too complicated (largely methodology) to be taken into account in this special report.
62532	81	17	81	17	Please widen the space between "outbreaks" and "outbreaks" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 22018
16222	81	19	81	21	Statements regarding fire frequency are in conflict with those on P82 Line 45. [Australia]	Accepted- Both statements have been merged and conflict removed.
62534	81	19	81	19	It seems the space before "The" is to wide… If yes, it should be shorten. [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
17486	81	20	81	20	N America? [David Schoeman, Australia]	See response to comment # 41606
40304	81	20	81	20	N America -----> "North America" [Amal Hussein, Egypt]	See response to comment # 41606
41606	81	20			Change "N America" by "North America" or "N. America" to be consistent in whole Report [Czech Republic]	Accepted - Text was revised with the suggested edit
57020	81	20	81	20	North America instead of "N America"? [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
49200	81	21	82	1	This paragraph is confusing for the reader in how it references temperature rises. It should be made consistent with how paragraphs cover warming. [Bill Hare, Germany]	Rejected- Paragraph seems clear
28344	81	27	82	1	This sentence is used again at page 82, lines 44 - 46. Please delete at one point. [Germany]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
28346	81	27	82	46	The sentence "Romero-Lankao et al. (2014,Box 26-1) indicate significantly lower wildfire risks in North America for near term warming (2030-2040, which may be considered a proxy for 1.5ºC) than at 2ºC." seems to be at odds to the literature, where an increase in fire risk is reported. Please check and verify that the quote is correct, and if it is, please explain this finding. [Germany]	Rejected- Statement seems correct
62536	81	27	81	27	Instead of writing "(2014)(Box 26-1)", please write "(2014; Box 26-1)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
16232	82		82		Please be complete and consistent. For Vardoukis et al 2014, please provide impact of warming on reduced mortality from cold - do not just include estimates of effects of the increase in the number of hot days. [Australia]	Not applicable - This text was deleted
17836	82		83		Forest-related contents is not enough. Explanation from just some articles does not cover divers aspect of forest. Forest area change, forest cover change, changes of carbon and biomass in forest, risk forest disaster should be dealt with in relation to warmin to 1.5 and 2.0. And some explanation in relation to LULUCF can be better added. [Republic of Korea]	Forest area/cover changes are related to biome shifts (see section 3.4.3.1), biomass changes are dealt with in section 3.4.3.4 and forest disaster risk is dealt with in section 3.4.3.5
17488	82	1	82	1	Add a paragraph break [David Schoeman, Australia]	See response to comment # 22020
22020	82	1		2	Insert one empty line between 1 and 2 [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
62538	82	1	82	2	Between line 1 and 2, please add space [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 22020
9434	82	2	82	8	Some regions in which vulnerable systems exist are listed according to AR5. Then, it is concluded: 'In all these systems, impacts accrue with greater warming. Consequently, impacts at 2°C would be expected to be greater than those at 1.5°C (medium confidence)'. However, there is nothing about 1.5C warming in AR5! How can the second part of the statement be derived from the first one? [Russian Federation]	It is based on a linear relationship
35158	82	2	82	2	2 in CO2 should be subscripted. [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
44466	82	2	82	2	Line spacing between Lines 1 and 2 [Rita Man Sze Yu, China]	See response to comment # 22020
16224	82	3	82	14	This section dwells exclusively on natural systems. The list of "forest" tyoes is incomplete. The extensive wet sclerophyl forests of ustralia will be under threat. They are not rainforest. Also - what of agro-ecosystems ? [Australia]	The sentence is more general than this comment implies, covering from sclerophyl forests to rainforests. Agrosystems are not included in this section.
28348	82	12	82	14	So the world's population living on drylands will suffer from emission primarily from humid lands, especially due to decreased crops, water resources and malaria transmission - Please clarify language in this sentence as well as the chain of cause and effect between emissions impacts, and add references to substantiate the claimed impact. [Germany]	Not applicable - This text was deleted
60438	82	12	82	14	The conclusion of this paragraph is general and not put in the context of 1.5°C. It should be removed or caveated. [United States of America]	Not applicable - This text was deleted
34074	82	18	84	15	3.4.3.5.1 - 3.4.3.5.3: Please consider to review for consistency the use of references. 3.4.3.5.3. has considerably more detail in use of references than 3.4.3.5.1. [Norway]	Accepted- References for Arctic ecosystems have been enriched.
62920	82	18	82	39	The parapgraph and effects of observed changes should be organized according to major components which defines ecosystems: A- Biotopes (= T°C and seasonality processes, rain and snow precipitations, permafrost and related cryosphere) B- Vegetal communities (L.22 "[...] facilitate conditions for woody species establishment in tundra areas...[...]) C- Animal communities (L.19 "Seven of 19 sub-populations of the polar bear...[...]"). Such organisation would enhance in the same time the comment and the reading process. I would then have move the sub-paragraph concerning perigracial processes (from line 30 to line 33) firstly, before floristic and faunistic communities observed changes. [Romain Courault, France]	Not applicable - This section was restructured
62922	82	18	82	19	According to AR5 (Settele et al., 2014) the High Arctic region, with tundra dominated landscapes, ha warmed more thant the ghlobal average over the last century : this specific sentence is litteraly found in the Chap 4, WG II, AR 5 (Settle et al., 2014). Quantifying would reinforce the comment (how much degrees the surface temperature of High Arctic region has been observed, compared to global mean? e.g 1901-2012, Figure SPM.1, Climate Change 2014: Synthesis Report) [Romain Courault, France]	This is presented in section 3.3
9822	82	19			Why is the word 'sub-population' used here (and not simply population)? [Pieter De Frenne, Belgium]	Not applicable - This text was deleted
22022	82	19		49	Please review these lines and correct spaces between words (e.g. lines 19,21, 25, 44, 49) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
34076	82	19	82	20	The only statement on Arctic marine animals is unreferenced and probably incorrect on page 82, line 19-20M. The text reads that "seven of 19 sub-populations of the polar bear are declining in number." According to the new CAFF SAMBR "statistics" for polar bear stocks, 1 is increasing, 5 are stable, 1 is decreasing and 12 are unknown. Please consider to use SAMBR to a greater extent in the IPCC work. It is high quality and up-to-date. [Norway]	Not applicable - This text was deleted
44468	82	19	82	49	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
62928	82	19	82	20	Linked to the 2nd comment, I woud have add at the beginning of the following expression "For higher ecosystemic levels such as carnivorous, it has been shown that…" [Romain Courault, France]	Not applicable - This text was deleted
17490	82	21	82	28	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This section was rewritten
34078	82	21	82	22	Please consider add a few words about biotic modification of climate impact on woody encroachment, e.g. Bråthen et al 2017 Ecol Appl. [Norway]	This is not necessarily an important point to be included given the restricted space
62540	82	21	82	21	Please widen the space between "degradation" and "(Bring et al., 2016;" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
34080	82	22	82	28	Please consider to add content from circumpolar phenology study from the ITEX network (Obernbauer et al) and consider adding to importance of snow from the ABA terrestrial ecosystems chapter or references therein. The changes in snow regime are more far-reaching than the current text gives the impression of. [Norway]	It is mentioned in section 3.4.3.1
62924	82	22	82	25	It seems that one word is missing in this specific sentence "Mortenson et al. (2014) indicate […] predators, zooplankton" : "[…]that among the 114 abiotic, performance and phenological variables related to several tens of taxa […]". The above expression "114 abiotic" appears to be incomplete [Romain Courault, France]	Not applicable - This text was deleted
62542	82	25	82	25	Please widen the space between "zooplankton)." and "Cooper (2014)" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62926	82	26	82	28	Long-term absence of snow […] (Blume-Werry et al., 2016). This sentence might be interpreted as going against the hpothesis of woody species establisment. That said, it has been prooved, in particular in Scandinavia, that shrubification processes are currently occuring. I suggest here to strengthen the whole paragraph understanding by using the concepts of "borealization" (here understood as coniferous treeforests and treelines latitudally and altitudally advancing, as well as related floristic and faunistic communities) and "shrubification" concerning mid to high altitudes/sub-arctic scrubs (here understood as densification and intense colonization of competitive woody species). As a summary of impacts of climate change on tundra ecosystems, I suggest this reference : Wrona, F. J., Johansson, M., Culp, J. M., Jenkins, A., Mård, J., Myers?Smith, I. H., ... & Wookey, P. A. (2016). Transitions in Arctic ecosystems: Ecological implications of a changing hydrological regime. Journal of Geophysical Research: Biogeosciences, 121(3), 650-674. [Romain Courault, France]	Sentence removed as borealization is mentioned at the beginning of the paragraph (establishment of woody species in tundra areas):
31056	82	28	82	28	a better reference than the Arctic Report Card is the Arctic Councils recently released AACA assessment. [James FORD, Canada]	Not applicable - Reference has been removed from the last version
2206	82	30	82	33	In terms of the response of Arctic terrestrial ecosystems to future global warming, Ito et al. (2017) conducted a systematic analysis using a framework of ISI-MIP, including RCP2.6-based scenarios. Reference: Ito A, Nishina K, Noda HM (2016) Impacts of future climate change on the carbon budget of northern high-latitude terrestrial ecosystems: an analysis using ISI-MIP data. Polar Science 10: 346–355. DOI: 10.1016/j.polar.2015.11.002 [Akihiko Ito, Japan]	This level of detail can be covered in AR6 as space precludes it here.
22024	82	30			Modify the citation "(Aalto et al., 2017)" by "Aalto et al. (2017)" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
57022	82	32	82	32	Missed a half bracket here. [Xiaolin Zhang, China]	Accepted - Text was revised with the suggested edit
6728	82	35	82	35	caused decreased' should be ' decreased' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
8352	82	35	82	35	'the Qinghai-Tibet Plateau' should be 'the Tibetan Plateau' for consistency. [China]	Not applicable - This text was deleted
12082	82	35	82	39	How did the changes in human activity compensate for the negative effects of climate? Be specific [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
16226	82	35	82	39	This short paragraph illustrates the potential of land use and management to mitigate Climate Change effects. This needs much more substantial discussion. [Australia]	Not applicable - This text was deleted
17492	82	35	82	39	This whole paragraph needs careful editing. [David Schoeman, Australia]	Not applicable - This text was deleted
35160	82	35	82	35	Following relevant study is to be cited: according to Boone et al. (2017) in 2050 under RCP 8.5 scenario mean global annual net primary production (NPP) may decrease by 10 g C m?2 year?1, while herbaceous NPP is projected to increase with an average of 3 g C m?2 year?1 . These changes vary from place to place . Citation: Boone, R. B., Conant, R. T., Sircely, J., Thornton, P. K., & Herrero, M. (2017). Climate change impacts on selected global rangeland ecosystem services. Global change biology. [Shaukat Ali, Pakistan]	Not applicable - This text was deleted
45030	82	35	82	36	1.2gCm-2yr-1 --> 1.2gCm-2yr-1 [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
45032	82	36	82	36	-92gCm-2yr-2 --> -92gCm-2yr-1 Is 'yr-2' right? [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
30492	82	38	82	38	Typo: degradation ? [France]	Not applicable - This text was deleted
40306	82	38	82	38	degradion -----> "degradation" [Amal Hussein, Egypt]	Not applicable - This text was deleted
62544	82	38	82	38	Instead of writing "number) (Chen et al. 2014", please write "number; Chen et al. 2014" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This text was deleted
10440	82	42	83	17	I miss here statemetns about temperate forests, even though there are many projections in Europe and the US. E.g. Reyer CPO, S Bathgate, K Blennow, JG Borges, H Bugmann, S Delzon, SP Faias, J Garcia-Gonzalo, B Gardiner, JR Gonzalez-Olabarria, C Gracia, J Guerra Hernández, S Kellomäki, K Kramer, MJ Lexer, M Lindner, E van der Maaten, M Maroschek, B Muys, B Nicoll, M Palahi, JHN Palma, JA Paulo, H Peltola, T Pukkala, W Rammer, D Ray, S Sabaté, MJ Schelhaas, R Seidl, C Temperli, M Tomé, R Yousefpour, NE Zimmermann, M Hanewinkel (2017) Are forest disturbances amplifying or canceling out climate change-induced productivity changes in European forests? Environmental Research Letters or Reyer CPO (2015) Projections of changes in forest productivity and carbon pools under environmental change – A review of stand scale modeling studies. Current Forestry Reports 1:53-68. DOI: 10.1007/s40725-015-0009-5 or Reyer CPO, P Lasch-Born, F Suckow, M Gutsch, A Murawski, T Pilz (2014) Projections of regional changes in forest net primary productivity for different tree species in Europe driven by climate change and carbon dioxide. Annals of Forest Science 71:211-225 DOI 10.1007/s13595-013-0306-8 but also Seidl, R; Schelhaas, MJ; Rammer, W; Verkerk, PJ Increasing forest disturbances in Europe and their impact on carbon storage. NAT CLIM CHANGE. 2014; 4(9): 806-810. and there are many at country scale [Christopher Reyer, Germany]	Accepted- A sentence and the reference Reyer et al (2017) have been added.
17704	82	42	83	8	Please deal with the following: Due to climate change many forests in the world are declining and experiencing dieback as reported in AR5.For example events of Korean red pine dieback have been increased during last decades by warm temperature and drought in winter and spring in Korea. The heat and drought stress may exerbate insects and pest outbreaks. [Republic of Korea]	This reference is included by way of the AR5 chapter of Settele et al 2014
9824	82	43	83	16	Increasing intensities of storms is a cause, and not an impact on forests and woodlands, and is thus not really comparable to wildfires and pest outbreaks. This could be replaced by large-scale drought stress, wind throw and changing growth and community composition of dominant trees, No mention is made in this paragraph on temperate forests. [Pieter De Frenne, Belgium]	Unclear what this comment refers to
10438	82	43	82	43	and droughts and pathogens are also important to consider, ssee Seidl et al. 2017 Seidl R, D Thom, M K, D Martin-Benito, M Peltoniemi, G Vacchiano, J Wild, D Ascoli, M Petr, J Honkaniemi, MJ Lexer, V Trotsiuk, P Mairota, M Svoboda, M Fabrika, TA Nagel, CPO Reyer (2017) Forest disturbances under climate change. Nature Climate Change 7:395–402 DOI 10.1038/nclimate3303 [Christopher Reyer, Germany]	Accepted - Reference was added
12084	82	43	83	16	Section needs to consider more widely the direct effects of climate change on forest productivity and growth rates. [United Kingdom (of Great Britain and Northern Ireland)]	Both direct and indirect effects are considered in an equivalent way.
35328	82	43	83	44	[...], may potentially lead to forest dieback. Still, this is highly uncertain (particularly for insects) as most studies are based on very simplistic calculations. As in my comment to p.79, I believe it is worth to add "highly uncertain" to the sentence. [Ana Bastos, France]	In AR5, it is mentioned as "medium confidence". This has been added.
2236	82	44	82	44	In terms of forest dieback, Allen et al. (2010) is a high-citation paper. Reference: Allen CD, Macalady AK, Chenchouni H, Bachelet D, McDowell N, Vennetier M, Kitzberger T, Rigling A, Breshers DD, Hogg EHT, Gonzalez P, Fensham R, Zhang Z, Castro J, Demidova N, Lim J-H, Allard G, Running SW, Semerci A, Cobb N (2010) A global overview of drought and heat-induced tree mortality reveals emerging climate change risks for forests. Forest Ecolgy and Management 259: 660-684. DOI: 10.1016/j.foreco.2009.09.001 [Akihiko Ito, Japan]	This reference is included by way of the AR5 chapter of Settele et al 2014
28350	82	44	82	46	This sentence is a copy from page 81, line 21- page 82, line 1. Please delete at one point. [Germany]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62546	82	44	82	44	Please widen the space between "outbreaks" and "(Settele et al., 2014)," [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
16228	82	45			Repeated sentence from 3.4.3.4 [Australia]	Accepted- Duplicate removed
22026	82	45		46	In the way it is written, it seems that a warming of 1.5ºC is fine for wildfire risk [LUIS VALDES, Spain]	The statement points out that warming of 1.5°C is less problematic than 2°C warming
45034	82	45	82	46	(2030-2040, which may be considered a proxy for 1.5ºC) --> Is the location of ')' OK? [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
16230	82	48	82	49	Define "climatic threshold". [Australia]	replaced by "climatic limits":
62548	82	49	82	49	Please widen the space between "CO2." and "(Good et al., 2011).," [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
16238	83		83		Technical Appendix. For the reference to Guo et al 2016, please provide quantitaive details. It is recorded that, for Brisbane, Australia, for 1.5C, net mortality for hot days and cold days reduces by 98 years of life lost compared with the baseline. Please provide details or other Australian cities [Australia]	Not applicable - This text was deleted
22028	83	1		49	Please review the entire page and correct spaces between words [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
17494	83	3	83	8	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This text was deleted
46738	83	5	83	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Noted
44470	83	7	83	7	2017)showed that under [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62550	83	7	83	7	Please widen the space between "2017)" and "showed" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 44470
16234	83	10	83	16	What of temperate forest systems? [Australia]	This is included with the reference to Reyer et al (2017)
29542	83	10	83	16	Instead of using "may" (4 times), the text would benefit of more precise description of level of confidence/agreement. [Finland]	Not applicable - This text was deleted
46740	83	10	83	10	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - This text was deleted
53128	83	10	83	16	Terrestrial plants uptake CO2 from the atmosphere through photosynthesis and losses water vapour from leaves through transpiration. They occur as a parallel process. The ratio of water CO2 assimilation to water loss is called water-use efficiency (WUE). It is a key characteristic of ecosystem function that is a key factor in global water, energy and carbon cycle. It is an important parameter for understanding the metabolism of terrestrial ecosystems. Carbon and water fluxes of leaves are related to those of larger scale ecosystems, but fluxes at ecosystem scales are weakly constrained (Keenan et al., 2013). The question of how much water a plant uses relative to carbon gained has been examined in different fields ranging from plant physiology to applied scientific disciplines such as irrigation science and agronomy (Kuglitsch et al., 2008). Given ongoing climatic change and ecosystem degradation, a deeper understanding of whole ecosystem WUE will improve our ability to simulate and predict carbon and water cycles and to refine water management (Chapin et al., 2010; Ito et. 2012). WUE has been identified as an effective integral trait for assessing ecosystem response to climate change (Baldocchi, 1994; Bacon, 2004; Hu et al., 2008; Kuglitsch et al., 2008; Beer et al., 2009). WUE is also an important factor to simulate primary productivity in models (Roupsard et al., 2009). [Thian Gan, Canada]	This is not the place for such basic ecophysiological science.
618	83	14	83	16	Thawing of organic matter will not only stimulate vegetation productivity, but also biological activities and the decomposition of plant inputs. Warming and higher moisture accelerates microbial and soil fauna activities including grazing (see Briones et al. 2014 Global Change Biology (2014) 20, 2971–2982, doi: 10.1111/gcb.12585). [Maria Jesus Iglesias Briones, Spain]	Not applicable - This text was deleted
17710	83	14	83	16	Please deal with the following: Thawing permafrost with temperature increase may stimulate decay of organic materials which could increase of emission of carbon dioxide or methane to the atmosphere. [Republic of Korea]	Not applicable - This text was deleted
5606	83	19	84	15	. section 3.4.3.5.3 Dryland ecosystems: Savannas, shrublands, grasslands, deserts [Sandra CASSOTTA, Denmark]	Subheadings have been removed for coherency with the rest of the report
5608	83	19	84	15	. I think that this section should be subdivided in separate sections: 1) Savannas,2) shrublands, 3) grasslands 4) deserts and the text in every section expanded a little bit. [Sandra CASSOTTA, Denmark]	Subheadings have been removed for coherency with the rest of the report
9826	83	19			Why is nothing mentioned on agricultural systems such as (temperate) grasslands and arable fields in this section? But in section 3.5.6.9 and 3.5.6.10 agricultural systems are actually mentioned, [Pieter De Frenne, Belgium]	Managed ecosystems are presented in section 3.4.6
13948	83	19	83	19	An important issue is how the vegetation will respond to changes in precipitation, and there can be a big disconnect in the resonse, because of the potential effect of co2 fertilization. This is shown in Mahowald ete al., 2016 and Swan et al., 2017, where regions which have a reduction on precipitation do not see a reduction in vegetation or vegetative productivity in the earth system models. This is shown to be especially different in the Mediterranean region in Mahowald et al., 2016 in the projections of leaf area index versus the projections of precipitation (figure 5 in Mahowald et al., 2016). It's unclear what this means. do we trust the ESMs' projection of LAI? Mahowald, N., Lo, F., Zheng, Y., Harrison, L., Funk, C., Lombardozzi, D., … Goodale, C. (2016). Projections of leaf area index in earth system models. Earth System Dynamics, 7(1), 211–229. https://doi.org/10.5194/esd-7-211-2016. Swann, A. L. S., Hoffman, F. M., Koven, C. D., & Randerson, J. T. (2016). Plant responses to increasing CO 2 reduce estimates of climate impacts on drought severity. Proceedings of the National Academy of Sciences, 113(36), 10019–10024. https://doi.org/10.1073/pnas.1604581113 [Natalie MAHOWALD, United States of America]	The fertilization effect is mentioned in the conclusion of the section 3.4.3 (end of page 65)
35162	83	19	83	19	Following relevant study is to be cited under the section: Grass lands are important ecosystem as the provide a number of services.While analysing the impact of Climate change on services being provided by Rangeland ecosystem Boone et al. (2017) concluded that in 2050 under RCP 8.5 scenario mean global annual net primary production (NPP) may decrease by 10 g C m?2 year?1, while herbaceous NPP is projected to increase with an average of 3 g C m?2 year?1 . These changes vary from place to place e.g. Large increase is expected in annual productivity in northern regions. In Canada and US productivity may increase by 21%, while western Africa may face serious declines i.e. nearly 46% in sub-Saharan western Africa and Australia's productivity may decrease by 17%. Moreover Soil organic carbon is expected to increase in central Asia (16%) , Australia (9%) and the Middle East (14%), and decline in many African savannahs i.e. nearly 18% in Sub-Saharan Western Africa. Similarly 7.5 to 9.6% decline in Livestock is expected with a serious economic loss of $9.7 to $12.6 billion Citation: Boone, R. B., Conant, R. T., Sircely, J., Thornton, P. K., & Herrero, M. (2017). Climate change impacts on selected global rangeland ecosystem services. Global change biology. [Shaukat Ali, Pakistan]	RCP8.5 scenario has a much larger warming the what is discussed here (1.5 to 2°C)
17496	83	20	83	21	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This section was rewritten
28352	83	20	83	23	Please ensure alignment in the use of terminology: Check, whether the terms 'grasslands' and 'rangelands' used in this para are being used interchangeably. In case both terms are to be used, then include the definitions for both to facilitate comprehensiveness. [Germany]	Accepted- The term "rangeland" is no longer used

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1434	83	26		40	This is unclear. What's the tipping point about? (I believe there was a box and I did not get it there either.) The fact that temperature increase beyond 1.5°C will lead to a state that has not existed prior to the Holocene does not necessarily qualify. A tipping point changes the trajectory of the entire (sub)system in ways that make it impossible to return to the previous state if conditions changed again. This needs to be clarified. [Karen Olsen, Denmark]	Accepted- Instead of tipping point, we speak about threshold between 1.5 and 2°C.
6250	83	26		40	This is unclear. What's the tipping point about? (I believe there was a box and I did not get it there either.) The fact that temperature increase beyond 1.5°C will lead to a state that has not existed prior to the Holocene does not necessarily qualify. A tipping point changes the trajectory of the entire (sub)system in ways that make it impossible to return to the previous state if conditions changed again. This needs to be clarified. [Anne Olhoff, Denmark]	Accepted- Instead of tipping point, we speak about threshold between 1.5 and 2°C.
16236	83	26	83	47	This section seems incomplete. It deals almost exclusievly with Mediterranean and Asian systems. What of the extensive N American and Australian shrublands, shrub encroachment etc ? [Australia]	Accepted - Text was revised with the suggested edit
17498	83	26	83	27	Observed shifts have "been observed". Well, yes. [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
18346	83	26		40	This is somewhat unclear. The fact that temperature increase beyond 1.5°C will lead to a state that has not existed prior to the Holocene does not necessarily qualify. A tipping point changes the trajectory of the entire (sub)system in ways that make it impossible to return to the previous state if conditions changed again. This needs to be clarified. [Andrea TILCHE, Belgium]	Accepted- Instead of tipping point, we speak about threshold between 1.5 and 2°C.
28354	83	26	83	27	Please include references for this observation. [Germany]	Accepted. It is added: Settele et al 2014
28356	83	26	84	15	Section 3.4.3.5.3 ends rather abruptly. It would be extremely useful to expand on what the outcomes of the examination with Stipa species and the Fynbos biome would mean for ecosystems, biodiversity and landuse in the light of climate change? It would also be helpful to include examples from other dryland regions other than inner Mongolia and South Africa. [Germany]	Not applicable - This text was deleted
45614	83	26	83	40	Considering that the whole paragraph refers to Mediterranean situation, except for the second sentence "In semi-arid biomes of the SW USA, recent drought conditions had a strong negative impact on fire incidence and intensity and vegetation productivity (Barnes et al., 2016)." I would move this sentence out of this paragrap. [Adela M Sánchez-Moreiras, Spain]	Accepted - Text was revised with the suggested edit
6730	83	27	83	27	temperatureshave' should be 'temperatures have' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10822	83	27	83	27	Change to 'and temperatures have increased….' [Franklin Paredes, Brazil]	See response to comment # 6730
17500	83	27	83	29	This sentece needs editing for grammar [David Schoeman, Australia]	Accepted - Grammar was corrected
45036	83	27	83	27	temperatureshave-->temperatures have [Hiroaki Kondo, Japan]	See response to comment # 6730
138	83	29	83	29	.Recent t.b.c. ". Recent" [teodoro georgiadis, Italy]	Accepted - Text was revised with the suggested edit
44472	83	29	83	29	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
62552	83	29	83	29	Please widen the space between "productivity" and "(Barnes et al., 2016)" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
62554	83	29	83	29	Please widen the space between "(Barnes et al., 2016)." and "Recent" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 62552
28358	83	30	83	30	Please delete the term "now". The sentence should read: "… independent complementary approaches show that …" [Germany]	Rejected
28360	83	32	83	32	What is the term "former" actually referring to? If the term is referring to a large ensemble of climate model projections, then the sentence may have to be written in plural: "… the former identify that at 1.5°C..." Please consider re-writing the sentence to avoid different interpretations/misunderstandings. [Germany]	Accepted- "Former" has been replaced with "the latter"
57100	83	33	83	33	Missed a half bracket here. [Xiaolin Zhang, China]	Not applicable - This text was deleted
28362	83	37	83	38	Please include references for the statement that "Global warming of 4°C is projected to transform Southern Spain into a desert." [Germany]	Not applicable- Statement removed to focus on 2°C
55312	83	39	83	39	fir? [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
2238	83	42	83	47	This paragraph on Song et al. (2016)'s study is too specific and can be removed. [Akihiko Ito, Japan]	Accepted - Text was revised with the suggested edit
10442	83	42	83	47	This reads like a very specific example for one species in one region but it doesn't seemto be specific to 1.5°C at all? [Christopher Reyer, Germany]	Not applicable - This text was deleted
17506	83	42	84	15	This is quite "bitty". It needs condensing and synthesis. [David Schoeman, Australia]	Not applicable - This section was rewritten
32308	83	42			Do you mean short-term exposure? Suggest deleting "relative long-term" and just stating "42 days exposure to…" [Aaron Glenn, Canada]	This part has been removed
60440	83	42	84	4	If this is not specific to 1.5 or 2°C scenarios, it should be removed. [United States of America]	Not applicable - This text was deleted
22030	83	44			remove the symbol + preceding 4ºC in the bracket [LUIS VALDES, Spain]	Not applicable - This section was rewritten
17502	83	45	83	45	Vcmax is undefined [David Schoeman, Australia]	See response to comment # 41608
35330	83	45	83	45	Add in brackets a short layman definition of Vcmax? [Ana Bastos, France]	See response to comment # 41608
41608	83	45			Add explanation of "Vcmax" [Czech Republic]	Not applicable - This text was deleted
45038	83	45	83	45	Vcmax --> Maximum rate of carboxylation? [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
62556	83	45	83	45	Please widen the space between "(+4°C)" and "caused" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 22030
3732	83	46			Use italics for Stipa bicalensis [Castor Muñoz Sobrino, Spain]	Not applicable - This text was deleted
32310	83	46			Italicize Stipa baicalensis [Aaron Glenn, Canada]	See response to comment # 3732
41610	83	46			Use italics for latin name of "Stipa baicalensis", see line 42. [Czech Republic]	See response to comment # 3732
45040	83	46	83	46	Stipa baicalensis --> Stipa baicalensis [Hiroaki Kondo, Japan]	See response to comment # 3732
45616	83	46	83	46	Stipa baicalensis should be in italic format [Adela M Sánchez-Moreiras, Spain]	See response to comment # 3732
22032	83	47			Species names must be written in italics "Stipa baicalensis" or underlined "Stipa baicalensis" [LUIS VALDES, Spain]	See response to comment # 3732
620	83	49	84	4	I found this example to be too specific for this kind of report and instead, more information is needed about soil biology. [Maria Jesus Iglesias Briones, Spain]	Not applicable - This text was deleted
2240	83	49	84	4	This paragraph on Lü et al. (2016)'s study is too specific and can be removed. [Akihiko Ito, Japan]	Not applicable - This text was deleted
5610	83	49	83	49	Lü et al. (2016)pointed should be : Lü et al. (2016) pointed [Sandra CASSOTTA, Denmark]	Not applicable - This text was deleted
62558	83	49	83	49	Please widen the space between "(2016)" and "pointed" [JACQUES-ANDRE NDIONE, Senegal]	See response to comment # 5610

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35432	84	5			In Algeria, a long-term monitoring (since 1975) in the high steppe plains, has shown that Stipa tenacissima, a structural species of these ecosystems, has lost more than 80% of its recovery following long periods of drought during the 1980s. Effectively, the inter annual variation of biomass and phenology of this specie are highly correlated with the rainfall variation, (Slimani & al 2010 ; Hirche & al 2011) [Dalila NEDJRAOUI, Algeria]	The report focuses on more recent literature
17504	84	6	84	10	Is there a link with climate? [David Schoeman, Australia]	Not applicable - This text was deleted
57122	84	15	84	15	with respect to instead of "with respect top"? [Xiaolin Zhang, China]	Not applicable - This text was deleted
622	84	18	84	38	This section is poorly written. Several key aspects need to be mentioned here: lowered water tables due to warming, long drought periods, and/or peat drainage will seriously compromise the C sink function of these ecosystems. Several studies (including my own) shown how fragile these ecosystems are. The acidic and waterlogging conditions only allows well adapted species to thrive and among them certain invertebrates (small oligochaetes) are keystone groups delivering the ecosystem functions and for these reason, they represent "early warnings or biological indicators" of climate change (Briones et al. 2007. Global Change Biology 13, 2252–2269, doi: 10.1111/j.1365-2486.2007.01434.x). Under warmer temperatures and lower soil moisture conditions they are forced to move down through the soil profile where they can access to "older" C sources and mobilise the recalcitrant organic deposits (Briones et al. 2010. Soil Biology & Biochemistry 42 (2010) 960-967). Therefore, previously "locked" C pools could be now accessed and be prone to decomposition. [Maria Jesus Iglesias Briones, Spain]	This section is reduced here because water resource and hydrology are dealt with in section 3.4.2
9618	84	18	84	38	Section 3.4.3.5.4, "Wetlands and freshwater ecosystems," is a good start, but its scope seems oddly narrow. Try to bring in a few more short examples of how climate change may impact freshwater ecosystems. For instance, one of the richest and most climate-sensitive ecosystems in the world is the freshwater ecosystem linking mountain glaciers, rivers, and the coastal ocean in the northerneastern Pacific - see (and cite) the recent review article by O'Neel et al. (2015, Bioscience, 65: 499-512). [Sean Fleming, United States of America]	This paper seems more related to hydrology (section 3.4.2)
34082	84	18	84	38	Wetlands and freshwater ecosystems is a wide-ranging term, with large variations between ecosystems and regions. Please consider splitting this section into "wetlands" and "freshwater ecosystems" and discuss them separately. [Norway]	We do not want to be exhaustive but show a few examples of impacts on these ecosystems; hydrology and coastal waters are also dealt with in other sections
34084	84	18	84	38	Please consider to include more information on the current state and greater trends for wetlands and their role in the climate system, with important effects on the natural processes. Please also consider including more information on wetlands in the boreal zone as these constitute a large part of the global wetland areas, and are at great risks due to thawing permafrost. [Norway]	Accepted. Reference is made to literature on expected loss of permafrost and role of CH4 vs CO2 emissions over long timescales after permafrost thawing.
50664	84	18	84	38	3.4.3.5.4 Wetlands and freshwater ecosystems should cite the risks from interaction of small hydro-power, river diversion and inter-basin transfers with climate change" [Jagdish KRISHNASWAMY, India]	This is not the point of this natural ecosystem section
58576	84	18	84	18	Temperate peatlands are also an important store of terrestrial C. Furthermore, drying of peatlands may cause reductions of CH4 emissions in addition to increases in CO2 emissions so the picture is complicated. Anna M. Laine, Kenneth A. Byrne, Gerard Kiely, Eeva-Stiina Tuittila (2009). The short-term effect of altered water level on carbon dioxide and methane fluxes in a blanket bog Suoseura 60: 65-83 [Paul Leahy, Ireland]	This citation is included in AR5 so there is no need to add it here
60442	84	19	84	29	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	The first paragraph dealt with the present situation and the second one on the 1.5/2°C scenarios, as in the whole section
46028	84	21	84	22	The Congo and the Amazon basin are of lower importance. Tropical peat stores about 120 Pg carbon of which 57% is located in the SE Asia (Green, S.M., Page, S., 2017. Geology Today, 33, 174-179). Furthermore, coastal peat degradation strongly favors the vulnerability to sea level rise, which strongly effects Indonesia (Rixen, T., Baum, A., Wit, F., Samiaji, J., 2016. Frontiers in Earth Science, 4.). Coastal peat lands cover 10% of the Indonesian land mass. The vulnerability of Indonesia to rising sea level isalos highlighted on page 103 line 14/15 and 19 - 23. [Tim Rixen, Germany]	Accepted. Text has been revised.
49202	84	25	84	27	Could something be added about the causes of wetland salinization? [Bill Hare, Germany]	This is done in section 3.4.5
57810	84	26	84	26	at a high rate instead of "at an high rate"? [Xiaolin Zhang, China]	Editorial - copyedit to be completed prior to publication
17508	84	28	84	28	Here, and throughout, check and correct baseling of exponents in units [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
45042	84	28	84	28	-1.15 mm yr-1 --> -1.15 mm yr-1 [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
17510	84	31	84	38	This is the first instance that I have noticed where local warming is contextualised within global warming. Throughout the chapter, care will be needed to distinguish between local changes of 1.5 or 2ºC, and global changes of 1.5 or 2ºC (where local change might be greater or less than this). [David Schoeman, Australia]	In fact what we do is to consider local and regional change under 1.5 /2°C global warming; it is clear that this may mean warmed local conditions
60444	84	34	84	35	projected to decline beyond. This clause is vague. It suggests there will be no loss of wetland function until 2-3°C local warming. Is this true? [United States of America]	Yes it is true
1436	84	35		39	Unclear logic [Karen Olsen, Denmark]	The idea behind this section is to establish a connection between global 1.5°C and local temperature.
6252	84	35		39	Unclear logic [Anne Olhoff, Denmark]	The idea behind this section is to establish a connection between global 1.5°C and local temperature.
18348	84	35		39	Unclear logic; some carity will be helpful. [Andrea TILCHE, Belgium]	The idea behind this section is to establish a connection between global 1.5°C and local temperature.
32312	84	37	84	38	Capitalize Praire Pothole to be consistent with line 33 [Aaron Glenn, Canada]	Accepted - Text was revised with the suggested edit
54706	85				Table 3.2 summary figures shouldbe included instead of the empty table [Qudsia Zafar, Pakistan]	Not applicable- This table was deleted
624	85	1	85	2	This table (like the rest included in this section) is empty. [Maria Jesus Iglesias Briones, Spain]	Not applicable- This table was deleted
31058	85	6	85	8	more than one reference is needed to justify this big statement. And is this "projected" or "expected" -i.e. did the study formally conduct projections which showed increasing inequality? [James FORD, Canada]	Not applicable - Text has been revised.
29738	86		86		The role of the ocean in climate regulation is implied but not explicit enough, the ocean is here presented as enduring climate change but not as a driving force of the system and a mitigation solution. [Capucine Pagniez, France]	Accepted: have inserted were 'driving' in revised and shortened text.
29740	86		97		A specific point on the state of biodiversity and projections with a warming of 1.5 °C and 2°C are missing. Biodiversity is mentioned in 3.4.4 but probably not enough. Perhaps is it because marine biodiversity data cannot always be related to climate change (but rather to pollution, invasive species, etc.)? [Capucine Pagniez, France]	We have dealt with biodiversity in a number of different places. E.g. The impact of losing ecosystems such as coral reefs on biodiversity, as well as shifts in the range distribution of organisms that is occurring within the ocean (as on land)

Comment No	From Page	From Line	To Page	To Line	Comment	Response
29742	86		97		The different parts on ocean lack concrete examples and explanatory diagrams. A more interactive approach would provide a better understanding of the topics covered and would help disseminate the report. [Capucine Pagniez, France]	We have added graphics (Fig 3.17, burning embers) to assist the reader in understanding risks, impacts and potential agitation options (in the broadest sense).
29746	86		97		A very important synthesis on the deep-sea environment was published recently but is not addressed or mentioned in the report. Is the deep-sea topic kept for the Ocean & Cryosphere Special Report? (Comment by Françoise Gaill) [Capucine Pagniez, France]	We can't be completely comprehensive and hence are expecting greater detail to be pursued as part of the ocean and cryosphere special report.
8100	86	1	86	1	I think this should be "ocean system" (ocean in singular, like in the previous version) [Ismael Nunez-Riboni, Germany]	We have chosen to continue with 'ocean systems' given that this section covers both natural and human systems.
22034	86	1			This part is weaker than the previous ones as it does not present data or model results on ocean/marine ecosystems responses to 1.5-2ºC scenarios. Therefore, most of the narrative is too broad and many times not going to the point. [LUIS VALDES, Spain]	Rejected: we have included exploration of papers such as Burrows and Poloczanska who have recorded the movement of species ranges and have modelled them accordingly. Equally, the narrative on coral reefs is based on observations and modelling (e.g. Freiler, Donner and Hooidonk). There are many other examples which are discussed in the section. We point out, however, that we have taken this impression on board and have provided a much more evidence-based and to the point narrative.
60446	86	1	111	38	The subsections under "ocean systems" are extremely weak in their explanation of the observed and anticipated changes in the 'physical' ocean system. The text focuses almost entirely on the anticpated ecological changes. Even the section on "ocean circulation" is focused on biological and ecological systems. Since the human systems are most connected to the ocean biological systems, the emphasis on biology is understandable. But these biological changes are, in large part, driven by changes in the physical ocean system. Without a clear exploration of the observed and anticipated changes in the physical system, the discussion of how and why the biological systems change is weak. [United States of America]	There are many pages of treatment of ocean systems in 3.3 as well as in 3.5. Due to space, it has not been possible to develop more in terms of physical changes in the ocean. Also, this will be a large part of the special report on oceans and cryosphere.
16240	86	3			Define "global temperature"- land, sea, surface, mean? [Australia]	Accepted - have replaced with 'Increases in sea temperature' in order to be more specific.
60448	86	3	86	36	Majority of this section is not specific to 1.5°C and the portion that is simply points to the fact that there have not been 1.5-specific scenarios (although some scenarios bracket 1.5°C). With that, it also offers no 1.5-specific conclusions. This section does not provide value within the scope of the report at this time and could be removed to reduce overall length. [United States of America]	Accepted: have shortened section and have removed material that is not related to 1.5°C or 2°C. Text in section on 'ocean systems' (3.4.4) is now much more focused on 1.5°C/2°C.
62560	86	4	86	4	Instead of wrting "home", "habitat" is most appropiate [JACQUES-ANDRE NDIONE, Senegal]	Accepted
22036	86	5			Add commas after "et al." (twice in this line) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
44474	86	10	86	15	Spacing issue in 2 places [Rita Man Sze Yu, China]	Not applicable - This text was deleted
50306	86	12	86	14	This is a strong statement, and a reference would be needed - or it cannot remain. Note that there is a special report on ocean and cryosphere as part of IPCC coming soon - there must be much to be assessed though. Although it is stated that much of the deep oceans are unknown, our knowledge of the oceans and its fundamental role in the Earth's climate system under climate change pressure - and its role as Earth system and climate regulator is very well advanced. [Karina VON SCHUCKMANN, France]	Accepted and removed.
8102	86	13	86	14	ecosystems have, and are, responding is a slopy shortcut, correct should be something like "ecosystems have reponded and are responding". [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
29704	86	14	86	16	Add references of papers that have addressed specifically these issues: Mora et al. 2012, Levin and Lebris 2015, Sweetman et al. 2017. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted: have replaced text that is more up-to-date - and have included some of the suggested references
37160	86	14	86	16	Add references of papers that have addressed specifically these issues: Mora et al. 2012,Plos One, Levin and Lebris 2015 in Science, Sweetman et al. 2017. (Sweetman, AK et al 2017 Major impacts of climate change on deep-sea benthic ecosystems. Elem Sci Anth, X(X): XX,DOI: https://doi.org/10.1525/elementa.203) [Françoise Gaill, France]	Accepted: have replaced text that is more up-to-date - and have included some of the suggested references
5296	86	15	86	15	change to 'include some' [Brendon Dunphy, New Zealand]	Not applicable - This text was deleted
6732	86	15	86	15	includesome' should be 'include some' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
8104	86	15	86	15	includesome -> insert a space "include some" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
10824	86	15	86	15	Change to 'our planet yet may include some of the…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
13878	86	15	86	15	include some. Please check the rest of the chapter, where there are some typos/word combined [Raden Dwi SUSANTO, United States of America]	Not applicable - This text was deleted
45044	86	15	86	15	includesome --> include some [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
626	86	16	86	19	I would like a similar sentence referring to terrestrial ecosystems in the previous section since that everything stated here also applies to terrestrial ecosystems. [Maria Jesus Iglesias Briones, Spain]	Text removed as part of requested shortening of chapter
1438	86	21		32	Could be deleted [Karen Olsen, Denmark]	Accepted: have shortened section and have removed material that is not related to 1.5°C or 2°C. Text in section on 'ocean systems' (3.4.4) is now much more focused on 1.5°C/2°C.
6254	86	21		32	Could be deleted [Anne Olhoff, Denmark]	Accepted: have shortened section and have removed material that is not related to 1.5°C or 2°C. Text in section on 'ocean systems' (3.4.4) is now much more focused on 1.5°C/2°C.
29706	86	21	86	22	Is there any reason for this depth limit? Model predictions expand much beyond this depth range and several papers (Bopp et al., 2013 ; Mora et al., 2012 ; Levin and Lebris, 2015 ; Sweetman et al., 2017) have also inventoried changes already in the deeper layers of the ocean and ocean floor. They show that combination of climate stressors already affects ecosystems below the surface. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted: have replaced text that is more up-to-date - and have included some of the suggested references
29708	86	21	86	22	Projection of models identifies several hotspots of biodiversity and ecosystem services will be impacted by the end of the century. A concern is on cold water corals and methane seeps associated ecosystems, and those at the periphery of expanding hypoxic zones. (Comment by Nadine Le Bris) [Antoine PEBAYLE, France]	This is introductory text and not intended to be comprehensive. Impacts are dealt with later in the chapter.
37162	86	21	86	22	Is there any reason for this depth limit? Model predictions expand much beyond this depth range and several papers (Bopp et al., 2013 ; Mora et al., 2012 ; Levin and Lebris, 2015 ; Sweetman et al., 2017) have also inventoried changes already in the deeper layers of the ocean and ocean floor. They show that combination of climate stressors already affects ecosystems below the surface. [Françoise Gaill, France]	Accepted: have replaced text that is more up-to-date - and have included some of the suggested references

Comment No	From Page	From Line	To Page	To Line	Comment	Response
37164	86	21	86	22	Projection of models identifies several hotspots of biodiversity and ecosystem services will be impacted by the end of the century. A concern is on cold water corals and methane seeps associated ecosystems, and those at the periphery of expanding hypoxic zones. [Françoise Gaill, France]	This is introductory text and not intended to be comprehensive. Impacts are dealt with later in the chapter.
39902	86	22	86	22	Replace "carbon dioxide" by "CO2" [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
8106	86	24	86	24	lost of sea ice: we should quote here Section 3.3.9, just like we do with the other aspects of the ocean system (sea level rise, storm activity, etc) in this paragraph. [Ismael Nunez-Riboni, Germany]	Accepted: We have inserted reference to the relevant sections including sea ice now.
32536	86	24	86	26	Rehprase "storm activity" to "change in storm activity" and summarize the change. [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
17512	86	28	86	32	Here and eslewhere…I'm not convinced that RCPs are strictly "scenarios". My impression was that the move to RCPs was an attempt to get away from "scenarios". Please check and take appropirate action, if any is needed. [David Schoeman, Australia]	Accepted: have adjusted use of scenarios accordingly.
9778	86	30	86	30	This statement is incorrect. While RCP2.6 pathways would meet 1.5degC in 2100, this is definitely not the case for RCP4.5 (within the likely range, see also AR5 WGI SPM E.1). RCP4.5 median warming is around 2.5 degC in 2100 with a likely range of from around 2 to 3 degC. Please revise this sentence as is sends the wrong message, i.e. RCP4.5 could even allow 1.5 degC pathways. [Alexander Nauels, Australia]	Accepted: have modified text accordingly - now: "While no specific scenario was modelled for 1.5°C, RCP2.6 is relatively close to 1.5oC by 2100."
17514	86	30	86	30	There is some inconsistency in the way that 1.5 and 2ºC of warming are conceived. They don't correspond to RCP2.6 and 4.5…at least I don't think they do. It might be worth fleshing out this approach of using these two RCPs to set boundary conditions. Much of what follows doesn't really address the distinction between 1.5 and 2ºC. [David Schoeman, Australia]	Accepted: have inserted text accordingly: "while no specific scenario was model for 1.5°C, RCP 2.6 is relatively close to 1.5°C by 2100."
1440	86	34			Why do "risk factors operate in isolation" and what is this supposed to mean? The subsequent sentence seems to be contradictory, but I cannot say for sure. [Karen Olsen, Denmark]	Accepted - 'really' was incorrect word - was meant to be 'rarely' - relating to the fact that risk factors rarely operate alone and that they often combine (synergistically or not).
6256	86	34			Why do "risk factors operate in isolation" and what is this supposed to mean? The subsequent sentence seems to be contradictory, but I cannot say for sure. [Anne Olhoff, Denmark]	Accepted - 'really' was incorrect word - was meant to be 'rarely' - relating to the fact that risk factors rarely operate alone and that they often combine (synergistically or not).
6734	86	34	86	34	factors really operate' should be 'factors rarely operate' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
12086	86	34	86	36	What does this mean? [United Kingdom (of Great Britain and Northern Ireland)]	Text changed
16242	86	34	86	34	do not operate - should add citation for this statement [Australia]	Text changed
16244	86	34	86	36	This point about other (non climate) risk factors is important, so suggest including it briefly in chapter 3 summary. [Australia]	Accepted: done so.
17516	86	34	86	34	Replace "really" with "rarely". [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
18350	86	34			Why do "risk factors operate in isolation" and what is this supposed to mean? The subsequent sentence seems to be contradictory, but this is not clear. [Andrea TILCHE, Belgium]	Accepted - 'really' was incorrect word - was meant to be 'rarely' - relating to the fact that risk factors rarely operate alone and that they often combine (synergistically or not).
28364	86	34	86	34	Importantly, risk factors really operate in isolation is this right? Or rather …RARELY operate in isolation? [Germany]	Accepted: 'Really' was incorrect, 'rarely' was the right term.
31060	86	34	86	53	really should be "rarely" [James FORD, Canada]	Accepted - Text was revised with the suggested edit
32538	86	34	86	34	Change "really" to "rarely" [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised with the suggested edit
34086	86	34	86	36	Importantly, risk factors really operate in isolation. This statement seems to contrast the message in the text that follows. Perhaps it should be "rarely" instead of "really"? [Norway]	Accepted: 'Really' was incorrect, 'rarely' was the right term.
35952	86	34	86	34	Change - 'really' to 'rarely' [India]	Accepted - Text was revised with the suggested edit
41404	86	34			Please explain the statement "risk factors operate in isolation". [Lourdes Tibig, Philippines]	Accepted - 'really' was incorrect word - was meant to be 'rarely' - relating to the fact that risk factors rarely operate alone and that they often combine (synergistically or not).
60450	86	34	86	34	really should be "rarely" [United States of America]	Accepted - Text was revised with the suggested edit
47086	86	35	86	35	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Text changed
54670	87				Change in productivity is not included in the Table, though it is considered as one of the main driver of climate change on ecosystems below the photic zone with significant impacts on seafloor biomass (e.g. Jones et al. 2014). Jones DOB, Yool A, Wei C-L, Henson SA, Ruhl HA, Watson RA, Gehlen M. 2014. Global reductions in seafloor biomass in response to climate change. Global Change Biology 20(6): 1861–1872. doi: 10.1111/gcb.12480. Palanques A, Puig P, Guillén J, Durrieu de Madron X, Latasa M, Scharek R, Martin J. 2011. Effects of storm events on the shelf-to-basin sediment transport in the southwestern end of the Gulf of Lions (Northwestern Mediterranean). Natural Hazards and Earth System Science 11(3): 843–850. doi: 10.5194/nhess-11-843-2011 [Nadine Le Bris, France]	Accepted: Table has been removed.
62566	87		87		Please widen the space between "ways" and "(Halpern et al., 2015)." [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This text was deleted
570	87	1	87	5	Sea level numbers are consistent neither with the text nor AR5. It is also worrying to see these presented as point estimates without uncertainty ranges. [Robert Koppu, United States of America]	Accepted: Table has been removed.
628	87	1	87	5	A similar table (Table 3.3) should also be drawn for terrestrial ecosystems. [Maria Jesus Iglesias Briones, Spain]	Accepted: Table has been removed.
1442	87	1		5	The table is not very insightful and could be removed. [Karen Olsen, Denmark]	Accepted: Table has been removed.
6258	87	1		5	The table is not very insightful and could be removed. [Anne Olhoff, Denmark]	Accepted: Table has been removed.
9780	87	1	87	5	This table should not provide average SLR estimates only but 66% or 90% ranges as uncertainties are key. In this context, it is important to note that the numbers provided do not account for potential additional rapid discharge from Antarctica (DeConto et al 2016). Given the implications for the uncerainty range, estimates should be used that include the corresponding processes, e.g. Kopp et al. 2017 EF. The table should also focus on strong mitigation pathways, RCP8.5 coul be referred to in the text. [Alexander Nauels, Australia]	Accepted: Table has been removed.
16246	87	1	87	5	This table should be reframed in terms of the 1.5C versus 2.0 C warming scenarios. RCP 8.5 is not relevant here. [Australia]	Accepted: Table has been removed.
17712	87	1	87	5	This table presents similar prediction values for the various factors in two forms. However, for readability it is reasonable to show it in one table form. [Republic of Korea]	Accepted: Table has been removed.
18352	87	1		5	The table is not very insightful and could be removed. [Andrea TILCHE, Belgium]	Accepted: Table has been removed.
34088	87	1	87	2	Table 3.3 caption: Please check if some words are lacking here: "…ocean volume with respect to aragonite". [Norway]	Accepted: Table has been removed.

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54666	87	1	87	1	Changes in SST, pH, oxygen content, sea level and ocean volume with respect to aragonite in CMIP5 models and RCP emission scenarios. It is unclear here of oxygen content and aragonite are reported for the surface like temperature, or if the values are global ocean averages. Bopp et al. 2013 provide differentiated estimates for mode and intermediate, and deep waters. It might be useful here to introduce these differences as the impacts are different but significant and risks are specific but also significant in terms of retroaction on climate (C-sequestration) and ecosystem services (both to human and biodiversity). [Nadine Le Bris, France]	Accepted: Table has been removed.
57636	87	1	87	5	Here the chapter has moved into impacts on natural and human systems – shouldn't this table be in section 3.3??? [Hans Poertner, Germany]	Accepted: Table has been removed.
10826	87	2	87	2	Change to 'Originally from Bopp et al. (2013) and as presented…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
44476	87	2	87	2	Spacing issue in 2 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
62562	87	2	87	2	Please widen the space between "from." and "Bopp et al." [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
62564	87	2	87	2	Please widen the space between "(2013)" and "and" [JACQUES-ANDRE NDIONE, Senegal]	Accepted - Text was revised with the suggested edit
8108	87	3	87	3	Insert spaces before "Bopp" and after (2013). Delete parenthesis from Gattusso et al [Ismael Nunez-Riboni, Germany]	Editorial - copyedit to be completed prior to publication
302	87	4	87	4	Some of the rows in Table 3.3 (both A and B) are redundant. [Paul Doyle, Canada]	we have reduced redundancy.
49476	87	4	87	5	SLR in table inconsistent / outdated due to new literature compared with Section 3.3.10 and p91, line 37 and Figure 3.21. [Sally Brown, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: Table has been removed.
49478	87	4	87	5	SLR in table omits uncertainty which is extremely important. [Sally Brown, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: Table has been removed.
630	87	7	87	14	This paragraph is so vague that applies to every natural system. [Maria Jesus Iglesias Briones, Spain]	Accepted: text replaced with more specific version which also focuses in on 1.5°C.
34090	87	7	87	14	3.4.4.1 Observed impacts: This subsection reports somewhat vague generalities, without examples. Lines 11-14 do not report impacts at all, but rather a call for further study - this seems out of place here. Please consider to improve this subsection. There are a considerable number of studies reporting published "impacts" including conditional declines, reproductive declines, major behavioural changes etc. with reduced sea ice and also shifts in ecological relationships, such as classical Arctic predator-prey systems (polar bear/ringed seal) decoupling seasonally concomitant with declines in the seasonal availability of land-fast ice. [Norway]	Accepted: text replaced with more specific - and less vague - also sharper focus on 1.5°C.
60452	87	8	87	14	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	This section is about 'Observed impacts). This text is discussing what has happened up to 1.0oC. Important in understanding how things are likely to change over 1.5oC and 2oC.
5298	87	11	87	11	space between 'ways' and (Halpern' [Brendon Dunphy, New Zealand]	Not applicable - This text was deleted
8110	87	11	87	11	Insert space after "ways". I am affraid this issue with the spaces is a compatibility one, I remember having a similar problem between 2 different versions of MS World, where spaces were deleted randomly from one file. Perhaps there is a general solution for this? [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
22038	87	11			insert space between "ways(Halpern" [LUIS VALDES, Spain]	Not applicable - This text was deleted
44478	87	11	87	11	antagonistic ways(Halpern et al., 2015) [Rita Man Sze Yu, China]	Not applicable - This text was deleted
60454	87	16	88	32	Section 3.4.4.1.1 – entitled "Warming and stratification of the surface ocean" – does not discussion stratification. In fact, the word "stratification" only appears once, parenthetically. [United States of America]	Accepted. Sentences more tightly focused and stratification has been removed from the brackets.
34092	87	17	87	19	Please consider whether the reference to Table 1 is wrong, and should rather be Table 3.3. [Norway]	Accepted - Reference has been corrected
7600	87	18	87	18	...for RCP2.6 and RCP4.5 scenarios respectively insert comma after scenarios [Jens Zinke, Germany]	Not applicable - This text was deleted
8112	87	18	87	18	by the end of century should be "by the end of *the* century" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
8114	87	19	87	19	Are you sure you want to quote here a "Table 1"? All other tables here have 2 digits, i.e., Chapter.TableNr. [Ismael Nunez-Riboni, Germany]	Accepted - Reference has been corrected
14174	87	19	87	19	Table 1? [Rongshuo Cai, China]	Accepted - Reference has been corrected
60456	87	19	88	32	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Rejected: This section is about 'Observed Impacts'). This text is discussing what has happened up to 1.0oC. Important in understanding how things are likely to change over 1.5oC and 2oC.
34094	87	20	88	2	Please consider rephrasing "from phytoplankton to sharks" to "from phytoplankton, to fish and marine mammals". [Norway]	Accepted: text removed as part of request to shorten
5788	88				The analysis relies too heavily on results from a single research group using a single type of model (DBEM). In my view an IPCC report should seek to synthesise the fullest possible range of results, using different models and based on different assumptions. I note that the level of confidence concerning fisheries catch potential has dropped since WGII AR5 SPM stated: "Species richness and fisheries catch potential are projected to increase, on average, at mid and high latitudes (high confidence) and decrease at tropical latitudes (medium confidence). See Figure SPM.6A." whereas SR15 SOD Ch 3 says: [Keith Brander, Denmark]	Accepted: suggested changes and the inclusion of wider literature sources have been added to narrative and text.
5790	88				"Changes to global temperature are driving decreases in NPP in some regions (e.g. reduced equatorial up-welling, and increased stratification) with low to medium confidence(Boyd et al., 2014; Hoegh-Guldberg et al., 2014; Pörtner et al., 2014b; 15 Signorini et al., 2015). Similar levels of confidence can be assigned to the increased fish catch being reported at high latitude sites in the northern hemisphere where ice retreat and warming are stimulating primary productivity through greater light levels and nutrients from increased water column mixing (Cheung et al., 2016a; Poloczanska et al., 2014; Weatherdon et al., 2016)." [Keith Brander, Denmark]	Accepted: suggested changes and the inclusion of wider literature sources have been added to narrative and text.
5792	88				The three references given at the end all rely on DBEM. The cited paragraph and other parts of the document give the impression that changes in NPP are driving the changes in catch or catch potential, but the DBEM projections of catch potential are in fact more sensitive to temperature than to NPP (Cheung et al. 2016)? Fig S7). The results are therefore sensitive to the physiological model within the DBEM model, which has recently come in for criticism from physiologists (Jutfelt et al. 2018; Lefevre et al. 2017)?. [Keith Brander, Denmark]	Accepted: suggested changes and the inclusion of wider literature sources have been added to narrative and text.
5794	88				In my view there are better published projections of potential fisheries yields (e.g. (Barange et al. 2014)?) that are not even referred to in this report, but should be. The overall conclusions would probably not be changed substantially, although there are major regional difference from DBEM results. Including results from other research groups would give a better view of the diversity of approaches (e.g. shelf seas models as well as GCMs, different biological models) and assumptions and temper the confidence statements, which were misleadingly high in AR5. [Keith Brander, Denmark]	Accepted: suggested changes and the inclusion of wider literature sources have been added to narrative and text.

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5796	88				Barange, M. et al., 2014. Impacts of climate change on marine ecosystem production in societies dependent on fisheries. Nature Climate Change, 4(3), pp.211–216. Available at: http://www.nature.com/doifinder/10.1038/nclimate2119 [Accessed October 19, 2014]. Cheung, W.W.L., Reygondeau, G. & Frölicher, T.L., 2016. Large benefits to marine fisheries of meeting the 1.5°C global warming target. Science, 354(6319), p.1591 LP-1594. Available at: http://science.sciencemag.org/content/354/6319/1591.abstract. Jutfelt, F. et al., 2018. Oxygen- and capacity-limited thermal tolerance: blurring ecology and physiology. The Journal of Experimental Biology, 221(1). Available at: http://jeb.biologists.org/content/221/1/jeb169615.abstract. Lefevre, S., McKenzie, D.J. & Nilsson, G.E., 2017. Models projecting the fate of fish populations under climate change need to be based on valid physiological mechanisms. Global Change Biology, p.n/a-n/a. Available at: http://dx.doi.org/10.1111/gcb.13652. [Keith Brander, Denmark]	Accepted: suggested changes and the inclusion of wider literature sources have been added to narrative and text.
16256	88		88		Climate-related disease outbreaks have already affected coral reefs globally and are projected to increase in frequency and severity as ocean warming continues. Reference: Maynard et al., Nature Climate Change. 5, 688–694 (2015). [Australia]	Accepted: text changed to accommodate issue that disease may be increasing.
22040	88	1		49	Please correct spaces between words (e.g. lines 3, 14, 25, 44) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
44480	88	2	88	44	Spacing issue in 5 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
60458	88	2	88	2	Biogeographical shifts of 40 km/year are at the extreme end of shift rates, as somewhat suggested in the text. Providing a range of shift rates will be more meaningful. [United States of America]	Accepted - range added.
8116	88	3	88	3	Again, a space should be insterted before "(Poloczanska" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
62568	88	3	88	3	Please widen the space between "livelihoods." and "(Poloczanska et al., 2016)." [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
34096	88	4	88	7	Will marine biodiversity increase in higher latitudes? In the Arctic we see a change in the artic marine biodiversity. We see a reduction in high-arctic species. Please consider rephrase to: .." while an increasing number of southern species are shifting their ranges northwards". [Norway]	Accepted: text modified
17518	88	5	88	5	Either "enhanced" or "elevated", but not both [David Schoeman, Australia]	Not applicable - This text was deleted
8118	88	6	88	6	Why are we not quoting "Cheung et al., 2009" (Cheung, W. W. L., Lam, V. W. Y., Sarmiento, J. L., Kearney, K., Watson, R., Pauly, D., 2009. Projecting global marine biodiversity impacts under climate change scenarios. Fish and Fisheries 10 235–251.) here, who also showed (earlier than all other studies quoted), that equatorial regions are projected to experience local extinctions and higher latitudes increase in biodiversity? Because they did not use the RCP scenarios for their projection? [Ismael Nunez-Riboni, Germany]	Accepted: Text modified and reference added
46030	88	11	88	11	would be better to say: by nutrient inputs from subsurface waters by upwelling and convective mixing [Tim Rixen, Germany]	Accepted: but text removed due to required cuts to length of text.
17714	88	12	88	14	The change in NPP is considered to be a very important factor not onle global temperature change but also in light penetration. Therefore, it is necessary to mention the change of light penetration with global temperature in this sentence. [Republic of Korea]	Accepted: but text removed due to required cuts to length of text.
8120	88	13	88	13	Delete a comma after up-welling [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
8122	88	14	88	14	Insert a space before "(Boyd" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
62570	88	14	88	14	Please widen the space between "confidence" and "(Boyd et al., 2014" [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
6108	88	15	88	15	After "Signorini et al., 2015)" add this ", mainly in tropical regions (Chust et al 2014b)". Reference is Chust, G., J. I. Allen, L. Bopp, C. Schrum, J. Holt, K. Tsiaras, M. Zavatarelli, M. Chifflet, H. Cannaby, I. Dadou, U. Daewel, S. L. Wakelin, E. Machu, D. Pushpadas, M. Butenschon, Y. Artioli, G. Petihakis, C. Smith, V. Garçon, K. Goubanova, B. Le Vu, B. A. Fach, B. Salihoglu, E. Clementi, and X. Irigoien. 2014. Biomass changes and trophic amplification of plankton in a warmer ocean. Global Change Biology 20:2124-2139. [Guillem Chust, Spain]	Accepted
205	88	20	88	32	The whole paragraph is fragmented and most of the sentences do not connect to each other, nor having a connecting rationale. This parag. needs rewriting [Baruch RINKEVICH, Israel]	Accepted: we have rewritten and shortened the section as requested. This text is no longer in a form that is confusing.
632	88	20	88	25	This is another example of the unbalance focus on marine organisms. As I stated earlier, soil organisms (like corals) have little chances to respond to warming due to their low dispersal abilities. [Maria Jesus Iglesias Briones, Spain]	This section focuses on ocean systems and not terrestrial systems. Hence, other sections deal with non-marine topics.
203	88	20	88	25	There are major exceptions to the statement in these lines, since coral reefs may rapidly move upnorth in the north hemisphere, expanding their geographical distributions. Examples: Chen, I. C., Hill, J. K., Ohlemüller, R., Roy, D. B., Thomas, C. D. (2011). Rapid range shifts of species associated with high levels of climate warming. Science, 333(6045), 1024-1026.? Yamano, H., Sugihara, K., Nomura, K. (2011). Rapid poleward range expansion of tropical reef corals in response to rising sea surface temperatures. Geophysical Research Letters, 38(4).? Woodroffe, C. D., Brooke, B. P., Linklater, M., Kennedy, D. M., Jones, B. G., Buchanan, C., et al.(2010). Response of coral reefs to climate change: Expansion and demise of the southernmost Pacific coral reef. Geophysical Research Letters, 37(15).? Baird, A. H., Sommer, B., Madin, J. S. (2012). Pole-ward range expansion of Acropora spp. along the east coast of Australia. Coral Reefs, 1-1.?This has also documented in forests. An example: Hopkins, M. S., Head, J., Ash, J. E., Hewett, R. K., Graham, A. W. (1996). Evidence of a Holocene and continuing recent expansion of lowland rain forest in humid, tropical North Queensland. Journal of Biogeography, 23(6), 737-745.? Same implies to other sessile marine organisms. An Example: Dawson, M. N., Grosberg, R. K., Stuart, Y. E., Sanford, E. (2010). Population genetic analysis of a recent range expansion: mechanisms regulating the poleward range limit in the volcano barnacle Tetraclita rubescens. Molecular ecology, 19(8), 1585-1605.? [Baruch RINKEVICH, Israel]	Accepted: while there have been reports of corals moving to high latitudes, there is no evidence that complex carbonate reef systems are able to relocate significantly in the polar direction. I have included couple of references on the issue of range expansion of coral species.
16248	88	20	88	32	Another example of observed impacts could be marine turtles. [Australia]	Due to space restraints, we are unable to perform a comprehensive analysis of all changes. Recommend inclusion of impacts and totals as part of the special report on oceans cryosphere, and in AR6 generally.
16250	88	20	88	32	As this is under a subsection on observed impacts, suggest lanuguage and content of this paragraph is revised to make it clearer that climate change impacts (such as mass bleaching-related mortality of corals) are already occuring at geographic scales. This could also be the place for a strong sentence saying reefs are not 'safe' at current levels of warming. [Australia]	Accepted: have included reference like this in box 3.6 on coral ecosystems.

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40308	88	20	88	31	In Egypt, a detailed survey in August and October 2012, in comparison to the baseline survey conducted in 2011, revealed that increase of water temperature affected certain reef building coral genera including; Montipora, Porites, Acropora, Stylophora and Pocilliopora and some non-reef building corals including, Millipora and some of the soft corals and sea anemone, located on the Egyptian coast of the Red Sea, starting from Neweibaa in the northern part of the Gulf of Aqaba ending with Shalatien on the Egyptian southern border. The mass bleaching event was restricted mainly to the first 6 meters of depth, and then reduced sharply in depths between 6 meters to 10 meters. Although sheltered areas were found to be more impacted by coral bleaching, the mass bleaching event affected both sheltered and exposed sites. (Reference: Third National Communication Reports of Climate Change in Egypt (2016). http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html) [Amal Hussein, Egypt]	interesting study. We are encouraged to work with peer-reviewed publications. We encourage publication in time for the AR6 assessment
11144	88	23	88	25	I propose to add information on other organisms and other geographical areas worryingly impacted by warming (mass mortalities), for example benthic communities in the Mediterranean Sea, recurrently impacted by thermal anomalies during the past decades (e.g. Garrabou et al. 2009, Kersting et al. 2013). [literature: Garrabou J, Coma R, Bensoussan N, Bally M, Chevaldonné P, Cigliano M, Díaz D, Harmelin G, Gambi MC, Kersting DK, Ledoux JB, Lejeusne C, Linares C, Marschal C, Pérez T, Ribes M, Romano JC, Serrano E, Teixidó N, Torrents O, Zabala M, Zuberer F, Cerrano C (2009) Mass mortalities in Northwestern Mediterranean rocky benthic communities: effects of the 2003 heat wave. Global Change Biology 15: 1090-1103.; Kersting DK, Bensoussan N, Linares C (2013) Long-term responses of the endemic reef-builder Cladocora caespitosa to Mediterranean warming. Plos ONE 8: e70820.] [Diego Kurt Kersting, Germany]	Accepted: have included intertidal communities and a couple of references that describe the link between mass mortality and exceptional heatwave conditions.
19280	88	24	88	24	kelp forests instead of plants [Spain]	Accepted
39980	88	24	88	25	(Hughes et al., 2017; 25 Krumhansl et al., 2016)(Babcock et al. 2018). Put in the same bracket [Adi Nugraha, United States of America]	Not applicable - This section was rewritten
204	88	25	88	25	Add a sentence with newly published outcome: Global change impacts (primarily sea water increase) may also cause the lengthening of the reproductive season, cause an extension of peaks in larval release and the increase in the percentage of colonies that release planula larvae (Shefi, D., Shashar, N., Rinkevich, B. 2018. The reproduction of the Red Sea coral Stylophora pistillata from Eilat: four decades perspective. Marine Biology 165:27). [Baruch RINKEVICH, Israel]	Thank you for the reference. Space is limited - this detailed observation needs to be weighed up against other broader papers.
5612	88	25	88	25	Krumhansl et al., 2016)(Babcock et al. 2018).....please remove the parentesis. [Sandra CASSOTTA, Denmark]	Not applicable - This section was rewritten
7602	88	25	88	25	...Krumhansl et al., 2016)(Babcock et al. 2018). comma instead of brackets [Jens Zinke, Germany]	Not applicable - This section was rewritten
8124	88	25	88	25	Replace)(with a semicolon [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
62572	88	25	88	25	Instead of writing "Krumhansl et al., 2016)(Babcock et al. 2018).", please write "Krumhansl et al., 2016; Babcock et al. 2018)." [JACQUES-ANDRE NDIONE, Senegal]	Not applicable - This section was rewritten
5300	88	28	88	28	join citations of Krumhansl et al and Babcock et al [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
46742	88	28	88	30	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - as part of required shortening, text has been deleted.
60460	88	30	88	31	This is not specific to 1.5 or 2°C scenarios and should be removed. Additionally, it makes assumptions that do not cite sufficient scientific evidence. [United States of America]	Accepted: sentence removed.
32540	88	35	89	20	Have joint coastal-watershed extreme events and/or impacts been considered? See e.g. Ikeuchi et al. 2017. " Compound simulation of fluvial flood and storm surges in a global coupled river-coast flood model: Model Development and its application to 2007 Cyclone Sidr in Bangladesh". Journal of Advances in Modeling Earth Systems, J. Adv. Model. Earth Syst., 9, 1847–1862, doi:10.1002/2017MS000943; Kew et al., 2017. "The simultaneous occurrent of surge and discharge extremes for the Rhine delta". Nat. Hazards Earth Syst. Sci., 13, 2017–2029, 2013. Wahl et al, 2015. "Increasing risk of compound flooding from storm surge and rainfall for major US cities". Nature Climate Change, Vol 5, Dec 2015. [Rosanne Martyr-Koller, Germany]	This section is focused on storms and coastal run-off. It appears that this piece of research is more aligned with the sections on sea level rise. This has been passed on to appropriate authors within the special report.
7330	88	36	89	20	For consistency and coherence, this section should take into account runoff studies referred to in section 3.3.5 [Chantal Donnelly, Australia]	Accepted
13334	88	36	89	20	Impacts related to attributes of tropical cyclones are notably flawed and the compounding effect on the hazard of sea level rise is missing [Grenada]	Accepted: have added linkages to the sea level rise section - particularly where storms are mentioned - which deals with cities, deltas, small island states et cetera.
32162	88	36	89	20	Impacts related to attributes of tropical cyclones are notably flawed and the compounding effect on the hazard of sea level rise is missing [Jamaica]	Accepted: have added linkages to the sea level rise section - particularly where storms are mentioned - which deals with cities, deltas, small island states et cetera.
36450	88	36	89	20	Impacts related to attributes of tropical cyclones are notably flawed and the compounding effect on the hazard of sea level rise is missing [Snaliah Mahal, Saint Lucia]	Accepted: have added linkages to the sea level rise section - particularly where storms are mentioned - which deals with cities, deltas, small island states et cetera.
60462	88	36	89	12	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	This section concerns observed impacts (up to 1°C of the preindustrial) - hence the relevance of reporting changes in his ocean circulation which have serious ramifications for fisheries and evolution of issues such as dead zones.
17716	88	37	88	38	In addition to the number of very intense tropical cyclones, the changes of travel route of tropical cyclones are also causing many damage in the coastal areas, so it is necessary to mention this. [Republic of Korea]	Accepted: Have added 'along with changes to storm pathways', plus reference - Cheal et al. 2017
41406	88	37	88	39	confidence level? Current assessment is that there is low confidence in the assessment of trends of tropical cyclone intensity [Lourdes Tibig, Philippines]	Accepted: confidence added.
5302	88	38	88	38	decrease [Brendon Dunphy, New Zealand]	Accepted - Text was revised with the suggested edit
6736	88	38	88	38	decease' should be 'decrease' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
19282	88	38	88	38	decrease instead of decease [Spain]	Accepted - Text was revised with the suggested edit
34098	88	39	88	41	Please include "tropical" before "coral". [Norway]	Accepted: word added

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54674	88	42	88	42	Storms and wave can have important consequence on ecosystems from the continental margins (Company et al. 2008; Palanques et al. 2011; Sanchez-Vidal et al. 2012), despite observation are still limited to a few long-term monitored areas. Through the formation of eddies, extreme meteorological event play signficant roles in the transport of nutrient, low oxygen and biological material across the water column and laterally off shore over hundreds of km (Bettencourt et al. 2009; Stramma et al. 2014). Bettencourt JH, López C, Hernández-García E, Montes I, Sudre J, Dewitte B, Paulmier A, Garçon V. 2015. Boundaries of the Peruvian oxygen minimum zone shaped by coherent mesoscale dynamics. Nature Geoscience 8(12): 937–940. doi: 10.1038/ngeo2570. Stramma L, Weller RA, Czeschel R, Bigorre S. 2014. Eddies and an extreme water mass anomaly observed in the eastern south Pacific at the Stratus mooring. Journal of Geophysical Research: Oceans 119(2): 1068–1083. doi: 10.1002/2013JC009470. Palanques A, Puig P, Guillén J, Durrieu de Madron X, Latasa M, Scharek R, Martin J. 2011. Effects of storm events on the shelf-to-basin sediment transport in the southwestern end of the Gulf of Lions (Northwestern Mediterranean). Natural Hazards and Earth System Science 11(3): 843–850. doi: 10.5194/nhess-11-843-2011. Company JB, Puig P, Sardà F, Palanques A, Latasa M, Scharek R. 2008. Climate Influence on Deep Sea Populations. Humphries S, editor. PLoS ONE 3(1): e1431. doi: 10.1371/journal.pone.0001431 [Nadine Le Bris, France]	required space limitation means we are unable to be comprehensive on all aspects of the impacts of climate change. Consequently, recommend forwarding of information to AR6 or to the special report on oceans and cryosphere (both of which have more space assigned to the details of the issues).
5304	88	44	88	44	amplified [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
6738	88	44	88	44	hasamplified' should be 'has amplified' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7604	88	44	88	44	…rise has amplified… [Jens Zinke, Germany]	Not applicable - This section was rewritten
8126	88	44	88	44	Inster space in "hasamplified" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
10828	88	44	88	44	Change to 'Sea level rise has amplified these impacts…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
45046	88	44	88	44	hasamplified --> has amplified [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
18354	88	44	88	45	The work of Mentaschi et al. (2018) is relevant here. They present a global evaluation of coastal morphodynamics over the past 32 years (1984-2015) based on satellite observations. Findings are that the overall surface of eroded land is about 28,000 km2, twice the surface of gained land, and that often erosion and accretion are in the order of kilometers. From these observations the anthropogenic factor clearly emerges as prominent, both as a planned exploitation of coastal resources, such as building coastal structures, and as an unforeseen side effect of intensive human activities, like the installment of dams, irrigation systems and structures that modify the flux of sediments, or the clearing of coastal ecosystems like mangrove forests. Another important driver is the occurrence of natural disasters like tsunamis and extreme storms. The observed global trend in coastal erosion could be enhanced by Sea Level Rise and increasing extreme events in view of climate change. The study further shows the vulnerability of SIDS, so this work is also relevant for box 3.7 on SIDS. Mentaschi, L., Vousdoukas, M., Pekel, J.F., Voukouvalas, E., Feyen, L., 2018. Global long-term shoreline evolution. Revised manuscript (minor revision) submitted to Nature Scientific Reports on January 30, 2018. [Andrea TILCHE, Belgium]	We encourage submission to the special report on oceans and cryosphere.
17520	88	45	88	45	Insert "inland" between "further" and "than" [David Schoeman, Australia]	Accepted - Text was revised with the suggested edit
16252	88	49	89	3	In discusssing the decline in hard coral cover on the Great Barrier Reef, outbreaks of Crown of Thorns Starfish should be mentioned as these were as important as tropical cyclones in causing recent coral loss (De'ath et al 2012) [Australia]	Accepted: have added linkages to the sea level rise section - particularly where storms are mentioned - which deals with cities, deltas, small island states et cetera. Note that text has been shortened so further details are not required in this instance.
16254	88	49	89	3	There are four instances of text in parentheses in this one sentence- please limit it to two at most. [Australia]	Not applicable - This section was rewritten
22042	89	1		49	Please correct spaces between words (e.g. lines 7, 29, 37, 43) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
16258	89	3	89	3	Updates being prepared in 2018 to De'ath et al. 2012 so check AIMS website for updates. [Australia]	Accepted: have added linkages to the sea level rise section - particularly where storms are mentioned - which deals with cities, deltas, small island states et cetera. Note that text has been shortened so further details are not required in this instance.
46744	89	5	89	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted
8128	89	7	89	7	Inster space in "mangroves(Burt" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
17524	89	7	89	12	This sentece needs editing for grammar and meaning [David Schoeman, Australia]	Not applicable - This text was deleted
44482	89	7	89	11	Spacing issue in 3 places [Rita Man Sze Yu, China]	Not applicable - This text was deleted
17522	89	8	89	8	Replace "incident" with "incidence". [David Schoeman, Australia]	Not applicable - This text was deleted
46746	89	10	89	10	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted
5306	89	11	89	11	waters (Brodie…. [Brendon Dunphy, New Zealand]	Not applicable - This text was deleted
8130	89	11	89	11	Inster space in "waters(Brodie" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
206	89	14	89	16	The sentence is not clear, needs rewriting and citation.What is :'reducing exposure to storms'? What are the ' long-term planning for the combined challenges of increased…'? [Baruch RINKEVICH, Israel]	The authors are referring to the fact that exposure to storms can be managed, and that these factors don't operate on their own and hence the mention of interaction between sea level, salinization and storm intensity.
6740	89	15	89	15	increased storms intensity' should be 'increased storm intensity' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
207	89	16	89	19	The whole sentence is vague. In addition: what is the 'Integrating the expected shoreward migration of key coastal ecosystems'? Also: "fisheries habitat and coastal protection" are not ecological services. [Baruch RINKEVICH, Israel]	The movement of ecosystems mean that the services that these ecosystems provide have to move as well. I think this is pretty clear.
17526	89	17	89	17	Replace "area" with "areas". [David Schoeman, Australia]	Not applicable - This text was deleted
208	89	19	89	20	This sentence is not connected to the other sentences in the paragraph. Needs revision/rewriting. [Baruch RINKEVICH, Israel]	Accepted: paragraph rewritten.
60464	89	23	90	3	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	This section is call observed impacts and as part of the plenary approved outline. Hence, impacts up to 1.0°C (today) are important
50308	89	24	89	26	better use "horizontal" and "vertical" instead of geographic or depth-related. Moreover, ocean currents play also the fundamental role for climate and weather patterns, and climate change through their huge capability to transport large amounts of heat through the climate system. Indeed, heat is mentioned in the sentences, but not linked to climate regulation. [Karina VON SCHUCKMANN, France]	Accepted: section now includes mention of heat transport. Further elaboration is difficult given required cuts to the length of the text.
5308	89	29	89	29	people (Bakun… [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
8132	89	29	89	29	Inster space in "people(Bakun" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten

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44484	89	29	89	43	Spacing issue in 4 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
46032	89	33	89	41	The data base to prove the Bakun hypothesis is still insufficient. Additionally there is the problem of an increased stratification as also mentioned by Sydeman et al., 2014 and Wang et al 2015. Futhermore I read nothing e.g. about the impact of the weakening of the AMOC and the associated warming of Benguela Current (Rahmstorf et al., 2015) on the Beguela Current Upwelling System . GCMs (Zuidema, 2011) as well and regional models still have problems to capture the small scale coastal upwelling events. The response of upwelling systems to global warming is to my understanding still an open question. your commnets on page 95 line 20 support this. [Tim Rixen, Germany]	We draw on the latest work and papers and reflect the fact that that there is moderate agreement among scientists and a modest amount of data as illustrated by Sydman's paper. We also continue to mention the state of evidence for changes to the AMOC, reflecting the fact that there is a medium agreement but limited evidence.
5310	89	35	89	35	cases (Lluch… [Brendon Dunphy, New Zealand]	Accepted - Text was revised with the suggested edit
8134	89	35	89	35	Insert space in " cases(Lluch-Cota" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
8136	89	37	89	37	Inster space in "systems,but" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
46748	89	40	89	40	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted
5312	89	43	89	43	profound impact [Brendon Dunphy, New Zealand]	Accepted - Text was revised with the suggested edit
6742	89	43	89	43	profoundimpacts' should be 'profound impacts' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7606	89	43	89	43	...have profound impacts… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8138	89	43	89	43	Insert space in "profoundimpacts" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10830	89	43	89	43	Change to 'Changes in ocean circulation can have profound impacts on marine ecosystems…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
16260	89	43	90	3	There are a few studies about changes of ocean ciruclation, such as poleward expansion of subtropical ocean gyres & western boundary currents, which should be cited here to provide physical understanding, complimentary to those focusing on marine ecosystem changes. Here are a couple of paperps: 1. Wu, L. et al., 2012: Enhanced warming over the global subtropical western boundary currents, Nature Climate Change, 2, 161–166, doi:10.1038/nclimate1353; 2. Hu, D. et al., 2015: Pacific western boundary currents and their roles in climate, 522, 299–308, doi:10.1038/nature14504. [Australia]	Many papers in this area do not deal with the 1.5/2°C issue or two specific impacts that have been observed up until present. I would recommend that these ideas are forwarded to the special report on oceans and cryosphere/AR6
35164	89	43	89	43	The spacing is missing between the words "profoundimpacts" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
45048	89	43	89	43	profoundimpacts --> profound impacts [Hiroaki Kondo, Japan]	Accepted - Text was revised with the suggested edit
50310	89	43	89	43	profound impact: add space [Karina VON SCHUCKMANN, France]	Accepted - Text was revised with the suggested edit
17528	89	44	89	44	Clarify what is meant by "alien" species [David Schoeman, Australia]	Alien species generally refers to invasive species - novel species for a particular region. We have used the latter at most places within the chapter now to make it clearer.
17530	89	46	89	47	Awkward wording, revise [David Schoeman, Australia]	Text has been revised
16262	89	49	90	3	The AMOC is not a regional ocean circulation feature, and not regional compared to the Tasmania reference beforehand in the same paragraph. Also please compare the weakening of the AMOC to changes in other MOC regimes. [Australia]	Accepted: that the text now reflects the central notion of how AMOC is likely to affect regional climates and other current systems.
16264	90	1	90	3	Weakening of the AMOC: not clear how likely this is, let alone how disruptive it would be. Please justify this statement or remove it. [Australia]	Accepted: Text revised. Evidence is assessed as medium agreement, limited evidence.
22044	90	1		49	Please correct spaces between words (e.g. lines 11, 31, 45, 46, 48) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
46750	90	2	90	2	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted:
16266	90	3	90	3	Suggest add how the ocean circulation transport organisms and connects different ecosystems (e.g. important for GBRG coral [Hock, K., Wolff, N. H., Ortiz, J. C., Condie, S. A., Anthony, K. R. N., Blackwell, P. G. and Mumby, P. J.: Connectivity and systemic resilience of the Great Barrier Reef, edited by I. Côté, Plos Biol, 15(11), e2003355–23, doi:10.1371/journal.pbio.2003355, 2017.], but there are many examples. [Australia]	Text has been rearranged and appropriate references cited.
34746	90	3	91	44	This section on ocean circulation is quite sparse, and it is not clear from what is written how changes in circulation might pose risks to human and natural systems beyond a change in eastern boundary upwelling. This comment gives some additional references that might be useful. There is modeling evidence that a slowdown in AMOC increases the proportion of subtropical waters on the North American shelf and Gulf of Maine (Saba et al., 2016). These conditions are known to raise temperatures and lower oxygen concentration in these regions, which can disrupting ecosystems and fisheries (Pershing et al., 2016). Moreover, fluctuations of AMOC is associated with atmospheric circulation changes, such as a strengthening of the Northern Hemisphere storm track (Yamamoto and Palter 2016), which is projected to increase storminess in western Europe in a future with a reduced AMOC (Woolings et al., 2014). This section might also comment on the projected weakening of the Walker Circulation, a common but not universal response of climate models to warming (Plesca et al, 2017). If the Walker Circulation does indeed weaken, it may help slow the pace of expansion/intensification of the Pacific oxygen minimum zone (Deutsch et al, 2014). I think these references (and hopefully others) will make the argument more concrete. References: Pershing, A. J. et al. (2015), Slow adaptation in the face of rapid warming leads to collapse of the Gulf of Maine cod fishery, Science (80-.)., 350(6262). Plesca, E., V. Grützun, S. A. Buehler, E. Plesca, V. Grützun, and S. A. Buehler (2017), How robust is the weakening of the Pacific Walker circulation in CMIP5 idealized transient climate simulations?, J. Clim., JCLI-D-17-0151.1, doi:10.1175/JCLI-D-17-0151.1. Saba, V. S. et al. (2016), Enhanced warming of the Northwest Atlantic Ocean under climate change, J. Geophys. Res. Ocean., 121(1), 118–132, doi:10.1002/2015JC011346. Woollings, T., J. M. Gregory, J. G. Pinto, M. Reyers, and D. J. Brayshaw (2012), Response of the North Atlantic storm track to climate change shaped by ocean–atmosphere coupling, Nat. Geosci., 5(5), 313–317, doi:10.1038/ngeo1438. Yamamoto, A., and J. B. Palter (2016), The absence of an Atlantic imprint on the multidecadal variability of wintertime European temperature., Nat. Commun., 7, 10930, doi:10.1038/ncomms10930. [Jaime Palter, United States of America]	Accepted. However, there is a large amount of information and this special report is aimed at evaluating relevant literature to the issue of 1.5/2°C. While these issues are very important, discussion and treatment in the report is focused on the issue relative to 1.5°C of warming, and what might be avoided in terms of costs and damages if we do not get to 2°C.
18356	90	5	90	27	No comparison of impacts under the two scenarios - yet in SPM there is reference to 1.5 leading to fundamental changes in ocean adidification driving large scale changes. [Andrea TILCHE, Belgium]	Accepted: Text now includes review of fundamental changes at 1.5° C and 2°C - equivalent CO2 concentrations.
21536	90	5	90	27	Are there more recent references for acidification? [Nathalie HILMI, France]	We have added more recent literature on acidification but also have pointed to the extensive review of this area undertaken by AR5.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16268	90	6	90	27	Some reference should be made to the impacts observed in naturally high CO2 seep sites on various aspects of coral reef communities (e.g. Fabricius KE et al 2011 Losers and winners in coral reefs acclimatized to elevated carbon dioxide concentrations. Nature Climate Change doi:10.1038/nclimate1122) and temperate rocky shore communities (e.g. Spencer-Hall JM et al 2008 Volcanic carbon dioxide vents show ecosystem effects of ocean acidification Nature doi:10.1038/nature07051). [Australia]	Accepted: References added.
11146	90	6	90	8	I propose to add Linares et al. (2015) (Proceedings Royal Society B), as it is a clear example of the potential dramatic ecological shifts associated to acidification in habitats and communities dominated by calcareous organisms, with a drastic substitution of habitats dominated by calcicying algae by those dominaed by erect fleshy algae in naturally acidified waters with similar pH values as predicted for the end of the century. [literature: Linares C, Vidal M, Canals M, Kersting DK, Amblas D, Aspillaga E, Cebrian E, Delgado-Huertas A, Díaz D, Garrabou J, Hereu B, Navarro L, Teixidó N, Ballesteros E (2015) Persistent natural acidification drives major distribution shifts in marine benthic ecosystems. Proceedings of the Royal Society B, Biological Sciences 282:20150587.] [Diego Kurt Kersting, Germany]	Accepted: Reference added.
17718	90	6	90	8	Conversely, the general bioreaction (with the exception of caldified organisms directly affected by ocean acidification) is highly uncertain and is thought to be highly dependant on environmental conditions. Rather, it is generally recognized that the numerous risks from ocean acidification to biological systems are less well understood than the ocean chemical changes than can be observed with relatively precised observations. [Republic of Korea]	Accepted:
44486	90	11	90	11	trait-based sensitivities(Kroeker et al., 2013). [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
55314	90	11	90	11	Space before the parenthesis: sensitivies(Kroeker [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
16270	90	14	90	15	By comparison, there is a smaller list of examples of unambiguous impacts of ocean acidification on organisms in the field. see: Moy, A. D., W. R. Howard, S. G. Bray, and T. W. Trull (2009), Reduced calcification in modern Southern Ocean planktonic foraminifera, Nat. Geosci., 2, 276-280, doi:10.1038/ngeo460. [Australia]	Accepted: Reference added.
63000	90	14			Add Ries et al. 2009 citation since Kroeker et al. 2013 is just an bibliographic study whwereas Ries et al. 2009 is experimental. Ries, J. B., A. L. Cohen & D. C. McCorkle, 2009. Marine calcifiers exhibit mixed responses to CO2-induced ocean acidification. Geology 37(12):1131-1134. [Guiomar Rotllant, Spain]	While the alternative paper describes an experimental study, Kroeker et al 2013 rings together a vast amount of research and allows general insights into which organisms are likely to be affected, and which ecological process or ecosystem service may be constrained or modified.
63002	90	15	90	21	Ocean acidification and warming have been proved to affect as well cephalopods and crustaceans by increasing calcification meaning that they expent much more enenergy in their production and that calcification can affect other tissues causing the mortality of the organisms. In these group of animals climate change effect is specially vulvenrable in first life stages. Arnold et al. 2009. Biogeosciences 6, 1747-1754; Dove, A. D. M., 2005. Journal of Fish Diseases 28(5):313-316 ; Hutchings et al. 2008. Vulnerability of benthic invertebrates of the Great Barrier Reef to climate change (Ch 11). In: Johnson, J.E., Marshall, P.A. (Eds.), Australia, pp. 309-356; Pörtner 2008. Mar Ecol Prog Ser 373, 203-217; Rosa et al., 2012. PLoS One 7(6):e38282; Rosa et al., 2014. Differential impacts of ocean acidification and warming on winter and summer progeny of a coastal squid (Loligo vulgaris). J Exp Biol 217(4):518-525.Seibel, B. A., 2016. Physiology 31(6):418-429; Somero 2010. J Exp Biol 213, 912-920; Whiteley 2011. Mar Ecol Progr Ser 430, 257-271; Storch et al. 2011. Mar Ecol Prog Ser 429 157–167 [Guiomar Rotllant, Spain]	For reasons of space, we have been unable to include many hundreds if not thousands of papers on ocean acidification.
55316	90	16	90	16	include [ELISA BERDALET, Spain]	Accepted - Text was revised with the suggested edit
55318	90	17	90	18	This sentence deals about organisms. "polar food webs" refers to ecosystem organization. Furthermore, the references refer all yo "pteropods", at least in the title. [ELISA BERDALET, Spain]	Accepted: here we are referring to Pteropods and the food web contribution that they make.
55320	90	20	90	20	Delete "in flow-through coral field located mesocosms". This refers to the experimental approach used. [ELISA BERDALET, Spain]	Accepted
29710	90	24	90	27	What about change in the energy demand that allow species to calcify close of even below the saturation threshold? (cf. comment n°3). In this perspective, increase turbidity act as a strong cumulative stressor on shallow water corals in addition to direct chemical stressors (e.g. oxygen decrease). (Nadine Le Bris) [Antoine PEBAYLE, France]	Accepted text has been removed due to required shortening of chapter 3 for the FGR review.
1444	90	25		27	Providing one sentence on adaptation options is not worth it because there is not enough detail given to the specifics, which would be necessary. Hence, it might be better focus on the impacts and to leave the responses to chapter 4 [Karen Olsen, Denmark]	Accepted: adaptation options have been moved out of this section and now appear in sections 3.4.4.8 - 3.4.4.10. Our ability to provide information to all issues is limited by the number of pages.
6260	90	25		27	Providing one sentence on adaptation options is not worth it because there is not enough detail given to the specifics, which would be necessary. Hence, it might be better focus on the impacts and to leave the responses to chapter 4 [Anne Olhoff, Denmark]	Accepted: adaptation options have been moved out of this section and now appear in sections 3.4.4.8 - 3.4.4.10. Our ability to provide information to all issues is limited by the number of pages.
18358	90	25		27	Providing one sentence on adaptation options is not worth it because there is not enough detail given to the specifics, which would be necessary. Therefore there needs to be greater clarity in how adaptation coverage is split between Ch3 & Ch4. [Andrea TILCHE, Belgium]	Accepted: adaptation options have been moved out of this section and now appear in sections 3.4.4.8 - 3.4.4.10. Our ability to provide information to all issues is limited by the number of pages.
8140	90	26	90	26	Opening parenthesis after "management" never closed [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
16272	90	27	90	27	Suggest discuss how the surface water is acidifying the most rapidly with clear tipping points when the surface water goes undersaturate and the implication this may have on calcifying organisms. [Australia]	We have taken this on board and have revised text. We have adequate discussion of the impact of calcification on marine organisms at various points within the ocean system section.
16274	90	30	91	3	There is no mention here of how deoxygenation would be different in the 1.5c versus 2C worlds. [Australia]	Accepted: we have added a sentence that indicates that additional warming is likely to increase the deoxygenation and associated issues.
34776	90	30	90	49	The section on deoxygenation (3.4.4.1.5) is missing any reference to the importance of phytoplankton for the world's oxygen supplies. About two-thirds of the planet's total atmospheric oxygen is produced by ocean phytoplankton, and therefore deoxygenation poses risks for depletion of atmospheric oxygen. It would be useful to cite the research by Sekerci and Petrovskii (2015) which highlights that depletion of atmospheric oxygen at high levels of global warming under the RCP8.5 pathway is a possible catastrophic consequence of global warming. See: https://link.springer.com/article/10.1007%2Fs11538-015-0126-0 [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Short paragraph added to capture this important issue,
45618	90	30			I suggest including the experiments of Verspagen et al., 2014 (Verspagen JMH,Van de Waal DB, Finke JF, Visser PM, Van Donk E, Huisman J. 2014. Rising CO2 Levels Will Intensify Phytoplankton Blooms in Eutrophic and Hypertrophic Lakes. PLoS One 9: e104325.) [Adela M Sánchez-Moreiras, Spain]	This section is on ocean systems and not freshwater lakes.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
5314	90	31	90	31	ocean are [Brendon Dunphy, New Zealand]	Not applicable - This text was deleted
6744	90	31	90	31	oceanare' should be 'ocean are' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
10832	90	31	90	31	Change to 'Oxygen concentrations in the ocean are declining due…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
17720	90	31	90	33	The possibility that acidification can accelerate deoxygenation of the oceans has recently been suggested using model experiments. It is necessary that the related description needs to be included in this section. [Republic of Korea]	Accepted: Text reads: Deoxygenation can interact with ocean acidification to present substantial and combined challenges for fisheries and aquaculture (e.g. Bakun et al., 2015; Feely et al., 2016) (medium agreement, medium evidence).
19284	90	31	90	31	add related to climate change after main factors [Spain]	Accepted. Change adopted.
44488	90	31	90	48	Spacing issue in numerous places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
55322	90	31	90	31	oceanare: ocean are [ELISA BERDALET, Spain]	Not applicable - This text was deleted
60466	90	31	90	32	The influence of stratification on deoxygenation is discussed, but the explanation of how and why stratification is changing was never supplied in section 3.4.4.1.1. [United States of America]	Accepted: now reads 'three main climate change related factors. Also - phrase now reads - 'heat related stratification of the water column (less ventilation and mixing)'
55324	90	34	90	34	add: "respiration, respectively" [ELISA BERDALET, Spain]	Not applicable - text has been revised
8142	90	38	90	38	Dead zones has been increasingly *exponentially*: I am not really an expert on this, but the term "exponentially" is mathematically specific, I really doubt that the extent or number of dead zones has been increasing really in an exponential way! Probably you should use another word ("quickly"? "rapidly"?) or simply delete? [Ismael Nunez-Riboni, Germany]	Accepted: 'Exponentially' has been replaced by 'has been doubling each decades since the 1990s (Altieri and Gedan, 2015; Diaz and Rosenberg, 2008; Schmidtko et al., 2017)'
55326	90	38	90	38	increasingly should be "increasing" [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
62712	90	38	90	38	this is an example of the authors merely restating something from the literature, rather than critically assessing it. Exponential increase is not a plausible descriptor of the underlying behaviour -- it is the kind of loose language that will serve as a target for those seeking to find fault with the report (and it matters not that this loose language was used in the published paper being cited). I would note that other publications (e.g. Breitburg et al., Science, 2018, DOI: 10.1126/science.aam7240) provide more careful and better formulated quantification of oxygen loss. [Greg FLATO, Canada]	Accepted: 'Exponentially' has been replaced by 'has been doubling each decades since the 1990s (Altieri and Gedan, 2015; Diaz and Rosenberg, 2008; Schmidtko et al., 2017) - see Altieri and Gedan 2015: Have added Breitburg et al - note assessment has been done in other parts of this section.
54192	90	39	90	39	The expression "increasingly exponentially over the past few decades" may not be appropriate in this context although it is widely used in journalists language to describe a higher than linear increase. For instance, although the increase of oxygen depleted zones is currenlty very high, there are no evidences of an exponential increase. [Jordi Salat, Spain]	Accepted: 'Exponentially' has been replaced by 'has been doubling each decades since the 1990s (Altieri and Gedan, 2015; Diaz and Rosenberg, 2008; Schmidtko et al., 2017)" - see Altieri and Gedan 2015: 'Dead zones created by the depletion of dissolved oxygen in coastal waters are one of the most wide- spread and detrimental anthropogenic threats to marine ecosystems worldwide and have been doubling in occurrence each decade since the mid-1900s (Diaz, 2001; Diaz & Rosenberg, 2008; Vaquer-Sunyer & Duarte, 2008; Gooday et al., 2009; Rabalais et al., 2010).'
2370	90	41			It is a bit surprising that there is not a word in chapter 3 on the impact of climate change on the ocean biological carbon pump (e.g. Boyd, 2015, not cited). Variations in the export of organic carbon would impact the oxygen consumption in the mesopelagic layer. For mid and low-latitudes oceans most current models projections suggest a decrease in global Net Primary Productivity compared to contemporary values (Bopp et al. 2013). This implies a decrease in oxygen consumption in the mesopelagic layer which is contradictory to the expansion of the oxygen minimum zones (page 3-90, line 41). [Paul TREGUER, France]	Accepted: Have added a short paragraph into section 3.4.4.1 on carbon pump (Boyd 2015, Bopp et al 2013)
22046	90	44			Remove brackets in the first block of citations "2008)(Hamukuaya" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
5316	90	45	90	45	especially when [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
6746	90	45	90	45	especiallywhen' should be 'especially when' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10834	90	45	90	45	Change to 'The impact of the deoxygenation, especially when it occurs together…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
45050	90	45	90	45	especiallywhen--> especially when [Hiroaki Kondo, Japan]	Not applicable - This section was rewritten
55328	90	45	90	45	add space: "especiallywhen" [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
5318	90	46	90	46	fisheries (e.g. Bakun [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
55330	90	46	90	46	add space: "fisheries(e.g." [ELISA BERDALET, Spain]	Not applicable - This section was rewritten
5320	90	48	90	48	and reducing [Brendon Dunphy, New Zealand]	Not applicable - This text was deleted
6748	90	48	90	48	andreducing' should be 'and reducing' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
8144	90	48	90	48	Insert space in "andreducing" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
10836	90	48	90	48	Change to 'Maintaining sustainable levels of fish, and reducing intensive…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
44490	90	48	90	48	Define "OMZ" [Rita Man Sze Yu, China]	Accepted:
45052	90	48	90	48	andreducing --> and reducing [Hiroaki Kondo, Japan]	Not applicable - This text was deleted
54194	90	48	90	48	The acronym OMZ must be described since, its meaning does not appear anywhere neither in the present chapter nor in the Glossary. [Jordi Salat, Spain]	Accepted:
55332	90	48	90	48	add space: "andreducing" [ELISA BERDALET, Spain]	Not applicable - This text was deleted
2368	90	49	91	1	Minor point: given that the word “solubility” means “the quality or property of being soluble” this word is improperly used page 3-90/3_91 lines 49/01: “the impacts of climate change on the solubility of oxygen » is a bit ambiguous and should be replaced by “the impacts of climate change on the amounts of oxygen dissolved in seawater”… [Paul TREGUER, France]	Accepted: text removed as part of request to shorten, however, has been removed as part of requested shortening of the chapter.
36436	91		91		There is no mention of variability of coastlines and how this affected by SLR [Snaliah Mahal, Saint Lucia]	This is discussed In 3.3 - this section focuses on impacts.
1446	91	1		3	See above: focus on the impacts [Karen Olsen, Denmark]	Accepted: text is now more focused on the impacts and the ramifications of 1.5° C versus a 2°C world.
6262	91	1		3	See above: focus on the impacts [Anne Olhoff, Denmark]	Accepted: text is now more focused on the impacts and the ramifications of 1.5° C versus a 2°C world.
17532	91	1	91	1	What are "cost benefits"? [David Schoeman, Australia]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
18360	91	1	97	2	Adaptation options are not discussed in detail, nor differentiated in terms of efforts/effectiveness/costs/implications between the 1.5 and 2 degree scenarios. [Andrea TILCHE, Belgium]	there is considerable discussion in each of the sections on adaptation and an evaluation of how much risk is avoided as one proceeds from 1°C to 1.5°C to 2°C. We drew on the primary literature but could not find additional studies which were able to delineate adaptation options with respect to the examples explored according to efforts, effectiveness, costs and implications between 1.5 and 2°C.
6750	91	2	91	2	and point favourable' should be 'and point to favourable' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
1448	91	6		30	What is the difference between 1.5 and 2? Focus! [Karen Olsen, Denmark]	Section has been re-written with focus on differences (or not) of 1.5 vs 2.0oC
6264	91	6		30	What is the difference between 1.5 and 2? Focus! [Anne Olhoff, Denmark]	Section has been re-written with focus on differences (or not) of 1.5 vs 2.0oC
16276	91	6			Aside from the imbalanced treatment of the Antarctic, there is need to mention here the important of Antarctic communities and ecosystems as this relates to sea ice. Krill get a mention on p94 - it would be valuable if the report could provide more coherent connections between the different sections. Line 24-25 illustrate the shortcoming in Arctic focus - the list, while "such as", omits critical species penguins, which we know are already exhibiting significant impacts. This section is also surprising discursive, with general comments and a relative lack of cited impacts and changes. [Australia]	Accepted: have added a short paragraph on Artic/Antarctica and key systems associated with warming and loss of sea ice. Particularly focused on differences between 1.5-2.0 focus
16278	91	6	91	30	No mention of Southern Ocean or other non-Arctic sea ice please amend. [Australia]	Accepted: has added.
16280	91	6			This sea ice section largely neglects Antarctica and needs significant additional information, here and later in section 3.4.4.1.6 (p56 - these comments are repeated at both points). While this omission appears to be done on the basis that the ability to project with confidence is low, it overlooks that much is known about drivers and impacts of changes already seen. The rate of change in sea ice in the Western Antarctic Peninsula, for example, is greater than in the Arctic (Massom and Stammerjohn, 2010 doi:10.1016/j.polar.2010.05.001). The report should describe the change that has been seen (modest increase over the satellite era, recently with dramatic reversal, and importantly *large* regional and seasonal changes which make e.g. Antarctic Pensinsula equally a hot spot to the Arctic). This can be done following National Academies report and refs therein (National Academies of Sciences, Engineering, and Medicine. 2017. Antarctic Sea Ice, Variability in the Southern Ocean-Climate System. Washington, DC: The National Academies Press. doi:10.17226/24696.). For a review of Southern Ocean sea ice, their drivers and forcings refer to Hobbs W., R. Massom, S. Stammerjohn, et al.. 2016. A Review of recent changes in: Global and Planetary Change, 143, 228-250. Also see Turner and Comiso 2017, doi:10.1038/547019a. For details of Amundsen sea (large changes) see: Stammerjohn, S.E., et al. 2015. Seasonal sea ice changes in the Amundsen Sea, Antarctica. Elementa: Science of the Anthropocene – Ocean, 3, 000055, doi:10.12952/journal.elementa.000055. [Australia]	Accepted: have added a short paragraph on Artic/Antarctica and key systems associated with warming and loss of sea ice. Particularly focused on differences between 1.5-2.0 focus
18362	91	6		30	Focus on what knowledge we have related to 1.5°C & 2°C. [Andrea TILCHE, Belgium]	Section has been re-written with focus on differences (or not) of 1.5 vs 2.0oC
9572	91	7		8	This sentence doesn't begin to capture the full extent of the meaning of sea ice for Arctic communities and this is a very important point that can not be overlooked. Sea ice doesn't only provide livelihoods for Arctic communities. Sea ice is an integral part of well-being, culture, food security, subsistence, health, and the list goes on. To simplify this to 'livelihoods' as is done in this current version fails to communicate the importance of sea ice to Inuit and Arctic communities. I urge you to look at two reports from the Inuit Circumpolar Council on sea ice (links in this comment below) and incorporate them here to fully articulate what sea ice means for Inuit so that the impacts on sea ice are properly understood and articulated in this chapter. http://www.inuitcircumpolar.com/uploads/3/0/5/4/30542564/20080423_iccamsa_finalpdfprint.pdf http://www.sdwg.org/wp-content/uploads/2016/04/Inuit-Response-to-AMSA-Final-Report.pdf [Joanna Petrasek MacDonald, Canada]	Section has been re-written with focus on differences (or not) of 1.5 vs 2.0oC
22050	91	7		27	Please review these lines and correct spaces between words (e.g. lines 11, 24, 27) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
31062	91	7	91	7	indeed, the sea ice has been described as a key ecosystem service in the Arctic. See Eicken et al (2009) in Arctic [James FORD, Canada]	Noted:
61888	91	7	91	30	again lots of repetations with earlier sections including revisiting the same pool of literature. Please be explicit about "industries". The whole second paragraph lacks references while mentioning "a survey of the literature" (while the report is expected to provide not a survey but an assessement, including an assessment of the methods). Conclusions should be provided with traceability to the literature, especially for high confidence. [Valérie Masson-Delmotte, France]	Accepted: repetition has been reduced between this section (on impacts) with previous sections (3.3.9) on physical changes. And have resolved issues to do with the mention of industries - synergised with later sections.
11110	91	9	19	13	statements refer to minimum sea ice extend (September). This should be made clear in the text. [Denmark]	Accepted:
34100	91	9	91	12	This statement seemed inconsistent with the projections of sea ice in 3.3.9 Sea Ice. Please consider to provide a clear conclusion from 3.3.9 that can be reused in 3.4.4.1.6 Sea Ice. [Norway]	Accepted: Have removed paragraphs referring to physical changes so far - moving the impacts within this current section.
5322	91	10	91	10	possible in italics? [Brendon Dunphy, New Zealand]	Not applicable - This text was deleted
2282	91	11	91	12	Citing Niederdrenk and Notz (GRL2018) as saying it is "virtually certain » that the Arctic will be ice-free in September at +2C is problematic for two reasons. 1) Using IPCC uncertainty language for a single paper might induce a bit of confusion; you might want to reserve these expressions for your own assessment. 2) More importantly, the paper is not cited correctly. A key point of the paper is that (quote) « September sea ice might vanish for 2.0C global warming, but observational uncertainty prevents a conclusive statement ». This is very different than a « virtually certain » ice disappearance. [gerhard Krinner, France]	Accepted: text has been extensively revised and placed together with the section which discusses the physical changes in sea ice
3170	91	11			Space between 'virtuallycertain' is needed [Kalen Ola, Sweden]	Accepted
5324	91	11	91	11	..Notz) [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
8146	91	11	91	11	Insert space in "'virtuallycertain" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
12884	91	11			There should be a space between "virtually" and "certain" [Marie-Jeanne S. Royer, Canada]	Not applicable - This section was rewritten
22048	91	11			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22052	91	11			Remove double bracket in "Notz))" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
34102	91	11			The year for the reference for Niederdrenk and Notz is missing, one can assume that it is the same as in the line before (2017). [Norway]	Not applicable - This section was rewritten
45054	91	11	91	11	virtuallycertain --> virtually certain [Hiroaki Kondo, Japan]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
2284	91	12	91	13	The Screen and Williamson paper says (quote) « the 2 °C target may be insufficient to prevent an ice-free Arctic » and attach a 39% chance for an ice-free Arctic in that case. That seems very different from what you pretend the paper says (« will be insufficient to prevent total loss »). [gerhard Krinner, France]	Accepted: text has been extensively revised and placed together with the section which discusses the physical changes in sea ice in 3.3.
12886	91	12			…targets of 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
5614	91	13	91	13	. Arctic sea ice(Screen and Williamson, 2017). …rewrite Arctic sea ice (Screen and Williamson, 2017). ?.....there are many misspelling in the entire text…please check them all…I have pointed out some of them. [Sandra CASSOTTA, Denmark]	Not applicable - This section was rewritten
8148	91	13	91	13	Inssert space in " ice(Screen" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
16282	91	18			There doesn't appear to be a "3.1.9" in this chapter. [Australia]	Accepted. Text revised and correct links inserted.
34104	91	19	91	22	Note that there are phyto- and zooplankton living inside the ice as well, called sea ice biota. Sea ice is an important Arctic habitat that supports a rich diversity of species - many of which we know little about. Please consider to include this information. [Norway]	Accepted: have included references to organisms living inside ice.
46752	91	20	91	20	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted
5326	91	22	91	22	radiation (Meier [Brendon Dunphy, New Zealand]	Accepted - Text was revised with the suggested edit
8150	91	22	91	22	Insert space in "radiation(Meier" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
5328	91	23	91	23	system (Cheung [Brendon Dunphy, New Zealand]	Not applicable - This section was rewritten
8152	91	23	91	23	The same in "system(Cheung" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
9574	91	25		30	This text indicates that the culmulation of impacts on the Arctic environment will increasingly impact people, infrastructure, and industries. It goes on to note that the rate of change exceeds the adaptive capacity of many communities and that adaptation options must be considered alongside other challenges but that these aspects will be explored in later chapters of the report. This falls short of what I expect this chapter to deliver, which is a discussion on the impacts on both natural and human systems. In this chapter, the discussion on the natural system is extensive but not equally matched with a discussion on the human system. Either it should be very clearly identified WHICH future chapters will explore the broad (but very important) points made above (and direct readers to exactly what sections of these chapters deliver this) or the discussion should be included here. This discussion should extensively cover what impacts on humans result from the environmental changes described (food, physical health, mental health, tourism, local economies, transportation, culture, etc). Furthermore, if adaptation is brought up (as it is currently), then it is unfair to broadly describe the adaptation context as one facing rapid change and challenges without also noting that communities ARE adapting and there are many innovative adaptation strategies coming out of Arctic communities that could be role models for other regions of the world. While Arctic communities do face multiple challenges, it is not appropriate to frame them as vulnerable without also noting what communities ARE doing and the incredible adaptability and resilience of Inuit. [Joanna Petrasek MacDonald, Canada]	Accepted. However, this section of the report focuses in on ecosystems and broad human systems and their response to 1.5°C and 2°C warming (see 3.3.9 for greater detail on sea ice loss and dynamics. In later parts of this chapter, issues such as food security, human health, permafrost, urban areas, and a range of other issues are dealt with - with increasing focus on adaptation options and strategies to minimise the impact of achieving 1.5°C - as well as issues such as the advantages of avoiding 2°C. Issues like food, physical health, mental health, tourism and local economies et cetera come up in chapters 4 and 5.
16284	91	25	91	25	To be consistent with the hyphenation of sea ice in this chapter change “Sea ice loss” to read “Sea-ice loss”. [Australia]	We have taken this on board and adopted a consistent way of referring to CRS.
31064	91	25	91	27	better references than Meier et al (a physcial science paper) exist for illsutrating the impacts of sea ice change on people! There is a well developed scholarship on the human dimensions of climate change that should be drawn upon - start with the Arctic Council AACA assessment or Arctic Resilience Report [James FORD, Canada]	Accepted: text has been extensively revised and placed together with the section which discusses the physical changes in sea ice in 3.3.
8154	91	27	91	27	And in "industries(Meier et al., 2014b)" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
31066	91	27	91	28	Rates of change currently exceed the ability of many communities to keep up with the many associated challenges. Where is this statement drawn from? There are indeed adaptation challenges but the scholarship is more nuanced than this. See Ford et al 2015 in Nature Climate Change. And what does "many communities" actually mean? there are huge differences in the types of community in the Arctic, for which CC poses many different risks and to which there are different vulnerabilities. In short, the statement I highlight can not be justified based on the scholarship we have, [James FORD, Canada]	Accepted: have modified text into include reference to full detail 2015, and have linked to more substantial references.
1450	91	33		44	Is 3cm the difference between 1.5 and 2°C in terms of sea level rise? If yes, say it clearly. And what does 3cm mean in terms of impacts? The value itself is not impressive, but it means x km2 of more land lost, y millions of more people affected, z amounts of more coastal environments destroyed. All of these impacts come at a cost. [Karen Olsen, Denmark]	Accepted: have added information on expected sea level rise at 1.5°C versus 2°C.
6266	91	33		44	Is 3cm the difference between 1.5 and 2°C in terms of sea level rise? If yes, say it clearly. And what does 3cm mean in terms of impacts? The value itself is not impressive, but it means x km2 of more land lost, y millions of more people affected, z amounts of more coastal environments destroyed. All of these impacts come at a cost. [Anne Olhoff, Denmark]	Accepted: have added information on expected sea level rise at 1.5°C versus 2°C.
8156	91	33	91	44	I recommend taking also a look to this new article, where it has been shown that the sea level is apparently increasing even faster than what we though up to now: http://www.pnas.org/content/early/2018/02/06/1717312115 [Ismael Nunez-Riboni, Germany]	Accepted: Article considered
9786	91	33	91	44	Subsection 3.4.4.1.7 is supposed to cover observed impacts from sea level changes. There is hardly any substance provided. The reference to section 3.3.10 is also misleading as no details on coastal habitat restoration as a cost effective response is provided there really. This section (if kept) needs to be substantially revised. [Alexander Nauels, Australia]	Accepted: we have reorganised the text. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
18364	91	33		44	Is 3cm the difference between 1.5 and 2°C in terms of sea level rise? If yes, say it clearly. And what does 3cm mean in terms of impacts? The value itself is not impressive, but it means x km2 of more land lost, y millions of more people affected, z amounts of more coastal environments destroyed. All of these impacts come at a cost. [Andrea TILCHE, Belgium]	Accepted: have added information on expected sea level rise at 1.5°C versus 2°C.
49206	91	33	91	44	This section is very problemaric. It is not in line with the findings from above (3.3.10) and does not at all reflect on the risks posed by SLR in an adequate fashion. Much more literature is out there looking at people indundated, land lost etc. that should be integrated here. I understand that this information is available in Tab S4 and don't know, why it is not integrated here. [Bill Hare, Germany]	Accepted: we have reorganised the text. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
49960	91	33	91	45	How about the flood risks in coastal areas due to sea level rise or tidal wave? A sentence may help readers to understand the context and circumstance. Also a brief information on distinguishing between climate extremes and climate related hazards. [Perdinan Perdinan, Indonesia]	Accepted: these flood risks have been considered as part of the section on coasts and low-lying regions and sea level rise.
17534	91	34	35	34	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This section was rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
18366	91	34	91	35	Mentaschi et al. (2018), see previous comment, is relevant also here. [Andrea TILCHE, Belgium]	Accepted and considered. We encourage submission to the special report on oceans and cryosphere.
40310	91	34	91	44	Studies estimated that in Egypt 30% of the Delta and Alexandria coast is vulnerable, 55% is “invulnerable” and 15% was artificially protected in 2003. High-risk areas in and near the Delta include parts of Alexandria, Behaira, Damietta and Port Said governorates. (Reference: Third National Communication Reports of Climate Change in Egypt (2016). http://www.eg.undp.org/content/egypt/en/home/operations/projects/climate-and-disaster-resilience/egypt_s-third-national-communication-to-the-unfccc.html [Amal Hussein, Egypt]	Accepted: we have reorganised the text. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
61890	91	34	91	35	Please provide the evidence for the statement that rising sea levels are already having serious impacts. This is not fully consistent with AR5 statements. This part seems quite superficial rather than an assessment. [Valérie Masson-Delmotte, France]	Accepted: we have reorganised the text. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
53694	91	35	91	35	SLR induced salinity intrusion can be added which adversely impact the agriculture and fresh water resources [AKM SAIFUL ISLAM, Bangladesh]	Accepted and considered
572	91	36	91	37	Many RCP 2.6 simulations are above 1.5°C by 2100, while most RCP 4.5 simulation exceed 2.0°C. Did the authors forgot to baseline to preindustrial? [Robert Koppu, United States of America]	Accepted: We have reorganised the text (and specific text integrated other relevant sections. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts of SLR occurring in the following after ocean systems - on section on coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
2286	91	36	91	37	«Minimal differences exist between RCP2.6 versus RCP4.5 (bracketing a 1.5?C scenario) ». This does not seem correct. Even RCP2.6 attains almost +2?C in global mean annual surface air temperature increase with respect to the preindustrial, which is what the 1.5?C target is about (see, for example, Figure 10 of the AR5 WGI SPM). In addition, the "minimal differences" refer to 2100, which is somewhat misleading, because on the longer term, there may be differences (see section 3.3.10 - this section might draw more heavily on the assessment provided in section 3.3.10). [gerhard Krinner, France]	Accepted: We have reorganised the text (and specific text integrated other relevant sections). The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
9782	91	36	91	37	This statement is wrong, very dangerous and misleading! Again, RCP4.5 doesn't bracket any 1.5degC pathways. The numbers cited from Table 3.3 cannot be found (what is the reference period anyway). In fact, very distinct and significant differences exist between RCP2.6 and RCP4.5 SLR projections (see WGI AR5 SPM figure SPM.9, almost 10cm more GMSLR in 2100 is very significant)! This current assessment is even more worrying, because SLR does not stop in 2100. As can be seen, for example, in Figure A.4 and A.5 in Nauels et al. 2017, the differences become even more pronounced post 2100. Also, SLR statements in an IPCC report cannot simply cite averages. Uncertainty ranges have to be included, in particular given the new findings regarding Antarctic dynamics that blow up the ranges and central estimates for the higher emission pathways. [Alexander Nauels, Australia]	Accepted: We have reorganised the text (and specific text removed). The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
49204	91	36	91	37	Minimal differences exist between RCP2.6 vs RCP 4.5 in terms of sea level rise - on what timescale is this? What about equilibrium SLR? [Bill Hare, Germany]	Accepted: We have reorganised the text (and specific text integrated other relevant sections). The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
574	91	37	91	37	Sea level numbers are not consistent with Table 3.3 (which is problematic in and of itself, see comment elsewhere) [Robert Koppu, United States of America]	Accepted: We have reorganised the text (and specific text integrated other relevant sections). The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
2288	91	37	91	37	Table 3.3 seems to be cited incorrectly, because the RCP4.5 sea-level change for 2090-99 given there is +68 cm, not +63. Please check. [gerhard Krinner, France]	Accepted: We have reorganised the text (and specific text integrated other relevant sections). The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
9784	91	37	91	38	by how much? This statement is useless because that's obvious. [Alexander Nauels, Australia]	Accepted: text removed.
56006	91	37	91	37	Add, "…sea-level rise by 2100, although several meters may separate these temeperatures on longer time scales." Clarification needed for consistency with other sections noting a new stabilization SLR level difference of potentially many meters. [Pamela Pearson, United States of America]	Text has been revised.
22054	91	38			Add "and" to link mangroves and seagrasses [LUIS VALDES, Spain]	Not applicable - This section was rewritten
16286	91	40	91	44	Also mention the option of planned retreat of coastal ecosystems as sea levels rise. [Australia]	Accepted: we have reorganised the text. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.
36434	91	42	91	45	There needs to be recognition of the fact that the list of options for responding to sea level rise possible under various levels and in all places. [Snaliah Mahal, Saint Lucia]	Accepted: we have reorganised the text. The treatment of sea level in terms of global and regional impacts occurs in 3.3 - with an extensive treatment of the impacts occurring in the section coasts and low-lying regions and sea level rise. As a result, we have reduced the text the ocean systems section to a minimum.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1452	92	4		13	This entire paragraph seems to say that all the relevant information is in the supplementary information in the annex. That means the reader is now asked to go online and look for that section to get the information because the writing team is unable to prioritize and make hard choices. Put the most important information together in an overview form so the reader understands the issues and then show the differences between now, 1.5 and 2. It's not really that hard. [Karen Olsen, Denmark]	We look carefully at different options and, given the large amount of detail behind the assessment, chose to put the formal assessment online. Given the scope of the chapter and its available space, we were not able to put and effective summary in the text. That said, we have an effective summary of the assessment and the means by which the reader can explore the basis for the assessment consensus online if he/she would like to do that.
6268	92	4		13	This entire paragraph seems to say that all the relevant information is in the supplementary information in the annex. That means the reader is now asked to go online and look for that section to get the information because the writing team is unable to prioritize and make hard choices. Put the most important information together in an overview form so the reader understands the issues and then show the differences between now, 1.5 and 2. It's not really that hard. [Anne Olhoff, Denmark]	We look carefully at different options and, given the large amount of detail behind the assessment, chose to put the formal assessment online. Given the scope of the chapter and its available space, we were not able to put and effective summary in the text. That said, we have an effective summary of the assessment and the means by which the reader can explore the basis for the assessment consensus online if he/she would like to do that.
22056	92	4			Replace "Gatusso and colleagues" by "Gatusso et al. (2015)" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
18368	92	4		13	This entire paragraph seems to say that all the relevant information is in the supplementary information in the annex. That means the reader is now asked to go online and look for that section to get the information. We sugges to put the most important information together in an overview form so the reader understands the issues and then show the differences between now, 1.5 and 2. [Andrea TILCHE, Belgium]	We look carefully at different options and, given the large amount of detail behind the assessment, chose to put the formal assessment online. Given the scope of the chapter and its available space, we were not able to put and effective summary in the text. That said, we have an effective summary of the assessment and the means by which the reader can explore the basis for the assessment consensus online if he/she would like to do that.
61892	92	4	2	5	You are not expected to describe what Gattuso et al have done but to perform an assessment of the literature, the underlying methods, the robust findings and knowledge gaps. [Valérie Masson-Delmotte, France]	The formal assessment of the literature by Gattuso (of which I am an author and participant) assesses the literature post AR5 and before late 2015. This first assessment was published - we now build on that by assessing the literature from late 2015 to present. in addition to wanting transparency, the power of the assessment has been increased due to the two phases of assessment.
16288	92	8	92	8	Levels of risk are adjusted in a 'bad' direction - this is an important finding that should be clearly stated, and also included in the chapter 3 summary and in the SPM. [Australia]	Accepted: text added.
12888	92	10			…compared to 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Editorial - copyedit to be completed prior to publication
217	92	16	93	35	Section: 3.4.4.2.1 Framework organisms (corals, mangroves and seagrass)- the whole section should be rewritten.See above suggestions/comments. Even simple phrases are not correct. For example, the opennig statement:"A number of marine species (e.g. seagrass meadows, kelp forests, oyster reefs, salt marsh, mangrove forests and coral reefs)"- the listed habitats/ecosystems are NOT marine species! [Baruch RINKEVICH, Israel]	Accepted: have modified text accordingly and have removed ambiguity between species and ecosystem and frameworks organisms et cetera.
5616	92	16	93	34	. 3.4.4.2.1 Framework organisms (corals, mangroves and seagrass) [Sandra CASSOTTA, Denmark]	Accepted: Text modified accordingly.
5618	92	16	93	34	. I also think that this section should be splitted in 1) coral, 2) mangroves and 3) seagrass. [Sandra CASSOTTA, Denmark]	Due restrictions on space, we were unable to do this.
29726	92	16	92	16	Confusion between organisms and ecosystems: corals are organisms but mangrove and seagrass are ecosystems constituted by framework organisms. [Antoine PEBAYLE, France]	Accepted: Text modified accordingly.
37180	92	16	92	16	Confusion between organisms and ecosystems [Françoise Gaill, France]	Accepted: Text modified accordingly.
46034	92	16	92	16	Due to the importance of coastal peat lands for the stability of the coast and as mentioned before for the carbon storage they should also be considered in the chapter of framework organism. Keep in mind that the large part of the Ijselmeer in the Netherlands and wadded sea are eroded peat lands! Destroying coastal peat lands strongly favors coastal erosion and according to current estimates their degradation contributes about 10% to the CO2 emission caused by land use changes. This should not be ignored. [Tim Rixen, Germany]	Accepted: have added mention below in section on key ecosystem services (carbon uptake, coastal protection, and coral reflect creation)
1552	92	17	93	34	Iam still disappointed (as I stated in the FOD review) that there is no information presented on expected impacts on temperate-latitude deep-water coral systems, which I understand are also an important ecosystem and quite vulnerable especially to ocean acidification. While I take the point now made in Box 3.6 that literature on deep water corals is sparse compared to that on tropical shallow corals, I understand there still is some literature. So while I am comfortable for Box 3.6 to focus on tropical corals, I'd like to see something here in Section 3.4.4.2.1 about deep water corals. I suggest you could contact Dr Cliff Law at NIWA (cliff.law@niwa.co.nz) for some advice / publications on this matter. [David Wratt, New Zealand]	Accepted: Have added a few sentences to ensure that the issue is not lost. The problem is that we were unable to be comprehensive on many key issues and evidence in the so-called special reports. The special reports are not intended to be comprehensive, which is the role played by the main assessment reports. Reviewers are advised to provide input into the next report, AR6 on this important issue.
29728	92	17	92	18	Seagrass meadows, kelp forests, oyster reefs, salt marsh, mangrove forests and coral reefs are not marine species but ecosystems. [Antoine PEBAYLE, France]	Accepted: Text modified accordingly.
37182	92	17	92	18	Seagrass meadows, kelp forests, oyster reefs, salt marsh, mangrove forests and coral reefs are not marine species but ecosystems. [Françoise Gaill, France]	Accepted: Text modified accordingly.
60468	92	17	92	44	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted: We have looked carefully at the text and have applied calibrated assessment language and likelihoods where possible. This section has updated burning ember diagrams which illustrate the risk at one, 1.5 and 2°C. Without the detail upfront, it's hard to understand what these risks changes mean.
54682	92	18	92	19	Mention other habitat builder like cold water corals, gorgonian, sponges garden. Litterature has been growing on their sensitivities. [Nadine Le Bris, France]	Accepted: have added mention of cold water corals and other related groups where there is literature available.
16290	92	24	92	33	Hughes et al (2017) do not provide evidence for 50% mortality of Great Barrier Reef corals. Hughes et al (2017) only relates to shallow corals and only considered the 2016 bleaching on the Great Barrier Reef and not that in 2017. For 2016, evidence of 29% shallow-water coral cover loss across the Great Barrier Reef Marine Park is provided in GBRMPA 2017 Final report: 2016 coral bleaching event on the Great Barrier Reef, GBRMPA, Townsville at http://hdl.handle.net/11017/3206. This event has been cleary linked to heat stress and greenhouse gas warming (see e.g. Lewis & Mallela, chapter 28 in the Bulletin of the American Meteorological Society's special report on climate extremes DOI:10.1175/BAMS-D-17-0074.1.). Evidence for more frequent coral bleaching events worldwide is provided in Hughes et al 2018 Spatial and temporal patterns of mass bleaching of corals in the Anthropocene. Science 359:80-83., and by Heron et al 2017 Scientific Reports. [Australia]	Accepted: Have modified information on the latest GBR events with appropriate use of references identified and others.
34106	92	24	92	25	Please consider including "tropical" before "corals" as this concerns the tropical reefs and not the cold water coral reefs [Norway]	Accepted - have added where appropriate

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41408	92	24	92	26	Has this strengthening of evidence led to a confidence level for these findings? [Lourdes Tibig, Philippines]	Accepted: The latest assessment has found grounds to adjust the levels of risk in a couple of categories.
7608	92	26	92	26	...(Normile, 2016).. add new papers by Hughes et al., 2018 on coral mortalities since satellite observations started, same in line 28 [Jens Zinke, Germany]	Accepted: Have modified information on the latest GBR events with appropriate use of references identified and others.
7610	92	32	92	32	..(Babcock et al.)… public. Year missing [Jens Zinke, Germany]	Not applicable - This text was deleted
8158	92	32	92	32	Why Babcock et al. without year? [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
10838	92	32	92	32	Change to 'Australia's coastal resources that…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
11148	92	32	92	32	(Babcock et al.) year or "submitted" is missing [Diego Kurt Kersting, Germany]	Not applicable - This text was deleted
12890	92	32			The reference to Babcock et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
12892	92	32			reources should be "resources" [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
44492	92	32	92	32	Year is missing "(Babcock et al.)" [Rita Man Sze Yu, China]	Not applicable - This text was deleted
1454	92	33			European history' is unclear. Better refer to years [Karen Olsen, Denmark]	Accepted: This refers to the nonindigenous history of Australia which was essentially European in its beginnings. Understand that references not likely to be understood and thereby have removed it.
6270	92	33			European history' is unclear. Better refer to years [Anne Olhoff, Denmark]	Accepted: This refers to the nonindigenous history of Australia which was essentially European in its beginnings. Understand that references not likely to be understood and thereby have removed it.
18370	92	33			European history' is unclear. Better refer to years [Andrea TILCHE, Belgium]	Accepted: This refers to the nonindigenous history of Australia which was essentially European in its beginnings. Understand that references not likely to be understood and thereby have removed it.
49962	92	35	92	36	The authors used the term of "Risks of climate change impacts", as Box 3.1 distinguish the definition of Risk and Impact, should we change to potential of… [Perdinan Perdinan, Indonesia]	Accepted
6752	92	36	92	36	byShort' should be 'by Short' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7612	92	36	92	36	..by Short et al. (2016)… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8160	92	36	92	36	Space in byShor [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10840	92	36	92	36	Change to 'group led by Short et al. (2016)….' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
11150	92	36	92	36	byShort et al. (2006), spacing typo [Diego Kurt Kersting, Germany]	Accepted - Text was revised with the suggested edit
22058	92	36			insert space between "byShort" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
41410	92	36	92	42	Confidence levells? [Lourdes Tibig, Philippines]	Accepted: calibrated assessment language added and likelihood where possible.
44494	92	36	92	44	Spacing issue in 3 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
54196	92	39	92	39	which is consistent with evidence and concern of others. Which others? There is somethng missing in this sentence. [Jordi Salat, Spain]	Accepted: text rewritten
8162	92	44	92	44	Space in levels(Valle [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
22060	92	44			insert space between "levels(Valle" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
16292	92	46	92	47	At present day, coral reefs are already at high risk (not moderate-high' as stated here) as per SI_S3-4-4_Supp Information on Ocean Systems (Update of Gattuso et al.) p50 indicates experts thought the transition from high to very high occurs between 0.7C and 1.5C. p54 line 24 states "current conditions being of high risk". The severity of the recent bleaching of Great Barrier Reef shows the potential of climate change to cause harm that cannot be remediated through management or adaptation. Coral disease risk also predicted to increase with further warming. [Australia]	Accepted: the reviewers make some very good points and consequently the text has been modified to reflect the assessment outcomes presented in the accompanying burning embers figure and elsewhere.
34108	92	46	92	47	Since this conclusion concerns tropical corals, please include "tropical" before "corals" in the sentence. [Norway]	Accepted: have done so.
16294	92	48	92	49	At 1.5C coral reefs appear to be at 'very high' risk (not 'high' as stated here) as per SI_S3-4-4_Supp Information on Ocean Systems (Update of Gattuso et al.) p50 indicates experts thought the transition from high to very high occurs between 0.7C and 1.5C. This is supported by several papers, including Hoegh-Guldberg et al. 2007. Science 318:1737–42; Schleussner, C.F., et al. 2016, Differential climate impacts for policy-relevant limits to global warming: the case of 1.5 °C and 2 °C, Earth System Dynamics 7(2): 327-351;). Ainsworth, T.D., et al. (2016) Climate change disables coral bleaching protection on the Great Barrier Reef. Science, 352: 338-342. [Australia]	Accepted: the reviewers make some very good points and consequently the text has been modified to reflect the assessment outcomes presented in the accompanying burning embers figure and elsewhere.
54198	92	49	92	49	high risks high must be written in italics [Jordi Salat, Spain]	Editorial - copyedit to be completed prior to publication
16296	93	3	93	3	By 2degC coral reefs were already at very high risk (not 'reaching' it as stated here) as per SI_S3-4-4_Supp Information on Ocean Systems (Update of Gattuso et al.) p50 indicates experts thought the transition from high to very high occurs between 0.7C and 1.5C. Also, Figure 3-19 bar for corals does not appear to match the transitions indicated on p50 os SI-S3-4-4 hence the figure should be reviewed carefully. As mentioned earlier, consider adding a 5th more severe risk category. [Australia]	There are different perspectives on this issue with a considerable body of literature which suggests that managing non-climate stress on reefs can have an impact on the success and rate of recovery (Hughes et al. 2003). It is also debatable whether the removing of stress and ensuring that coral reefs are more resilient as a form of adaptation. In this non-genetic use of the term, adaptation - we are referring to the fact that reducing stressors enhances the ability of coral reefs to recover from a mortality event. This is no different to building a seawall as an adaptation to rising sea levels. What we are referring to here, are actions that reduce the overall impact of a thermal event, by promoting more rapid and complete recovery.
46754	93	5	93	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted: text rewritten

Comment No	From Page	From Line	To Page	To Line	Comment	Response
210	93	10	93	13	This sentence wrongly implies that reducing of non-climate change pressures (e.g. coastal pollution, overfishing, destructive coastal development) will ensure the recovery of ecosystems from accelerating climate change impacts. Revise.You may say that it will help to increase resilience, but there is no assurance that it will be effective enough. Additionally,reducing of non-climate change pressures are NOT 'Adaptation options', as stated. [Baruch RINKEVICH, Israel]	There are different perspectives on this issue with a considerable body of literature which suggests that managing non-climate stress on reefs can have an impact on the success and rate of recovery (Hughes et al. 2003). It is also debatable whether the removing of stress and ensuring that coral reefs are more resilient as a form of adaptation. In this non-genetic use of the term, adaptation - we are referring to the fact that reducing stressors enhances the ability of coral reefs to recover from a mortality event. This is no different to building a seawall as an adaptation to rising sea levels. What we are referring to here, are actions that reduce the overall impact of a thermal event, by promoting more rapid and complete recovery.
214	93	10	93	21	The whole paragraph needs rewriting [Baruch RINKEVICH, Israel]	Accepted: edited to improve clarity of messages.
34778	93	10	93	21	Some potentially crucial ecosystem based adaptation options are missing from this paragraph such as coral reef restoration and active management to grow stress-tolerant varieties. These adaptation options should be mentioned. See Mascarelli, 2014. https://www.nature.com/news/climate-change-adaptation-designer-reefs-1.15073. This includes low-cost and environmentally sustainable coral reef restoration methods modeled after natural coral reef recovery processes (Bowden-Kerby, 2001). See: http://www.ingentaconnect.com/content/umrsmas/bullmar/2001/00000069/00000002/art00052 [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Accepted: text modified.
60470	93	10	93	13	Add Ellison (2013), https://link.springer.com/chapter/10.1007/978-1-4614-8582-7_18 [United States of America]	Accepted
209	93	11	93	11	split between the words-coastaldevelopment [Baruch RINKEVICH, Israel]	Accepted - Text was revised with the suggested edit
6754	93	11	93	11	coastaldevelopment' should be 'coastal development' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7614	93	11	93	11	...coastal development)… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
10842	93	11	93	11	Change to '...destructive coastal development) to ensure…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
22062	93	11		48	Please review these lines and correct spaces between words (e.g. lines 11, 25, 30, 39, 48) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
211	93	13	93	16	This sentence is not clear. Primarily: "concentrating adaptation efforts"- what is the meaning of this phrase?, and , what are the "efficient and effective use of resources"? Delete or replace this sentence. [Baruch RINKEVICH, Israel]	Accepted: have rewritten section and removed the confusing text. I've also shortened and made clearer reference to refuge and the degree of agreement and evidence based on the literature.
16298	93	13	93	15	The Great Barrier Reef 'Blueprint for resilience' could be cited here and is available from www.gbrmpa.gov.au at http://hdl.handle.net/11017/3287 The blueprint signals the actions GBRMPA will take with our partners, to strengthen the Reef's resilience — it's capacity to recover after disturbances and return to a healthy state — to the challenges it's facing now and in the future. [Australia]	Accepted and considered
212	93	16	93	16	What is the meaning of "In this case"? How this phraseconnects to the above sentence? [Baruch RINKEVICH, Israel]	It is the case of refuges etc - as explained in the text.
16300	93	16	93	17	The recent study of Muir PR et al (2017 Species diversity and depth preduct bleaching severity in reef-building corals: shall the deep inherit the reef? Proceedings Royal Socity-B, doi:10.1098/rspb.2017.1551) is relevant regarding deeper water refuges for tropical corals. [Australia]	Accepted and considered
16302	93	18	93	18	Also, recent references by VanOppen, Gates and others available on assisted evolution as an approach and links to figure 3-20. e.g. Van Oppen et al 2017 Global Change Biology (2017), doi: 10.1111/gcb.13647 [Australia]	Accepted and considered
16304	93	18	93	18	While these actions to reduce pressures and build resilience remain crucial, environmental management efforts can only compensate for reduced coral reef resilience in the face of climate change to a limited extent and over a limited timeframe. Anthony K.R.N., 2016, Coral reefs under climate change and ocean acidification: challenges and opportunities for management and policy. Annual Review of Environment and Resources 41: 59-81 [Australia]	Accepted and considered
213	93	19	93	19	helping repair ecosystems- how efforts for preventing the los of regions (such as refugia) will help in repair ecosystems? Which ecosystems? Same or others? If same- as they are not damaged how they are going to be repaired? Explain and revise. [Baruch RINKEVICH, Israel]	Accepted and revised
46756	93	19	93	19	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted and revised
22064	93	21			There is a "but see" disconnected from any assert. I thing that something else is needed to support this "but see" [LUIS VALDES, Spain]	Accepted - text has been revised
44496	93	21	93	21	Reference formatting issue "but see (Pim Bongaerts et al. 2017; Chollett, Mumby, and Cortés 2017)" [Rita Man Sze Yu, China]	Accepted - text has been revised
215	93	23	93	25	The sentence: "Integrating coastal infrastructure such that it allows the shore-ward relocation of coastal ecosystems such as mangroves, seagrasses and salt marsh will be important as will be maintaining sediment supply to coastal areas in order to enable mangroves can keep pace with sea level rise" is vague and needs rewriting. Which coastal infrastructure is to be integrated? integrated with what? what is the meaning of 'allows'? what is the meaning of 'shore-ward relocation of coastal ecosystems'? who is going to relocate? what is the meaning of relocate? seagrasses, salt marsh and mangroves are completely different ecosystems and it is not clear how one ecosystem will 'enable' to 'keep pace' of another ecosystem. [Baruch RINKEVICH, Israel]	Accepted and revised
6756	93	25	93	25	enable mangroves can keep pace' should be 'enable mangroves to keep pace' [Robert Shapiro, United States of America]	Rejected - sentence is ok
216	93	26	93	35	The whole paragraph suffers from two faults: 1. each sentence stands by itself withiout a connecting rationale; 2. each of the sentences is vague, containing unclear phrases. [Baruch RINKEVICH, Israel]	Accepted and revised
47088	93	27	93	29	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted. Text was revised.
634	93	29	93	30	Similarly, wetlands management should recognise the importance of these ecosystems in maintaining water quality and storing C. It should be emphasised that like glaciers in many areas, wetlands are the main providers of clean water for human consumption. [Maria Jesus Iglesias Briones, Spain]	Accepted and text modified
8166	93	30	93	30	And in communities(Arkema [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
1456	93	31		34	Stick to the impacts. Sentence can be dropped. [Karen Olsen, Denmark]	This section is intended to discuss adaptation in a broad perspective (as per the plenary approved outline)

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6272	93	31		34	Stick to the impacts. Sentence can be dropped. [Anne Olhoff, Denmark]	This section is intended to discuss adaptation in a broad perspective (as per the plenary approved outline)
8168	93	32	93	32	And in general.Adaptation [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
636	93	37	95	9	I have already stated before that a section on soil biodiversity and soil foodwebs is missing from the terrestrial ecosystems section. And when talking about coral reef loss perhaps you should mention McClenachan et al 2017 Science Advances 06 Sep 2017, Vol. 3, no. 9, e1603155. [Maria Jesus Iglesias Briones, Spain]	Accepted and considered
21538	93	37	93	37	Maybe add " and food security" to the title? To make the link with impacts on human beings [Nathalie HILMI, France]	Rejected - title was not modified. There is a subsection and box dealing with food security
17722	93	38	93	41	For readability, some modefication of the sentence is necessary as follows. "These vast interconnected systems ultimately commence with trapping solar energy by phytoplankton through photosynthesis. Eventually, the predator-prey interactions mediate the energy flow to higher trophic level such as sharks, marine mammals and humans." [Republic of Korea]	Accepted - text has been revised
6758	93	39	93	39	drivesolar' should be 'drive solar' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
8170	93	39	93	39	Space: drivesolar [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
10844	93	39	93	39	Change to 'ultimately drive solar energy trapped…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
35166	93	39	93	39	The spacing is missing between the words "drivesolar" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
44498	93	39	93	49	Spacing issue in 3 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
6760	93	40	93	40	eventually that apex predators' should be 'eventually the apex predators' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
60472	93	42	94	43	Drawing conclusions from four examples is problematic from a scientific perspective. If no broader literature review is available, a lack of sufficient information to draw broad conclusions should be stated. [United States of America]	The special reports are explicitly not comprehensive reasons of space and overlap with the main reports. Consequently, providing key examples which may not be inclusive of all possibilities, is the accepted modus operandi. Is recommended that the reader go back to AR5 for some of these broader perspectives.
8164	93	45	93	45	And also in rise(Lovelock [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
16306	93	47	93	49	see: Roberts, D., W. R. Howard, A. D. Moy, J. L. Roberts, T. W. Trull, S. G. Bray, and R. R. Hopcroft (2011), Interannual pteropod variability in sediment traps deployed above and below the aragonite saturation horizon in the Sub-Antarctic Southern Ocean, Polar Biology, 34(11), 1739-1750, doi:10.1007/s00300-011-1024-z [Australia]	Accepted and considered
8172	93	48	93	48	Space: survive(Bednaršek [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
17536	93	48	93	48	Replace "is" with "are". [David Schoeman, Australia]	Accepted - text has been revised
6762	93	49	93	49	isnow' should be 'is now' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
8174	93	49	93	49	Space: isnow [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
10846	93	49	93	49	Change to 'dissolution is now 19-26% higher, for…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
34110	93	49	94	1	Please consider to reformulate to make the sentence more understandable [Norway]	Accepted and text modified
6764	94	5	94	5	thatunderpin' should be 'that underpin' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
8176	94	5	94	5	Space: thatunderpin [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10848	94	5	94	5	Change to 'filter-feeding molluscs that underpin the basis of…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
22066	94	5		40	Please review these lines and correct spaces between words (e.g. lines 5, 13, 17, 28, 39) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
44500	94	5	94	39	Spacing issue in 4 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
8178	94	13	94	13	Space: exposure(Lemasson et al. [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
19286	94	13	94	13	delete after exposure [Spain]	Accepted and text reorganised
1458	94	17			What about the Arctic and other parts of the ocean? I thought krill occurs worldwide. [Karen Olsen, Denmark]	Accepted: Krill are found in all the world's oceans.
5330	94	17	94	17	Would add in that krill are also a vital food source for whales and seabirds in temperate oceans as well thus any decline in their abundance will have global impacts. [Brendon Dunphy, New Zealand]	Accepted and text modified
6274	94	17			What about the Arctic and other parts of the ocean? I thought krill occurs worldwide. [Anne Olhoff, Denmark]	Accepted: Krill are found in all the world's oceans.
6766	94	17	94	17	thereby represents is amajor link' should be 'thereby is a major link' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
8180	94	17	94	17	is amajor should be "a major" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10850	94	17	94	17	Change to 'represents is a major link between primary…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
18372	94	17			What about the Arctic and other parts of the ocean? [Andrea TILCHE, Belgium]	Accepted
22068	94	17			Remove "is" in "thereby represents is a major" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
16308	94	20	94	21	Note that the impacts section on “Ocean food webs” refers to “sea ice loss in the Antarctic”, while the section on “Global and regional climate changes” is not concerned about Antarctic sea ice. Please amend. [Australia]	Two sections that are referred to here have different focuses. The first to be mentioned is the " global and regional climate change" concentrates on the global and regional climate changes and associated hazards. It specifically doesn't discuss the biology or the impacts of physical and chemical changes in the Antarctic on natural and human systems. The second, however, focuses on the observed impacts and protective risks in natural and human systems. This is the appropriate place to discuss her role or impact of climate change on criminal and associated food webs.
16310	94	20	94	20	To be consistent with the hyphenation of sea ice in this chapter change “Sea ice loss” to read “Sea-ice loss”. [Australia]	Editorial - copyedit to be completed prior to publication
46758	94	22	94	22	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted: Appropriate edits made.
8182	94	23	94	23	Delete the period after "key roles" [Ismael Nunez-Riboni, Germany]	Editorial - copyedit to be completed prior to publication
22070	94	23			Remove dot in "roles." [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
8184	94	28	94	28	Insert a space in "finfishhave" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
10852	94	28	94	28	Change to 'change to finfish have strengthened…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
16312	94	28			Given severe degradation of reef habitats (occuring and risk of worsening) climate change induced habitat loss is a serious indirect risk to reef dependent and reef associated species that should also be mentioned. [Australia]	Accepted and text modified

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17724	94	28	94	32	This sentence is composed of sentences that are difficult for policy makers to understand becasuse they are not sufficiently expressing what the author intended. Therefore, it is necessary to revise the text so as to improve the readability of sentence. [Republic of Korea]	Accepted: text has been rewritten and integrated into a more logical narrative.
40312	94	28	94	28	finfishhave -----> "fin" "fish" "have" [Amal Hussein, Egypt]	Not applicable - This text was deleted
62942	94	28		30	Research by Mycoo and Mycoo and Donovan (2017) underscore the the role of integrated coastal zone planning and management and coral reefs and ecosystem nased adaptation as cost-effective measures. See: Mycoo, M. and Donovan, M. G. (2017). Blue Urban Agenda: Adapting to Climate Change in the Coastal Cities of Caribbean and Pacific Small Island Developing States. Inter-American Development Bank, Washington. D.C, USA. Mycoo, M. (2014). Sustainable Tourism, Climate Change and Sea Level Rise Adaptation Policies: Barbados. Natural Resources Forum. Vol.38, Issue 1, 47-57. Sustainable tourism, climate change and sea level rise adaptation policies in Barbados [Michelle Mycoo, Trinidad and Tobago]	Accepted and text modified
6768	94	34	94	34	areshifting' should be 'are shifting' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
8186	94	34	94	34	And in "areshifting" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
10854	94	34	94	34	Change to 'species are shifting to higher latitudes,…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
35168	94	34	94	34	The spacing is missing between the words "areshifting" [Shaukat Ali, Pakistan]	Not applicable - This text was deleted
40314	94	34	94	34	areshifting -----> "are" "shifting" [Amal Hussein, Egypt]	Not applicable - This text was deleted
41412	94	34	94	43	Can confidence levels be defined for each of the findings/ [Lourdes Tibig, Philippines]	Accepted: section has been rewritten and has proved the use of calibrated confidence and likelihood language.
8188	94	39	94	39	And in "warming(Notz" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
19288	94	46	94	46	increase in 1.5, not increase to 1.5 [Spain]	Accepted. Text was revised.
17538	94	47	94	47	Replace "where" with "for which". [David Schoeman, Australia]	Not applicable - This section was rewritten
19290	94	49	94	49	warming instead of temperatures [Spain]	Accepted: have retained the use of temperature but now added " above the Preindustrial period"
17540	95	2	95	3	Do the "surface temperatures" here refer to air or sea-surface? Not clear, but the differences are huge… [David Schoeman, Australia]	It refers to Global Mean Surface Temperature (GSMT)
6770	95	3	95	3	temperatures achieve by 2°C' should be 'temperatures reach 2°C' [Robert Shapiro, United States of America]	Not applicable - text has been revised
16314	95	3			Given above, wouldn't 'high risks' for finfish kick in well below 2degC? [Australia]	Accepted: text modified to: 'Risks accumulate at higher temperatures for bivalve molluscs, with high risks of impacts at 1.2°C, and very high risks at 1.8°C or more. This general pattern continues with low latitude fin fish acquiring high risks of impact (medium agreement, medium evidence) when average global surface temperatures achieve by 1.3oC°C above the pre-industrial period, and very high risks at 1.8oC (Figure 3.19).' Note that we have checked the text references to the burning ember diagrams.
22072	95	3			Remove one empty space preceding "As" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
6772	95	4	95	4	ecosystemscale' should be 'ecosystem scale' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
6774	95	4	95	4	focus onthe management' should be 'focus on the management' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
8190	95	4	95	4	And in "ecosystemscale" and in "onthe" (both in the same line) [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10856	95	4	95	4	Change to 'with impacts at the ecosystem scale, most adaptation options focus onthe management of..' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
22074	95	4		46	Please review and correct spaces between words (e.g. lines 4, 17, 18, 19, 35, 44, 45) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
40316	95	4	95	4	ecosystemscale -----> "ecosystem" "scale" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
44502	95	4	95	45	Spacing issue in 7 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
6776	95	6	95	6	this important food web components' should be 'these important food web components' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
16316	95	7			Suggest add a comment on the importance of maintaining higher population levels of fished species to provide more resilient stocks in the face of climate change and ocean changes. This is recognised in the Queensland Sustainable Fisheries Strategy 2017-2027 available from https://www.daf.qld.gov.au/fisheries/sustainable-fisheries-strategy. They say " Larger fish stocks allow fish populations and their environments to be more resilient to adverse environmental factors such as climate change and habitat degradation. The Strategy also sets a target to build stocks up to a target of 60 per cent of the original unfished population (or maximum economic yield) by 2027 that maximises commercial profitability, the quality of fishing, and stock resilience over time." [Australia]	Accepted: have added reference to this approach to fisheries management under environmental variability plus references to the peer-reviewed literature.
218	95	12	97	2	Section: 3.4.4.2.3 Key ecosystem services (e.g. carbon uptake, coastal protection, and coral reef recreation)- missing the discussion on 'proteins' which is a key ecosystem service at least important as the listed key ecosystem services. [Baruch RINKEVICH, Israel]	Accepted: special report is not meant to be comprehensive. This section is focused on a specific discussion of representative natural and human processes - in this case, carbon uptake, coastal protection, and coral reef recreation
16318	95	12	96	49	Suggest discussion of how ecosystem services would be different under 1.5 vs. 2 C. [Australia]	Accepted: the focus the discussion much more on 1.5 and 2°C in terms of impacts at each level relative to today.
60474	95	12	96	16	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted: have worked on text to make it more relevant to 1.5°C and 2°C. Have also inserted assessment language for agreement and the amount of evidence which tends to be limited in these cases.
1460	95	13			The first sentence makes no sense here because the paragraph does not mention ecosystem services (although the processes mentioned underpin ecosystem services) [Karen Olsen, Denmark]	Accepted: the word ecosystem has been removed … the listed processes are 'services' that the ocean provides.
6276	95	13			The first sentence makes no sense here because the paragraph does not mention ecosystem services (although the processes mentioned underpin ecosystem services) [Anne Olhoff, Denmark]	Accepted: the word ecosystem has been removed … the listed processes are 'services' that the ocean provides.
18374	95	13			The first sentence makes little sense here because the paragraph does not mention ecosystem services (although the processes mentioned underpin ecosystem services) [Andrea TILCHE, Belgium]	Accepted: the word ecosystem has been removed … the listed processes are 'services' that the ocean provides.
7876	95	15			… processes which are influenced by ocean chemistry, circulation, oceanography, temperature, and biochemical components. Please re-phrase. I suggest replacing "oceanography, temperature" by "thermohaline structure". [Petr Zavialov, Russian Federation]	Rejected - text is clear
8192	95	17	95	17	And in "use.Recent" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit

Comment No	From Page	From Line	To Page	To Line	Comment	Response
8194	95	18	95	18	And in "decreasing(Iida" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
8196	95	19	95	19	And in "circulation(Rahmstorf" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
54200	95	23	95	24	The last sentence of this paragraph is either incomplete or useless. [Jordi Salat, Spain]	Accepted: sentence removed.
60476	95	23	95	24	This sentence suggests that complex changes in warming and stratification had been discussed previously, but that is not the case. [United States of America]	Accepted: sentence removed.
1462	95	26			Coasal protection is not necessarily an ecosystem service because it could be provided through infrastructure. Change the argument. [Karen Olsen, Denmark]	Accepted: have rewritten taken care not to use 'ecosystem service' incorrectly.
1464	95	26		36	Condense the paragraph to the absolute minimum: 1 sentence. [Karen Olsen, Denmark]	Accepted: have significantly reduce the length of this paragraph in line with the request here.
6278	95	26			Coasal protection is not necessarily an ecosystem service because it could be provided through infrastructure. Change the argument. [Anne Olhoff, Denmark]	Accepted: have rewritten taken care not to use 'ecosystem service' incorrectly.
6280	95	26		36	Condense the paragraph to the absolute minimum: 1 sentence. [Anne Olhoff, Denmark]	Accepted: have significantly reduce the length of this paragraph in line with the request here.
18376	95	26		36	we reccomend to condense the paragraph to the absolute minimum: 1 sentence. [Andrea TILCHE, Belgium]	Accepted: have significantly reduce the length of this paragraph in line with the request here.
34112	95	28	95	30	Please consider to add "tropical" before "coral" in the beginning of the sentence. The issue concerns only the tropical coral reefs. [Norway]	Accepted: were tropical has been inserted in front of a number of references to coral reefs.
54202	95	33	95	36	In my opiniom, the last sentence of this paragraph is more clear than the sentence used in the SPM chapter (see the next row of the sheet) [Jordi Salat, Spain]	Accepted
8198	95	35	95	35	And in "expensive(Temmerman" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
19292	95	35	95	35	add natural adaptation is limited and after where [Spain]	Accepted: Recognizing and restoring coastal ecosystems in general may be more cost-effective than human remedies such as the installation of seawalls and coastal hardening, where natural adaptation is limited and the costs of creating and maintaining structures is generally expensive (Temmerman et al., 2013).
1466	95	38		47	Be concise and focus on the difference in impacts between 1.5 and 2 [Karen Olsen, Denmark]	Accepted: text significantly rewritten to focus more on 1.5 and 2°C
6282	95	38		47	Be concise and focus on the difference in impacts between 1.5 and 2 [Anne Olhoff, Denmark]	Accepted: text significantly rewritten to focus more on 1.5 and 2°C
18378	95	38		47	need to be concise and focus on the difference in impacts between 1.5 and 2 [Andrea TILCHE, Belgium]	Accepted: text significantly rewritten to focus more on 1.5 and 2°C
6778	95	40	95	40	rising seasand intensifying' should be 'rising seas and intensifying' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
7616	95	40	95	40	...rising seas and.. [Jens Zinke, Germany]	Not applicable - This text was deleted
9788	95	41	95	42	If you cite studies that look into high emission SLR responses and impacts, you should also cite Garner et al. 2017 PNAS on NYC flood hazards in 2300. Please try to cite studies that also use strong mitigation scenarios. [Alexander Nauels, Australia]	Section 3.3 and the section on coasts and low-lying areas and SLR focuses on these particular issues.
17542	95	42	95	42	Awkward wording in paretheses, revise [David Schoeman, Australia]	Not applicable - This text was deleted
8200	95	44	95	44	And in "2016)have" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
8202	95	45	95	45	And in "mitigation(Rosenzweig" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
62944	96	2		3	Mycoo (2017) can be cited. Mycoo, M.A. (2017). The 1.5°C tipping point: Vulnerabilities and Adaptation Strategies for Caribbean Small Island Developing States. Regional Environmental Change. Doi:org/10.1007/s10113-017-1248-8 [Michelle Mycoo, Trinidad and Tobago]	Accepted
10532	96	3	96	3	“small island developing states (SIDS)” has been first defined on P15 L7. Besides, “, SIDS)” should be “, (SIDS)” on P15 L7. [Hong Yang, Switzerland]	Not applicable - text has been revised
6780	96	4	96	4	increasingglobal temperatures' should be 'increasing global temperatures' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7618	96	4	96	4	...increasing global temperatures… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8204	96	4	96	4	And in "increasingglobal" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10858	96	4	96	4	Change to 'between increasing global temperatures,…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
44504	96	4	96	9	Spacing issue in 2 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
17544	96	7	96	7	Replace "on-line" with "online". [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
1468	96	9		19	This is too detailed and at the same time too generic in the description of impacts. Cut or reduce to 1 sentence [Karen Olsen, Denmark]	Accepted: have shortened section considerably and have made it much more specific.
6284	96	9		19	This is too detailed and at the same time too generic in the description of impacts. Cut or reduce to 1 sentence [Anne Olhoff, Denmark]	Accepted: have shortened section considerably and have made it much more specific.
6782	96	9	96	9	concernover' should be 'concern over' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
8206	96	9	96	9	And "concernover" [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
10860	96	9	96	9	Change to 'has prompted concern over the relationship…' [Franklin Paredes, Brazil]	Not applicable - This text was deleted
16320	96	9	96	19	The recent assessment of the impacts of climate change on World Heritage reefs may be a useful citation here: Heron SF et al (2017) Impacts of Climate Change on World Heritage Coral Reefs: A First Global Scientific Assessment. Paris, UNESCO World Heritage Centre. [Australia]	Interesting study but not extensively peer-reviewed
18380	96	9		19	This is too detailed and at the same time too generic in the description of impacts. Cut or reduce to 1 sentence [Andrea TILCHE, Belgium]	Accepted: have shortened section considerably and have made it much more specific.
22076	96	10		41	Please review and correct spaces between words (e.g. lines 10, 37, 41) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
41612	96	11			Change "$36 billion (USD)" to "36 billion USD" [Czech Republic]	Not applicable - This text was deleted
16322	96	12	96	14	Make it clear that these figures refer to the Great Barrier Reef. [Australia]	Not applicable - This text was deleted
41614	96	13			Change "$6.4 billion AUD" to "6.4 billion AUD" [Czech Republic]	Not applicable - This text was deleted
6784	96	15	96	15	through' should be 'as' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
8208	96	15	96	15	through such aspects through changing weather patterns, should be " through such aspects by changing weather patterns"? [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
17546	96	15	96	15	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This text was deleted
17548	96	16	96	16	Delete "recent" [David Schoeman, Australia]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16324	96	21	96	26	Are these risks really only moderate risk at 1.5DegC? [Australia]	Our understanding of how the risks and hazards are likely to involve is relatively uncertain as our abilities to adapt to the changes that occur. Therefore the risks are moderate at 1.5°C. At 2°C the there is a higher probability of return events and one can fairly certainly say that say high degree of risk at 2°C or more.
320	96	27	96	33	I would suggest to add active reef restoration as another emerged adaptive strategy. An example manuscript: Rinkevich B. (2015) Climate change and active reef restoration—Ways of constructing the 'reefs of tomorrow'. Journal of Marine Science and Engineering 3, 111-127. [Baruch RINKEVICH, Israel]	Accepted: references added.
1470	96	28		37	Focus on impacts. Paragraph could be deleted [Karen Olsen, Denmark]	According to the accepted outline, adaptation is a key component of this section. The previous section focused on observed impacts.
6286	96	28		37	Focus on impacts. Paragraph could be deleted [Anne Olhoff, Denmark]	According to the accepted outline, adaptation is a key component of this section. The previous section focused on observed impacts.
6786	96	36	96	36	involving a naturally' should be 'involving naturally' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
8210	96	37	96	37	Insert a space in "ecosystems(Cooper" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
44506	96	37	96	46	Spacing issue in 3 places [Rita Man Sze Yu, China]	Accepted - Text was revised with the suggested edit
221	96	39	96	45	The whole section is vague with terms that are not clear and the different sentences are not connected to each other. It is not clear what is discussed here. Revise. [Baruch RINKEVICH, Israel]	Accepted: Has been rewritten to be clearer.
60478	96	39	97	2	While this outlines adaptation options (part of the section heading), it does not do so in the scope of 1.5°C or specific temperature scenarios. [United States of America]	Text and discussion has been modified to have more specific discussions of 1.5oC and 2°C
219	96	40	96	41	Not clear what is the meaning of: "ensuring that coastal ecosystems are able to undergo shifts in their distribution and abundance". which shifts? What is the meaning of 'shifta'? Why a coastal protection tends to ensure shifts? I understand that coastal protection tries to protect and is not a tool for promoting any shift. Revise the sentence. [Baruch RINKEVICH, Israel]	This is referring to the previous discussion of the fact that ecosystems are likely to shift in distribution e.g. mangroves and seagrass beds. There is a need to make sure that they have the ability to shift without being prevented from doing so by human infrastructure in coastal areas adjacent to whether changes are occurring. In the context of the preceding discussion, this makes sense. Some elements have been rewritten.
220	96	41	96	41	The term used (Facilitating these changes) is not clear and the sentence is not connected earlier sentence. Which changes? [Baruch RINKEVICH, Israel]	Again, this has been explained in the previous text. Facilitating may mean building coastal infrastructure to accommodate the migration of mangroves in the landward fashion as sea level rises.
6788	96	41	96	41	thesechanges' should be 'these changes' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7620	96	41	96	41	..Facilitating these changes… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8212	96	41	96	41	And in "thesechanges" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
10862	96	41	96	41	Change to 'Facilitating these changes will require…' [Franklin Paredes, Brazil]	Accepted - Text was revised with the suggested edit
35170	96	41	96	41	The spacing is missing between the words "thechanges" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
40318	96	41	96	41	thesechanges -------> "these" "changes" [Amal Hussein, Egypt]	Accepted - Text was revised with the suggested edit
222	96	46	97	2	This section is not coinnected to the above section. It is started with "Adaptation options for coral reef recreation" while the section above is on coastal protection. Also, the 4 types of adaptation options are not typically 'adapttaion'. Missing other measures such as ctive reef restoration. [Baruch RINKEVICH, Israel]	Accepted: have made a distinction regarding 'service' versus 'ecosystem service'.
8214	96	46	96	46	And in "structures(Cooper" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
17550	96	46	96	49	Inconsistent capitalisation of list items [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
1472	97				Nice figure [Karen Olsen, Denmark]	Accepted
6288	97				Nice figure [Anne Olhoff, Denmark]	Accepted
16326	97		97		Indicate on Figure 3.19 B a line at ~1degC (present day). As mentioned above, review transitions in bar for corals in this figure too to match updated Gattuso assessment. [Australia]	Accepted: corrected.
61896	97	1	97	24	What is the purpose of this figure and how is it related to the focus of this report (1.5°C)? I do not find it relevant. [Valérie Masson-Delmotte, France]	The original figure in SO D was placeholder. We have continued the assessment and use burning member diagrams to summarise the expert assessment of risk relative to the increase in average global temperature above the preindustrial period. It is very relevant to the chapter which is focused on risk and adaptation options.
16328	97	3	97	22	Suggest remove this graphic if it cannot be modifed to focus on 1.5C versus 2C scenarios. As presented it is not relevant to this report. [Australia]	The SOD figure was a placeholder. It is being redrawn to specifically testify the risks at levels relative to this report - that is, 1°C, 1.5°C, 2°C or more. We are only using parts B and C of this diagram (and not A)
19294	97	3	97	22	include global mean temperature in Figure 3,19 [Spain]	The figure was a placeholder. Full intended and hence part A is not going to be used
32542	97	3	97	6	This is a great graphic! Please make it full-size as it is hard to read in this size. [Rosanne Martyr-Koller, Germany]	Thanks. Figure has been revised
46906	97	3	97	22	Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Accepted: we are not including or intending to use part A which has the green and red colours in it.
54206	97	3	97	22	This figure and its caption are exactly the same as in Gattuso et al. (2015). Although it is already referenced, in the last sentence of the caption, it appears as "modified from" instead of "extracted from". Note in addition that in this last sentence the reader is referred to a "material and methods" out of context here. [Jordi Salat, Spain]	Figure and caption have been revised
60480	97	3	97	3	Text in figures is too small to read. [United States of America]	Thanks. Figure has been revised
61894	97	3	97	24	The figure is a copy and paste from Gattuso et al 2015. What has been modified is not clear. Please make sure that the basline reference periods are coherent with the choices explained in chapter 1 and that consistent units are used (e.g. GtCO2, not GtC in this report, see chapter 2). [Valérie Masson-Delmotte, France]	Accepted: we use the figure from Gattuso et al. 2015 as a placeholder. We have really assessed the literature 2015 to 2018 - and have made modifications to the consensus reached by Gattuso. The text has a full explanation of this, plus extensive online material.
6790	97	13	97	13	belowthe horizontal axis, whereas the' should be 'below the horizontal axis, where the' [Robert Shapiro, United States of America]	Figure and caption have been revised
8216	97	13	97	13	And in "belowthe"… [Ismael Nunez-Riboni, Germany]	Editorial - copyedit to be completed prior to publication
22078	97	13			insert space between "belowthe" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32544	97	15	97	16	1000 GtC This unit makes scientific sense but is not intuitive. Please provide a more "human-scaled" comprison to help make more sense of this metric.E.g. barrels of oil? [Rosanne Martyr-Koller, Germany]	Not applicable - text has been revised
8218	97	22	97	22	And in "fromGattuso"… [Ismael Nunez-Riboni, Germany]	Editorial - copyedit to be completed prior to publication
1474	98				What is the purpose of this figure here? Maybe a revised version has space as a kind of framework illustration at the beginning of the report? [Karen Olsen, Denmark]	Accepted: we are not using part A of this diagram. The figure summarising our are updated assessment since AR5 is explained extensively in the text and will only built on parts B and C of the figure - both of which are highly relevant to the discussion of this section and chapter..
6290	98				What is the purpose of this figure here? Maybe a revised version has space as a kind of framework illustration at the beginning of the report? [Anne Olhoff, Denmark]	Accepted: we are not using part A of this diagram. The figure summarising our are updated assessment since AR5 is explained extensively in the text and will only built on parts B and C of the figure - both of which are highly relevant to the discussion of this section and chapter..
18382	98				What is the purpose of this figure here? Maybe a revised version has space as a kind of framework illustration at the beginning of the report? [Andrea TILCHE, Belgium]	Accepted: we are not using part A of this diagram. The figure summarising our are updated assessment since AR5 is explained extensively in the text and will only built on parts B and C of the figure - both of which are highly relevant to the discussion of this section and chapter..
46908	98		98		Figure 3:20. Nice summarising figure, could a more general version of this be used in one of the Ch3 FAQs? [Sarah Connors, France]	Accepted: excellent idea.
54208	98		98	8	Similar problems as in the previous figure and caption. For instance, the expression "see the main text" is out of context here. In addition, what is the meaning of the last sentence "To be developed further from Gattuso et al. (2015)"? There is also a typo "bodl" for "bold" [Jordi Salat, Spain]	Figure and caption have been removed
223	98	1	98	10	Figure 3.20- this fig should be revised.Each one of the 4 clusters present list of actions that need to be thoughts. For example: The protect cluster includes the action of 'develop MPAs networks". While more marine protected areas and more networks are positive actions, more and more studies discuss the inefficiency of MPAs to combat global change impacts and that protected areas fall far short of comprehensive or even adequate conservation objectives. Examples: Côté, I. M., Darling, E. S.(2010. Rethinking ecosystem resilience in the face of climate change. PLoS biology, 8(7), e1000438.? Selig, E. R., Casey, K. S., Bruno, J. F. 2012. Temperature?driven coral decline: the role of marine protected areas. Global Change Biology, 18(5), 1561-1570.? De Santo, E. M. 2013. Missing marine protected area (MPA) targets: how the push for quantity over quality undermines sustainability and social justice. Journal of environmental management, 124, 137-146.? The action of "protect ecological refugia"is not clear. Why it differs from general protection? what is the actual action needed? In the repair cluster, the tool of "saaist evolution" (at this stage is only at the suggestion /experimental level, better fits the Adapt cluster. The "add alkaline material" tool is considered as non-realistic approach, suggest to re-consider it. In the "Adapt" cluster, the tool of "use ecosystems to protect assets" is not clear. Needs explanation/revision. Same with the two "relocate" tools. What is the difference between them? [Baruch RINKEVICH, Israel]	Accepted: we will take these suggestions on board.
224	98	1	98	10	In addition, with regards to the "Repair" cluster, please add the topic (tool) of "ecological engineering approaches" .For Sampled papers on coral reefs: Horoszowski-Fridman, B., Brêthes, J-C., Rahmani, N., Rinkevich, B. 2015. Marine silviculture: incorporating ecosystem engineering properties into reef restoration acts. Ecological Engineering 82, 201-213. Rinkevich, B. (2014). Rebuilding coral reefs: does active reef restoration lead to sustainable reefs? Current Opinion in Environmental Sustainability 7, 28–36. [Baruch RINKEVICH, Israel]	Accepted: we will take these suggestions on board.
638	98	1	98	10	Could you please provide a similar compiling figure like this one for terrestrial ecosystems? [Maria Jesus Iglesias Briones, Spain]	Accepted, we are contemplating making this into a more generic figure with respect to ecosystems.
32546	98	1	98	1	Add "Relocate assets" to the "Adapt" bubble. [Rosanne Martyr-Koller, Germany]	Figure and caption have been removed
60482	98	1	98	1	Not clear why this figure is located here. [United States of America]	Accepted. Figure 3.20 was deleted from the section. Figure 3.19 presents a summary of the risks of impacts from ocean warming
6792	98	3	98	3	For ech cluster' should be 'For each cluster' [Robert Shapiro, United States of America]	Not applicable - figure was deleted
10864	98	3	98	3	Change to 'For each cluster, a…' [Franklin Paredes, Brazil]	Figure and caption have been removed
17552	98	3	98	9	The figure caption is sloppily edited [David Schoeman, Australia]	Figure and caption have been removed
35172	98	3	98	8	2 in CO2 should be subscripted. The spelling of bold is written as bodl. [Shaukat Ali, Pakistan]	Figure and caption have been removed
6794	98	4	98	4	[CO2] at mis concentration' should be '[CO2]atm is concentration' [Robert Shapiro, United States of America]	Figure and caption have been removed
22080	98	4			[CO2] at mis? [LUIS VALDES, Spain]	Figure and caption have been removed
6796	98	5	98	5	pathaway' should be 'pathway' [Robert Shapiro, United States of America]	Figure and caption have been removed
10866	98	5	98	5	Change to 'The mitigation pathway leading…' [Franklin Paredes, Brazil]	Figure and caption have been removed
303	98	6	98	6	.....represented in bold, consistent..... [Paul Doyle, Canada]	Figure and caption have been removed
6798	98	6	98	6	is represented in bodl' should be 'is represented in bold' [Robert Shapiro, United States of America]	Figure and caption have been removed
8220	98	6	98	6	bodl should be "bold" [Ismael Nunez-Riboni, Germany]	Not applicable - figure was deleted
10868	98	6	98	6	Change to 'represented in bold, consistent…' [Franklin Paredes, Brazil]	Not applicable - figure was deleted
22082	98	6			bold instead of "bodl" [LUIS VALDES, Spain]	Not applicable - figure was deleted
32548	98	6	98	6	Change "bodl" to "bold" [Rosanne Martyr-Koller, Germany]	Not applicable - figure was deleted
22084	98	8			Remove "To be developed" [LUIS VALDES, Spain]	Figure and caption have been removed
54708	99				Table 3.2 summary figures shouldbe included instead of the empty table [Qudsia Zafar, Pakistan]	Accepted: tables have been produced B\but will be placed online As SOM.
1476	100		101		The box can probably be shortened by 30% [Karen Olsen, Denmark]	Accepted: text has been shortened by ~30% (was 1400 now 940)
6292	100		101		The box can probably be shortened by 30% [Anne Olhoff, Denmark]	Accepted: text has been shortened by ~30% (was 1400 now 940)
18384	100		101		The box can probably be shortened by one third [Andrea TILCHE, Belgium]	Accepted: text has been shortened by ~30% (was 1400 now 940)
16330	100		101		Additional material to consider Hughes et al 2018 Science paper cited above (on global bleaching frequency). Also, future increases in sea temperature of as little as 0.5 degrees Celsius from present are expected to lead to significant degradation of the Great Barrier Reef (Ainsworth et al. 2016). Ainsworth, T.D., et al. (2016) Climate change disables coral bleaching protection on the Great Barrier Reef. Science, 352: 338-342. [Australia]	Accepted: Reference has been added.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16332	100		101		Box 3.6 doesn't fully comment on whether reefs survive overshoot scenarios and to what extent they would be able to recover after stabilization at 1.5D or higher - suggest add specific discussion of this to box 3.6 and other parts of the report as relevant. [Australia]	Accepted: text now includes mention of overshoot
16334	100		101		Review wording and style of writing in box 3.6 to improve readability, flow and impact. [Australia]	Accepted - text has been revised
34782	100		100		The Box 3.6 does not include reference to coral reef repositories. There is evidence from Florida that coral nurseries can serve as repositories for genetic material that would have otherwise been completely lost after extreme temperature events (Schopmeyer et al., 2012). [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Have included.
34780	100		100		Box 3.6 should note that an estimated 500 million people are dependent on coral reefs for their food, livelihoods and coastal protection. See Wilkinson, C., Souter, D. (2008). Status of Caribbean coral reefs after bleaching and hurricanes in 2005. Global Coral Reef Monitoring Network, and Reef and Rainforest Research Centre, Townsville, 152 p. The Box should also note that around a quarter of the world's fish biodiversity is associated with coral reefs (see: https://coralreef.noaa.gov/aboutcorals/values/biodiversity/) This is important to note to quantify and provide an esimate of the scale of impacts from the loss of coral reefs. [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Both of these numbers are hard to verify with specific peer-reviewed literature. As a result, I believe it is safer to express the number of species as these to million, and to refer to millions of people along coastal areas being dependent on coastal ecosystem goods and services from ecosystems such as coral reefs.
22086	100	1		49	Please review the entire page and correct spaces between words (e.g., lines 5, 7, 9, 11, 16, 28, 31, 36, 43, 44, 48) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
39904	100	1	100	1	Delete "[START BOX 3.6 HERE]". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be completed prior to publication
41414	100	1	102	4	Very informative for non-experts reading and understanding [Lourdes Tibig, Philippines]	Accepted
61898	100	1	102	2	What was assessed in the AR5 and what is new here? Please be more explicit on new knowledge, buidling on references since the AR5 several cited here are quite earlier than the AR5, why? Harmonize the style with the rest of the report ("grim", "optimistic"). Be consistent : "the prospect for coral reefs is better in a 1.5°C world than in a 2°C world". I would not use "better" given the earlier parts of the assessment. I also suggest to avoid repetitions with earlier parts (move everything on corals here) and to also cover cold water corals (e.g. North Atlantic) where recent findings not captured in the AR5 have recently emerged. [Valérie Masson-Delmotte, France]	Accepted: removed emotive language, are concentrated on what's new in terms 1.5 and 2°C. Have eliminated Coral Reef material from other parts of the chapter - leaving material relevant to a dictation and other issues.
11152	100	3			Reef-builder corals occur, even though marginally, as well in temperate seas such as the Mediterranean and are importantly impacted by climate warming, i.e. Cladocora caespitosa, recently entlisted as endangered in the IUCN Redlist. There is a fair ammount of information on long-term warming impacts on this temperate reef-builder (e.g. papers by Rodolfo-Metalpa, Kruzic, Kersting, Jimenez). Additionally, these "marginal" or "relict" reefs are of great interest to study the adaptation potential of scleractinian reef-builders. Although their contribution to the global framework of coral reefs is small, their exceptionallity in terms of adaptation to temperate conditions and current vulnerability to climate change, are of great interest as they may provide information on the potential occurrence/absence of adaptative responses of scleractinian zooxanthellate reef-builders to different paces of environmental changes. Therefore, I propose to somehow mention these marginal reef-builders and the existing long-term evidences of their vulnerability to climate warming. [e.g. literature: Rodolfo-Metalpa R, Bianchi CN, Peirano A, Morri C (2005) Tissue necrosis and mortality of the temperate coral Cladocora caespitosa. Ital J Zool 72: 271-276.; Kersting DK, Bensoussan N, Linares C (2013) Long-term responses of the endemic reef-builder Cladocora caespitosa to Mediterranean warming. Plos ONE 8: e70820.; Kružic P, Lovrenc L, Mavric B, Rodic P (2014) Impact of bleaching on the coral Cladocora caespitosa in the eastern Adriatic Sea. Marine Ecology Progress Series 509: 193-202. Jiménez C, Hadjioannou L, Petrou A, Nikolaidis A, Evriviadou M, Lange MA (2014) Mortality of the scleractinian coral Cladocora caespitosa during a warming event in the Levantine Sea (Cyprus). Regional Environmental Change 16: 1963-1973.] [Diego Kurt Kersting, Germany]	Accepted: Have included sentenced and references to reef-building or symbiotic corals occurring at high latitudes
44508	100	3	102	2	Box 3.6 is very long, can it be shortened to 1.5-2 pages? [Rita Man Sze Yu, China]	Accepted: text has been shortened by ~30% (was 1400 now 940)
8222	100	5	100	5	*Delete spaces* (yes, delete!) in "30 °S" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
8224	100	6	100	6	Insert space in "people(Burke" [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
225	100	7	100	8	Shallow water tropical coral reefs are found down to depth of 150m- change to: usually no deeper than 100m [Baruch RINKEVICH, Israel]	Sentence is clear.
8226	100	7	100	7	And in "2016).Shallow " [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
24230	100	8	100	9	'150m" and "of2000" adjacency [Nazan AN, Turkey]	Editorial - copyedit to be completed prior to publication
7622	100	9	100	9	…depths of 2000 m… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8228	100	9	100	9	And in " more(Hoegh" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
53688	100	9	100	9	The word "of2000" should be corrected as "of 2000" [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Text was revised with the suggested edit
8230	100	11	100	11	And in "reefs(Hoegh" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
6800	100	13	100	13	and2ºC.' should be 'and 2ºC.' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7624	100	13	100	13	..and 2ºC…. [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8232	100	13	100	13	And in "and2oC" [Ismael Nunez-Riboni, Germany]	Accepted - Text was revised with the suggested edit
8234	100	16	101	31	Too many missing spaces! Please check this part for missing spaces between words… [Ismael Nunez-Riboni, Germany]	Not applicable - This section was rewritten
6802	100	23	100	23	habitat for large proportion' should be 'habitat for a large proportion' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
32550	100	25	100	25	Coral reefs also offer shoreline protective services.Please include this here in some detail. See e.g. Narayan et al. 2016. "The Effectiveness, Costs and Coastal Protection Benefits of Natural and Nature-based Defenses". Plos One 11(5): e0154735. https://doi.org/10.1371/journal.pone.0154735 [Rosanne Martyr-Koller, Germany]	Accepted: added.
16336	100	27	100	30	The 50% loss of hard coral cover on the Great Barrier Reef reported by De'ath et al (2012) was attributed primarily to tropical cyclones, Crown of Thorn Starfish and bleaching events and not to the 'local factors' of the previous sentence, though starfish outbreaks may be linked to increased nutrient levels [Australia]	Accepted: has been rewritten to make clearer. Storms now added to the list.
16338	100	27	100	31	The quality of coral reefs is also declining, as many reefs are degraded and may not function to the same extent as healthy reefs [Australia]	Accepted: Have sentence that well before death of corals – these same factors may have decreased the growth and reproduction and ability to of corals to reproduce (references)
17554	100	31	100	33	Is this 1ºC warming absolute or relative? In other words, is it a hard line at 1ºC warming above the 1985-1993 mean, or will it adjust upwards as the waters warm (and corals adapt)? [David Schoeman, Australia]	there is no evidence that the thermal threshold of 1°C above the 1985-1993 mean has shifted to an extent. There is little or unambiguous evidence of adaptation in the peer-reviewed literature.
16340	100	32	100	33	Make it clear how long (weeks) the 1degC being talked about is for. [Australia]	Accepted: have added ' over 4 - 6 weeks' to indicate the time period of exposure needed for bleaching eventuates.
16342	100	32	100	32	Suggest delete (1985-1993) - the time period is not relevant in this context [Australia]	Rejected - time period is used as reference

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16344	100	35	100	35	The impact that coral disease can have on coral abundance and/or coral assemblages is not well highlighted, particularly when it occurs in the absence of coral bleaching (warmer winter temperatures). [Australia]	Accepted: have added a sentence to highlight disease and other drivers of reef decline due to environmental exposure.
8236	100	36	100	36	Missing period after 2017) [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
16346	100	36	100	38	This sentence largely overlooks the role of thermal stress (and low oxygen levels in very shallow water) in acute death of fish and invertebrates, which may happen long before corals die from starvation or disease. Bleached corals also may not provide the necessary services that fish and invertebrates rely on (such as refuge from predation/aiding in camouflage/nutritious food source). These animals may start to decline in abundance at the onset of bleaching, not only after coral mortality. [Australia]	Accepted: text has been modified
16348	100	40	100	43	Cheal AJ et al (2017 The threat to coral reefs from more intense cyclones under climate change. Global Change Biology, doi:10.1111/gcb.13593) is relevant here. [Australia]	Accepted: Reference has been added.
41416	100	40	100	41	confidence level? [Lourdes Tibig, Philippines]	Confidence added.
6804	100	42	100	42	damagethe framework' should be 'damage the framework' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
7626	100	42	100	42	...can damage the.. [Jens Zinke, Germany]	Not applicable - This section was rewritten
10870	100	42	100	42	Change to 'that can damage the framework of…' [Franklin Paredes, Brazil]	Not applicable - This section was rewritten
7628	100	44	100	44	...et al., 2016). The impacts.. point after brackets [Jens Zinke, Germany]	Not applicable - This text was deleted
8238	100	44	100	44	Missing period after et al., 2016) [Ismael Nunez-Riboni, Germany]	Not applicable - This text was deleted
32552	100	44	100	44	Add a period and space after "et al 2016)" [Rosanne Martyr-Koller, Germany]	Not applicable - This text was deleted
6806	101	1	101	1	for recover is reduced' should be 'for recovery is reduced' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
7630	101	1	101	1	..steady contracton change to contraction [Jens Zinke, Germany]	Not applicable - This text was deleted
16350	101	1	101	40	It is not clear what we gain from keeping warming to 1.5 instead of 2C - retain a small (10%) population of corals rather than lossing them. - this is an important difference [Australia]	Accepted: have made this clearer. While no coral is essentially going to survive 2°C, there will be large areas of degraded still living coral reefs. These will be very important in terms of regeneration as the climate in the ocean stabilises.
17556	101	1	101	1	Replace "recover" with "recovery". [David Schoeman, Australia]	Not applicable - This text was deleted
22088	101	1		41	Please review and correct spaces between words (e.g. lines 2, 7, 8, 37, 41) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
46760	101	7	101	7	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted
16352	101	14	101	15	Hughes et al (2017) only reported on the 2016 bleaching on the Great Barrier Reef and not the back-to-back events. [Australia]	Accepted: reference modified to Hughes et al. 2018
7632	101	15	101	15	...become increasing detailed… change to increasingly [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
16354	101	18	101	21	On line 19, it is not correct to link "well below 2degC" with the "loss of 90% or reef-building corals because the 90% is predicted for the 1.5C scenario (in the reference already cited). Suggest instead saying "Even achieving emission reduction goals consistent with the most ambitious target in the Paris Agreement of 1.5C will result in ...." [Australia]	Accepted and text changed
17558	101	18	101	18	Missing terminal punctuation. [David Schoeman, Australia]	Editorial - copyedit to be completed prior to publication
46762	101	32	101	32	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted
7634	101	33	101	34	refuges are potentially overrated since recent examples show that subtropical coral reef areas also suffered severe losses due to extreme marine heat waves, an example is the 2011 marine heat wave that affceted coral reefs down to 28 degrees S at the Houtman Abrolhos islands off Western Australia (Zinke et al., 2018 Diversity and Distributions and previous papers by Moore et al. 2012 and others). Zinke et al. 2018 wrote: "The rate and magnitude of environmental change will ultimately determine the future of the tropical reefs and whether the higher latitude reefs provide some refuge from climate change. Reefs at high latitudes that have historically had little exposure to disturbances could be among the most susceptible to future climate change because climate impacts, including more intense cyclones (Kossin et al., 2014), penetrate further into subtropical reefs (Cacciapaglia & van Woesik, 2015; Hobday & Lough, 2011; van Hooidonk et al., 2013; van Woesik, Sakai, Ganase, & Loya, 2011). Conversely, functionally diverse corals at lower latitudes that are regularly exposed to some level of disturbance may be more resilient to ocean warming and environmental disturbances even as exposure to cyclones increases (Emanuel, 2006)." [Jens Zinke, Germany]	Accepted: there is some discussion over whether or not refuges are likely to play a role. However, there is a significant set of literature and modelling that reveals that within a particular geography there may be quite different rates of climate change. consequently, it is important to reflect this discussion and its implications. Probably a case of medium agreement and limited evidence, in terms of confidence.
6808	101	41	101	41	than that of a2ºCworld' should be 'than that of a 2ºC world' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
7636	101	41	101	41	...that of a2ºC world… [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
11154	101	41	101	41	of a2ºCworld, spacing typo [Diego Kurt Kersting, Germany]	Accepted - Text was revised with the suggested edit
16356	101	41	102	2	The following reference is relevant here when discussing the future for coral reefs: Hughes TP et al (2017) Coral reefs in the Anthropocene. Nature, 201:10.1038/nature22901 [Australia]	Accepted: reference added
17560	101	41	101	41	A 2ºC world" is quite different from a "2ºC warmer world" or a "+2ºC world". Use consistent language to avoid issues of interpretation. [David Schoeman, Australia]	Accepted and ambiguity reduced.
21540	101	41	101	49	And what about the entry of foreign currencies thanks to tourism activities (e.g. divers coming to visit the reefs)? [Nathalie HILMI, France]	The term likelihood is used in paragraph which relates to industries such as tourism, which inherently bring in foreign currency to support local communities.
16358	101	43	101	43	Why are the words "in the short term" included? Suggest these words are deleted, because it could occur for a long time (at least decades) and recovery is not guaranteed. [Australia]	Accepted: have removed the words 'in the short term'
22090	101	48		49	pre-empt? (do you mean "prevent" or "foresee"?) [LUIS VALDES, Spain]	Yes.
39906	102	4	102	4	Delete "[END BOX 3.6 HERE]". [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
39908	102	5	102	6	Consider deleting lines 5 and 6. [Hernan Edgardo Sala, Argentina]	Accepted - Text was revised with the suggested edit
576	102	8	103	15	There are multiple, not entirely consistent discussions of sea-level rise and coastal flooding in this chapter. Should be streamlined and made consistent. [Robert Koppu, United States of America]	Taken into account - sections have been revised / updated with new literature, but the focus kept on 1.5deg and 2.0deg.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35174	102	8	102	8	Following study is to be cited under the section: Rasmussen et al. (2018) studied a global network of tide gauges, to project changes due warming at 1.5 ?C, 2.0 ?C, and 2.5 ?C above pre-industrial levels and made use of long-term hourly tide gauge records and sea level rise projections to estimate the expected future Extreme sea level for the 21st and 22nd centuries. By 2100, under 1.5 ?C, 2.0 ?C, and 2.5 ?C warming global mean sea level is projected to rise 48 cm, 56cm and 58 cm respectively. By 2150, temperature stabilization of 1.5 ?C Vs 2?C saves the inundation of lands where about 5 million people live, including 60,000 individuals currently living in Small Island Developing States. [Shaukat Ali, Pakistan]	Noted. Tide gauges relevant to Section 3.3.9. Exposure already mentioned in chapter, focusing on 2100 to make it consistent with other literature. Rasmussen et al. (2018) reference is in SL section (3.3.9 and Table 3.1)
60484	102	10	102	32	The negative conclusions laid out in these introductory paragraphs does not reflect the uncertainty cited, especially in relation to 1.5°C vs higher temperature scenarios. They should be significantly revised or removed. [United States of America]	Taken into account - Section has been cut down and introduces the structure, rather than being an introductory summary.
49208	102	12	104	21	aa [Bill Hare, Germany]	Rejected - no comment
46036	102	16	102	17	There are no references. It should be considered that wetland degradation (see before) strongly reduces/eliminates their potential to adapt to sea level rise. [Tim Rixen, Germany]	Taken into account - Section has been cut down and introduces the structure, rather than being an introductory summary.
9790	102	23	102	26	This sentence is grammatically and factually wrong. There is a relationship between GMT change and SLR, but it is not simply linear. Please revise. [Alexander Nauels, Australia]	Taken into account - Not completely sure what this precisely refers to. Paragraph has been changed with shortening. Sentence regarding GMT and SLR changed / shortened.
17562	102	23	102	26	Awkward wording, revise [David Schoeman, Australia]	Accepted - Sentence was reworded to ensure clarity
22092	102	23		25	The sentence in brackets starts in line 23 and close in line 25, but there are two citations whcih have to be in brackets as well, so additinal brackets should be added at (Wong et al., 2014; Mengel et al., year). If year is not available then remove this reference. [LUIS VALDES, Spain]	Not applicable - This text was deleted
54210	102	23	102	32	Warning. This introduction paragraph and subsequent paragraphs deeply rely on several unpublished papers, just submitted, such as: Mengel et al, Brown et al a and b and Nicholls et al. This means that results of these papers have not still being reviewed and may be controverted. [Jordi Salat, Spain]	Rejected - Papers have now been published with no factual change in content
12894	102	25			The reference to Mengel et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
13880	102	25	102	25	Please check the rest of the documents where missing year on the Citations (especially this section) [Raden Dwi SUSANTO, United States of America]	Editorial - copyedit to be completed prior to publication
40320	102	25	102	30	the years in thereferences "Mengel et al.; Brown a et al.; Brown b et al.; Nicholls et al.; " were missed, please add the missed year [Amal Hussein, Egypt]	Accepted. Papers are now published
44510	102	25	102	25	Formatting issue and missing year "warming Wong et al. 2014; Mengel et al.)" [Rita Man Sze Yu, China]	Not applicable - This text was deleted
56008	102	25	102	26	This statement that there is no clear connection between SLR and temperature is not consistent with studies cited elsewhere and perhaps refers to 2100 alone? The difference lies in more than just the rate over time. [Pamela Pearson, United States of America]	Taken into account - Paragraph has been changed with shortening. Sentence regarding GMT and SLR changed / shortened and now more specifically refers to the commitment to SLR
6810	102	26	102	26	2ºCwill slow' sshould be '2ºC will slow' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
12896	102	26			There should be a space between "2°C" and "will" [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
22094	102	26			insert space between "2ºCwill" [LUIS VALDES, Spain]	See response to comment # 12896
44512	102	26	102	47	Spacing issue and missing year in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
9792	102	27	102	28	What change? Why 4.0degC, where does this number come from? This seems very arbitrary to me. [Alexander Nauels, Australia]	Accepted - it comes from Brown et al. as an example. Now clearer in text.
12898	102	28			The reference to Brown et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Still without publication year! Please change
12900	102	28			The reference to Brown b et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	See response to comment # 12898
12902	102	28			The reference to Nicholls et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Editorial - copyedit to be completed prior to publication
12904	102	28			…compared to 4.0°C… everywhere else it is listed as 4°C [Marie-Jeanne S. Royer, Canada]	Editorial - copyedit to be completed prior to publication
22096	102	28			insert space between "2ºC(Brown" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22098	102	28			add "year" in citations or delete these references (three cases in this line) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
9794	102	29	102	30	This is plain wrong. Unmitigated climate change will lead to at least 50 cm more GMSLR by the end of the 21st century which comes with dramatic differences in coastal adaptation requirements already in the 21st century. [Alexander Nauels, Australia]	Accepted in part - Paragraph has been changed / removed in shortening. New text regarding magnitude of rise added. Adaptation now has separate section, noting long-term adaptation.
12906	102	29			The reference to Brown et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	See response to comment # 12898
22100	102	29		30	add "year" in citations or delete these references (three cases in these two lines) [LUIS VALDES, Spain]	See response to comment # 22098
22736	102	29	102	29	will not be realized should be revised "will not be evident" or "will not be obvious". The phrase can make the readers feel that mitigation efforts may be useless. [Makoot Tamura, Japan]	Taken into account - Sentence has been removed in shortening.
5620	102	30	102	30	. (Brown a et al.; Nicholls et al.; Nicholls and Lowe, 2004). [Sandra CASSOTTA, Denmark]	unclear what this comment refers to
5622	102	30	102	30	. Missing years…and the last reference is old..2004…not more recent references? [Sandra CASSOTTA, Denmark]	Not applicable - This text was deleted
12908	102	30			The reference to Brown et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	See response to comment # 12898
12910	102	30			The reference to Nicholls et al et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	See response to comment # 12902
12012	102	39	103	1	This paragraph a bit opaque to non-expert - clarify what is meant by "land exposed" vs. submergence [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - additional explanation in brackets which reference adaptation
13950	102	39	102	49	Please only include 1-2 significant digits for such uncertain projections (area of sea level rise/loss of land) [Natalie MAHOWALD, United States of America]	Not applicable - This text was deleted
22102	102	39			insert space between "AR5(Wong" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
9796	102	40	102	44	Where do these numbers come from, which study, which model? What do they mean? Please put the area of exposed land into perspective and provide a reference. Otherwise remove! [Alexander Nauels, Australia]	Accepted - Reference was in the following sentence which has now been made clearer. Model name plus scenario reference added.
54212	102	40	102	44	Warning. Figures in this paragraph are not referenced but, according to Table S4 of Annex 3.1, they come from the unpublished papers mentioned in the previous row. In any case I suggest to cite the Appendix here as it has been done in the previous section 3.4.4.2 conecening the updates by Gattuso et al. [Jordi Salat, Spain]	Accepted - Reference was in the following sentence which has now been made clearer. Reference to Appendix added
19296	102	41	102	44	please add table [Spain]	Noted - Have referred to Appendix table.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
22106	102	41		43	1.5ºC= 574,000 km2 of land exposed; 2ºC= 575,000 km2 of land exposed. It is difficult to beloieve that 0.5ºC difference will result in only 1000 km2 of additional land exposed. [LUIS VALDES, Spain]	Noted - this is in 2050, when the difference in SLR is small (due to the commitment to SLR). In 2100 it is larger. See Table 3.3.
6812	102	43	102	43	2ºCstabilization scenario' should be '2ºC stabilization scenario' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
22104	102	43			insert space between "2ºCstabilization" [LUIS VALDES, Spain]	Not applicable - This text was deleted
12912	102	45			The reference to Brown et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	See response to comment # 12898
60486	102	48	102	49	The projected impacts listed do not delineate between different temperature scenarios, but are rather broad and all-encompassing. They do not fit within the scope of the report and should be removed. [United States of America]	Rejected - These were added by request of reviewers from FOD. There is no evidence at 1.5°C/2°C, but they will be impacted and deserve acknowledgement.
32554	102	49	103	1	Deltas/estuaries will also be impacted by freshwater projections and combined with sea-level rise, make impact projections more complicated. This should be acknowledged. [Rosanne Martyr-Koller, Germany]	Accepted - Excellent point, with cross cutting implications. Referred to in Deltas and Estuaries section (paragraph 2)
53696	102	49	102	49	One of the major issues of the coastal population living in the flat deltas like Bangladesh is increasing trends of salinity which adversely affect health, agriculture, ecosystems, bio-diversity, drinking water supply, freshwater fisheries, food security and livelihood [AKM SAIFUL ISLAM, Bangladesh]	Accepted - added fisheries and biodiversity
578	103	3	103	15	This is a bit of a misstatement of Rasmussen et al., who are explicitly using current population as an assessment of land area, while acknowledging migration and demographic change will happen (and thus do not claim to present numbers for the actual population effect). The level of precision also seems unwarranted. More generally, there is no synthesis provided here. [Robert Koppu, United States of America]	Accepted - numbers have been rounded. Two synthesis sentences added at start of paragraph.
1478	103	3		5	This statement could be made even more useful by saying: "up to 10 million more people" would be affected at 2°C compared to 1.5°C" [Karen Olsen, Denmark]	Accepted - sentence added
3664	103	3	103	7	What is the difference between the two sentences? Please make clear. In the first sentence, at 1.5°C in 2100, 32-69 million people could be exposed to flooding, while in the second sentence, 55-94 million people/year are at risk from flooding. Is it just a different study, i.e. Rasmussen and Nicholls respectively? [David Docquier, Belgium]	Accepted - words 'adaptation or protection at all' added when referring to exposure (Rasmussen et al. 2018). Reference to no upgrade to protection levels for Nicholls et al. (2018)
6294	103	3		5	This statement could be made even more useful by saying: "up to 10 million more people" would be affected at 2°C compared to 1.5°C" [Anne Olhoff, Denmark]	Accepted - sentence added
9798	103	3	103	4	These number seem to be way to precise given all the underlying uncertainties. Please explain and provide more details and caveats! [Alexander Nauels, Australia]	Accepted - now rounded to the nearest million, so caveats not required.
18386	103	3	103	5	difference in population affected not statistically significant? [Andrea TILCHE, Belgium]	Accepted - now rounded to the nearest million.
18388	103	3	103	15	The projections are all without adaptation options - any evidence of adaptation options and differences there may be between 1.5 and 2 scenarios? [Andrea TILCHE, Belgium]	Partially rejected - Adaptation has been included with Nicholls et al. (2018), Arnell et al (2016), Warren b et al. This has been made clearer.
18390	103	3		5	This statement could be made even more useful by saying: "up to 10 million more people" would be affected at 2°C compared to 1.5°C" [Andrea TILCHE, Belgium]	Accepted - sentence added
19298	103	3	103	8	please add table [Spain]	Noted - Have referred to Appendix table.
41418	103	3	103	15	This is very important for countries with large populations exposed to SLR. The references are incomplete. Are there no confidence levels indicated for the findings (e.g., of risks)? [Lourdes Tibig, Philippines]	Uncertainty now added
6814	103	4	103	4	at 2ºCin 2100' should be 'at 2ºC in 2100' [Robert Shapiro, United States of America]	See response to comment # 22108
22108	103	4			insert space between "2ºCin" [LUIS VALDES, Spain]	Not applicable - This text was deleted
24168	103	4	103	4	at 2?in ---> "at 2 ? in" [Mustafa Tufan Turp, Turkey]	See response to comment # 22108
24232	103	4	103	4	at 2oCin" adjacency [Nazan AN, Turkey]	See response to comment # 22108
44514	103	4	103	13	Spacing issue and missing year in numerous places [Rita Man Sze Yu, China]	See response to comment # 44512
22110	103	5		27	add "year" in citations or delete these references (lines 5, 7, 13, 27, 48) [LUIS VALDES, Spain]	Still many references without publication year! Please change
35176	103	5	103	5	The year of study is missing with citation Rasmussen et al. [Shaukat Ali, Pakistan]	Accepted - Reference was edited
40322	103	5	103	5	Rasmussen et al.) the year is missed [Amal Hussein, Egypt]	Accepted. Papers are now published
1480	103	6			Providing impact projections on people up to 2300 seems out of range because too many variables can change over such a large period of time. [Karen Olsen, Denmark]	Taken into account - Kept due to the importance of the commitment to SLR as this is where the true benefits of the commitment to SLR lie. See Appendix Table S4.
6296	103	6			Providing impact projections on people up to 2300 seems out of range because too many variables can change over such a large period of time. [Anne Olhoff, Denmark]	Taken into account - Kept due to the importance of the commitment to SLR as this is where the true benefits of the commitment to SLR lie. See Appendix Table S4.
18392	103	6	103	8	Does not make sense to project population exposed to 2300 given uncertainties. [Andrea TILCHE, Belgium]	Taken into account - Kept due to the importance of the commitment to SLR as this is where the true benefits of the commitment to SLR lie. See Appendix Table S4.
18394	103	6			Providing impact projections on people up to 2300 seems out of range because too many variables can change over such a large period of time. [Andrea TILCHE, Belgium]	Taken into account - Kept due to the importance of the commitment to SLR as this is where the true benefits of the commitment to SLR lie. See Appendix Table S4.
9800	103	10	103	12	You have to provide a reference for this statement, please! [Alexander Nauels, Australia]	Accepted - Hinkel et al. (2014) added. 10.1073/pnas.1222469111
22738	103	10	103	10	twentieth may be "twenty first" [Makoot Tamura, Japan]	Not applicable - This text was deleted
32556	103	10	103	12	Please provide a citation for the flood costs [Rosanne Martyr-Koller, Germany]	Accepted - Reference was added
1482	103	11			thousands of billions = trillions [Karen Olsen, Denmark]	Rejected
6298	103	11			thousands of billions = trillions [Anne Olhoff, Denmark]	Rejected
6816	103	11	103	11	cost thousands on billions of dollars' should be 'cost thousands or billions of dollars' [Robert Shapiro, United States of America]	Rejected
17564	103	11	103	11	Thousands OF billions…why not just say "trillions"? [David Schoeman, Australia]	See response to comment # 1482
18396	103	11			thousands of billions = trillions [Andrea TILCHE, Belgium]	Rejected
1484	103	12		15	Put this in the context of 1.5 vs 2 [Karen Olsen, Denmark]	Accepted - add context for Arnell et al. and Warren et al. reference
6300	103	12		15	Put this in the context of 1.5 vs 2 [Anne Olhoff, Denmark]	Accepted - add context for Arnell et al. and Warren et al. reference
18398	103	12		15	Put this in the context of 1.5 vs 2 [Andrea TILCHE, Belgium]	Accepted - add context for Arnell et al. and Warren et al. reference
12914	103	13			The reference to Warren b et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Still without publication year! Please change
53692	103	14	103	14	Bangladesh is also one of the flat-delta countries where large population also exposed to SLR. [AKM SAIFUL ISLAM, Bangladesh]	Accepted - Bangladesh added and sentence reworded
54214	103	14	103	14	There is a 1280 Pg C emission scenario among temperature rising scenarios context. Should it be converted? [Jordi Salat, Spain]	Accepted - context added.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
12918	103	18	103	31	Section 3.2.5.2.2 does not clearly indicate why cities are particularly at risk (e.g. number of cities located in low lying/coastal areas, growth of city populations (more than 50% of world population now live in cities) etc.). It is therefore very hard to understand from this section why cities are of particular concern for impacts of sea level rise. [Marie-Jeanne S. Royer, Canada]	Accepted - reference to Hallegatte expanded with quantification of risk.
44516	103	18	103	31	The Cities section is a bit weak. Highlight areas of hotspots? [Rita Man Sze Yu, China]	Taken into account - No relevant hotspot literature for mitigation scenarios / need to keep focus on 1.5°C and 2°C
304	103	19	103	19	.....are expected to experience increased flooding..... [Paul Doyle, Canada]	Accepted - Sentence was reworded to ensure clarity
6818	103	19	103	19	to result in increased flooding' should be 'to have increased flooding' [Robert Shapiro, United States of America]	See response to comment # 304
12916	103	19	103	21	The intended meaning of this sentence is difficult to understand. Urban areas are not projected to result in increased flooding, etc. They may be expected "to see" an increase in flooding. [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence reworded.
17566	103	19	103	19	Awkward wording, revise: w=how can cities "result in flooding"? [David Schoeman, Australia]	See response to comment # 304
19300	103	19	103	19	add Coastal before Urban [Spain]	Accepted - word added.
22744	103	19	103	21	It is not clear what you mean by "enhancement through localized subsisdence". [Marie-Jeanne S. Royer, Canada]	Accepted - Sentence reworded.
32558	103	19	103	20	Change "enhancement"to "enhanced" [Rosanne Martyr-Koller, Germany]	Rejected - text was modified
32560	103	19	103	20	Add "and surface water" after "salinization of groundwater" [Rosanne Martyr-Koller, Germany]	Rejected - text was modified
35954	103	19	103	25	May consider adding following reference - Mishra, V.*, A.R., Ganguly, B., Nljssen, and D.P. Lettenmaier, 2015: Changes in observed climate extremes in global urban areas. Environ. Res. Lett. 10 (2) 024005, doi:10.1088/1748-9326/10/2/024005 [India]	Rejected - paper does not mention coastal flooding or sea-level rise
60488	103	19	103	25	This information does not compare a 2°C temperature scenario against a 1.5°C scenario and should be revised or removed. [United States of America]	Noted - no city scale data exists on 1.5°C vs 2°C, but cities remain important. Have drawn on implications from wider literature
61900	103	19	103	31	move all diluted aspects related to cities in a common box. [Valérie Masson-Delmotte, France]	Noted - this cities section remains as it is SLR specific. However, a reference has been made to Cross Cutting Box 4.3
6820	103	20	103	20	may be enhancement through' should be 'may be further enhanced through' [Robert Shapiro, United States of America]	See response to comment # 32558
17568	103	21	103	21	Awkward wording, revise [David Schoeman, Australia]	Accepted - Sentence was revised
46764	103	21	103	21	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - confidence / uncertainty statements now updated throughout whole of this section
1486	103	23			2°C warming by 2040 cannot even be achieved with BAU. Focus [Karen Olsen, Denmark]	Rejected - this clearly states it is RCP8.5 and not a stabilisation scenario. Subsequent sentences notes implications of a stabilisation scenario. There is a lack of evidence for mitigation scenarios specifically for cities.
6302	103	23			2°C warming by 2040 cannot even be achieved with BAU. Focus [Anne Olhoff, Denmark]	Rejected - this clearly states it is RCP8.5 and not a stabilisation scenario. Subsequent sentences notes implications of a stabilisation scenario. There is a lack of evidence for mitigation scenarios specifically for cities.
18400	103	23			2°C warming by 2040 cannot even be achieved with BAU. Focus [Andrea TILCHE, Belgium]	Rejected - this clearly states it is RCP8.5 and not a stabilisation scenario. Subsequent sentences notes implications of a stabilisation scenario. There is a lack of evidence for mitigation scenarios specifically for cities.
9802	103	24	103	24	The emission trajectory and corresponding SLR response for RCP8.5 in 2040 cannot be used as indicator of a long-term SLR response in a world where GMTs stay below 2degC. This statement is very misleading and should be either clarified or removed. [Alexander Nauels, Australia]	Taken into account - the contextual sentence clarifying this was already the next sentence.
1488	103	27		31	The message is clear: no difference between 1.5 and 2. Say it and nothing more [Karen Olsen, Denmark]	Taken into account - Sentence reworded and focused on 1.5°C and 2°C
6304	103	27		31	The message is clear: no difference between 1.5 and 2. Say it and nothing more [Anne Olhoff, Denmark]	Taken into account - Sentence reworded and focused on 1.5°C and 2°C
12088	103	27	103	31	This paragraph doesn't contain any arguments for why cities can financially justify adaptation like dikes and generally none of the sentences follow on from each other. It's not clear what argument the authors are trying to make - yes, dikes will have to be bigger with greater levels of sea-level rise, but what of it - cost? Impacts? More dikes? [United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the "financially justify" sentence has been removed. Paragraph has been totally reworded
12920	103	27	103	31	Very hard to understand what is meant by this paragraph. Obviously climate change mitigation is advantageous but this paragraph does not go very far in showing how and why and particularly why for cities. [Marie-Jeanne S. Royer, Canada]	Accepted / taken into account - reference to Hallegatte expanded with quantification of risk. However, there is limited literature for climate change mitigation at 1.5/2.0 deg for cities
17570	103	27	103	27	Insert "measures" between "adaptation" and "such" [David Schoeman, Australia]	Not applicable - This text was deleted
18402	103	27		31	The message is clear: no difference between 1.5 and 2. Say it and nothing more [Andrea TILCHE, Belgium]	Taken into account - Sentence reworded and focused on 1.5°C and 2°C
22746	103	27	103	31	Is dike building really the only strong mitigation option available (as is implied in this paragraph) since this is contradicted in the following section? [Marie-Jeanne S. Royer, Canada]	Accepted - There are other adaptation options and this is now acknowledged
31068	103	27	103	27	cities in the developing countries may not be able to financially justify such adaptation. And it is unclear what "financially justify" means. Focusing on whether cities can afford such measures would be more informative. It is informative for example, that most cities are not currently investing in adaptation in response to coastal risks of climate change (see Araos et al 2016 in Env Science and Policy - this study focused on 401 cities >1m people with a focus on what is actually being undertaken). [James FORD, Canada]	Accepted - the "financially justify" sentence has been removed. Reference to Araos et al. 2016 was added.
32562	103	27	103	27	What does this sentence have to do with the subsequent sentences? [Rosanne Martyr-Koller, Germany]	Accepted - sentence has been removed.
44518	103	27	103	31	Spacing issue and missing year in 3 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
60490	103	27	103	27	This sentence may be removed because "financially justify" is unnecessary and does not provide a scientific benefit. [United States of America]	Accepted - the "financially justify" sentence has been removed.
18404	103	31	103	31	Does not make sense to project population exposed and height of sea walls to 2300 given the underlying uncertainties. [Andrea TILCHE, Belgium]	Taken into account - evidence reduced and more generalised
28366	103	31	103	31	Please delete the last sentence. It is redundant. [Germany]	Accepted - sentence deleted.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
60492	103	35	104	8	This compilation of anecdotal, location-specific examples does not justify the broad conclusions of this section and may be removed. [United States of America]	Rejected - Highly relevant examples are in this section, involving multiple deltas at 1.5°C/2°C. Observations also included. No global deltas study exists at 1.5°C/2°C. Have expanded section to portray this.
19302	103	36	103	36	add and aquifers after estuaries [Spain]	Accepted - word added.
32564	103	40	103	41	Move sentence "through modelling…" to subsequent paragraph. [Rosanne Martyr-Koller, Germany]	Not applicable - This section was rewritten
22740	103	47	104	8	The paragraph insists on the importance of soft infrastructure rahter than hard one. However, it ma be controversial. In p66 of FOD Chapter 3, there was the sentence "Ellison and Stoddart (1991) suggest that mangroves may be able to cope with up to 12 cm 35 of sea-level rise over a one hundred year timeframe provided the sufficient sediment exists". However, I wonder why it was deleted in SOD. "Mutliple protection" which can make use of both hard and soft infrasture according to types and levels of impacts may be more realsitc way under the conditions of severe adverse impacts in the coastal area. [Makoot Tamura, Japan]	Taken into account - Paragraph does not insist on soft infrastructure rather than hard. Wording changed to reflect dikes and nature based solutions are acceptable (last 2 sentences). Ellison and Stoddart (1991) reference deleted from SOD due to need to focus on 1.5°C/2°C
24234	103	48	103	48	(Brown b et al.). Missing reference year [Nazan AN, Turkey]	Accepted - Reference was edited
44520	103	48	104	8	Year is missing "(Brown b et al.)" [Rita Man Sze Yu, China]	See response to comment # 24234
46766	103	49	103	49	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - confidence / uncertainty statements now updated throughout whole of this section
44522	104	1	104	1	(RCP8.5, CNRM)(Zaman et al., 2017) [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
61902	104	1	104	8	Is the assessment for deltas considering coastal submersion risks linked to .e.g. heavy precipitation increase in S. Asia (first sections of this chapter) and sea level rise? I suggest to capture key conclusions for deltas at the level of the chapter executive summary, given the level of vulnerability and exposure (people, assets). [Valérie Masson-Delmotte, France]	Accepted - Extreme water levels explained with Brown et al. reference (sea-level + surges, tides, bathymetry and local river flows). Deltas are mentioned in the Executive Summary
22112	104	3			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	See response to comment # 24234
22114	104	8			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	See response to comment # 24234
24236	104	8	104	8	(Brown b et al.). Missing reference year [Nazan AN, Turkey]	Accepted - Reference was edited
22122	104	9		43	Please review and correct spaces between words (e.g. lines 9, 14, 18, 19, 22, 23, 43) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
1490	104	11	105	1	There seems to be a lot of redundancy with information provided under low-lying areas: consider joining (but there is so much redundancy in the report altogehter that just by weeding that out could lead to substantial reduction in volume) [Karen Olsen, Denmark]	Taken into account - Agreed, there has been more cross referencing within the chapter and across the chapters. This section has been changed as a result.
1830	104	11	105	1	This section presents more an assessment of climate change impacts on small islands than an assessment of impacts under 1.5 oC (and 2 oC). More information should be given on the latter, otherwise the length of this section should be reduced. [Greece]	Taken into account - Agreed, but there are a limited number of journal articles on 1.5/2.0 degC for small islands, with many qualitative rather than quantitative. Section has been restructured and uses expert judgement. Generic assessment remains to capture issues important for small islands that would otherwise be missed.
6306	104	11	105	1	There seems to be a lot of redundancy with information provided under low-lying areas: consider joining (but there is so much redundancy in the report altogehter that just by weeding that out could lead to substantial reduction in volume) [Anne Olhoff, Denmark]	Taken into account - Agreed, there has been more cross referencing within the chapter and across the chapters. This section has been changed as a result.
16360	104	11	104	11	In discussing risks to small islands the following study is relevant: Taylor M et al (eds) 2016 Vulnerability of Pacific Island Agriculture and Forestry to Climate Change. Secretarita of the Pacific Community, Noumea, New Caledonia,554pp. [Australia]	Noted - No longer relevant to small islands section here as it focuses on sea-level rise. See response to comment 16362.
18406	104	11	105	1	While indeed small islands are recognised to be at risk, many if not all of the impacts mentioned (sea level rise, warming, precipitation, cyclons, salt intrusion…) also affect low-lying coastal areas. Broaden this section to also address their challenges. [Andrea TILCHE, Belgium]	Noted. This section has now been focused for SLR effects only. Other small island topics are covered in Box 3.5 and elsewhere.
18408	104	11	105	1	There seems to be a lot of redundancy with information provided under low-lying areas: consider joining (but there is so much redundancy in the report altogehter that just by weeding that out could lead to substantial reduction in volume) [Andrea TILCHE, Belgium]	Taken into account - Agreed, there has been more cross referencing within the chapter and across the chapters. This section has been changed as a result.
226	104	12	104	21	make space between attached words [Baruch RINKEVICH, Israel]	Editorial - copyedit to be completed prior to publication
9804	104	12	105	21	Sentences have to be checked grammatically. Last sentence: very colloquial statement on a very serious matter. Please rephrase! [Alexander Nauels, Australia]	Not applicable - This section was rewritten
17572	104	12	104	12	Awkward wording, revise [David Schoeman, Australia]	Accepted - Sentence was reworded to ensure clarity
22742	104	12	104	49	Fuji can be revised as "Fiji". [Makoot Tamura, Japan]	Accepted - Text was revised with the suggested edit
60494	104	12	104	28	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Rejected - There is a general lack of precise evidence at 1.5/2.0°C for small islands, but they are highly threatened and deserve acknowledgement qualitatively in the context of the wider literature. This section has been extensively revised.
61904	104	12	104	49	repetition with the box. The page reads like a review but not as an assesment. The style is also different and some aspects are not clear ("an approved understanding… is required") (does this mean : improved?); "projections for slow onset events" (the term is used by UNFCCC but not in IPCC reports). I suggest to strengthen the assessment here and merge with the box if relevant. The treatment of adaptation is very heterogeneous across sections of this chapter and harmonization would be appreciated, pending on literature. [Valérie Masson-Delmotte, France]	Taken into account / accepted - There is a general lack of precise evidence at 1.5/2.0°C for small islands. As sea-level rise is a major threat to small islands, this section has been kept but is now focused on the effects of sea-level rise only. Spelling mistake / unclear terms removed. There is now a clear adaptation section. Small island has observations adaptation as a special reference.
12922	104	13			The reference to Rasmussen et al. is missing the publication year. [Marie-Jeanne S. Royer, Canada]	Still without publication year! Please change
44524	104	13	104	44	Spacing issue and missing year in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
22116	104	15		44	Please review and correct spaces between words (e.g. lines 15, 16, 17, 18, 19, 23, 29, 43, 44) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
35956	104	16	104	16	…precipitation in 'Fuji'… Recheck if it is 'Fiji' [India]	Accepted - spelling mistake corrected
56700	104	16	104	16	Fiji is written as Fuji and there are no spaces after parenthetical reference)and [Cheryl Anderson, New Zealand]	Accepted - Text was revised with the suggested edit
56702	104	17	104	19	Several parenthetical references have no space either before or after. Also there is no space from the end of the sentence beginning of next: .Observations [Cheryl Anderson, New Zealand]	See response to comment #226
6822	104	18	104	18	modelsand other evidence indicatePacific' should be 'models and other evidence indicate Pacific' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
10872	104	18	104	18	Change to 'Observation, model sand other evidence indicate Pacific atolls have kept pace…' [Franklin Paredes, Brazil]	See response to comment # 6822

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43028	104	18	104	21	What is the limit at which adaptation becomes prohibitively expensive or technologically very difficult? Is this paragraph consistent with Box 3.7? Note Box 3.7, 3-111, L 16-19: "Rasmussen et al.project that for a 2.0?C stabilization scenario, a significant amount of the coastal areas occupied by SIDS inhabitants may be at risk of being permanently submerged by 2150, with gains to be had if stabilization is instead at 1.5?C. The study does not however account of shoreline response (see Section 3.4.2) or adaptation." [Durwood Zaelke, United States of America]	Accepted / noted - Section has been significantly revised. Consistency checked with SIDS box. Limits to adaptation covered in Section 3.4.5.7, last paragraph (good question). There is nothing specific for limits to adaptation in small islands in the literature.
46038	104	18	104	21	I suggest to consider the fate of coral reefs in this context as discussed before. [Tim Rixen, Germany]	Noted. Please see Section 3.4.4.12 and Box 3.4 and Box 3.5.
3666	104	23	104	32	This paragraph is not specific to small islands. Please consider removing. [David Docquier, Belgium]	Taken into account - these are small island references in a quantitative way. Section has undergone major edits to be more focused on SLR impacts.
56704	104	23	104	23	Same issue with run-on parenthetical reference [Cheryl Anderson, New Zealand]	See response to comment # 226
40324	104	24	104	24	Taylor et al.) the year is missed [Amal Hussein, Egypt]	Accepted - Papers are now published
1828	104	28	104	30	Statements as this one should be consistent with what is concluded in previous paragraphs (from where it emerges that there are sectors/areas where the difference of impacts between 1.5 oC and 2 oC is not significant or cannot be assessed yet due to lack of relevant data and projections). [Greece]	Accepted - Source reference was imprecise. Now removed. Sally Brown14.04.18
6824	104	29	104	29	2ºCregardless' should be '2ºC regardless' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10874	104	29	104	29	Change to '1.5°C and 2ºC regardless of timeframe)..' [Franklin Paredes, Brazil]	See response to comment # 6824
22118	104	32			remove a comma in "e.g.,," [LUIS VALDES, Spain]	Not applicable - This text was deleted
56706	104	32	104	32	(e.g.,, Pearce et al. 2017) needs correction with commas, and e.g. is not necessary here - (Pearce et al., 2017) [Cheryl Anderson, New Zealand]	See response to comment # 22118
17574	104	34	104	40	This whole paragraph needs careful editing. [David Schoeman, Australia]	Not applicable - This text was deleted
32566	104	34	104	36	Add "through" after "preparing to do so..." [Rosanne Martyr-Koller, Germany]	Not applicable - This text was deleted
56708	104	34	104	36	Sentence is written incorrectly should be …or are preparing to so internationally, as evidenced by land… [Cheryl Anderson, New Zealand]	Not applicable - This text was deleted
60496	104	34	104	49	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Rejected - There is a general lack of precise evidence at 1.5/2.0°C for small islands, but they are highly threatened and deserve acknowledgement qualitatively. This section has had extensive editing to bring more focus.
60498	104	34	104	40	This paragraph explicitly focuses on climate impacts on migration in small island developing states, but has missed a real opportunity to contextualize and nuance the discussion. Some suggestions: - It should be acknowledged that mobility has and always will be a part of many livelihoods of islanders, especially in the Pacific Islands (Farbotko, 2002; Farbotko and Lazarus, 2012) - Islanders have agency in dealing with the issue of migrating due to climate change. In fact, several governments are already implementing measures to proactively ensure adaptation – through both bilateral and regional labor migration schemes (see ""Immigration with dignity"" in Kiribati, McNamara, 2015) and planned relocation (see Sao Tome and Principe, Bettencourt, 2015). - This paragraph only talks about flooding as a potential driver of migration, but in fact drought is a potentially more influential one, as is seen, for example, in Papua New Guinea (Campbelle and Warrick, 2014) and the Marshall Islands (Burkett, van der Geest, and Fitzpatrick, 2017). - Likewise, sea level rise is a serious concern for most SIDs. Suzuki and Ishii (2011) find that level rise will be greater in the tropical Pacific than in any other area of the world, having knock on effects for a variety of islands. For example, sea level rise coupled with storm surges may make arable land less viable and underground fresh water supplies contaminated in Kiribati (Wyett, 2011). [United States of America]	Accepted, but causes of migration are discussed elsewhere is report, so the focus here has to remain on SLR. Now acknowledged that migration has always been important to islands, concerns about flooding. See section 3.4.10 for generic migration issues and 3.4.10.2. Some of the suggested references have been added., e.g. Farbotko and Lazarus, 2012, but others limited due to scope of 1.5deg report.
19304	104	35	104	35	sentence does not make sense [Spain]	See response to comment # 56708
22124	104	35			double bracket in 2013)) [LUIS VALDES, Spain]	unclear what this comment refers to
12924	104	37			has purchasing should be "has purchased" [Marie-Jeanne S. Royer, Canada]	Not applicable - This text was deleted
29714	104	37	104	38	Kiribati bought lands in Fidji but for agricultural purpose. Migrations will occur if situation gets worse. Infos on this issue are available on the Kiribati government's website http://www.climate.gov.ki/tag/fiji-islands/ (Comment by Guigone Camus) [Antoine PEBAYLE, France]	Taken into account - Due to space / need to focus on 1.5°C/2°C , section revised and only focuses on migration. Incorrect reference removed.
37168	104	37	104	38	Kiribati bought lands in Fidji but for agricultural purpose. Migrations will occur if situation gets worse. Infos on this issue are available on the Kiribati government's website http://www.climate.gov.ki/tag/fiji-islands/ [Françoise Gaill, France]	See comment 29714
56710	104	37	104	37	Kiribati has purchased (not has purchasing) [Cheryl Anderson, New Zealand]	See response to comment # 12924
18410	104	39	104	40	Indeed climate change impacts may be one of the many factors (push and pull) that determine the decision to migrate. This is an important aspect, that should be brought up at the beginning of the paragraph, and beyond the case of Maldives as it is much more general. [Andrea TILCHE, Belgium]	Accepted - new sentences added with more references. Have referenced Section 3.4.10 where migration is dealt with in detail which is better for this broad comment.
18412	104	42	105	1	This paragraph is general and based on limited evidence base. Moreover, many of the statements (e.g. an understanding of how aid is spent relating to adaptation) could apply much more broadly. In addition, there is a need for an understanding of how public and private funds (including but not limited to aid) is addressing adaptation requirements more broadly. Loss and damage needs to be understood in the context of the temperature scenario, but also of adaptation efforts. This needs to be specified in the paragraph. [Andrea TILCHE, Belgium]	Accepted - Paragraph now streamlined and greater references added. In some examples only generic evidence is in the literature, rather than 1.5 or 2.0deg specific. Chapter 5 deals with sustainable development, so a reference in this small island section has been made there. For loss and damage, see Cross Chapter Box 5.1
49964	104	42	104	49	This section includes proposed adaptations and the context on how to devise adaptation starting from climate change projections, impact assessment, utilization of local knowledge, and adaptation selection. If possible, the author can review Perdinan and Winkler (2014) published in Environmental Management proposed a summary to define adaptation options. [Perdinan Perdinan, Indonesia]	Taken into account - Read, but note cited as need to keep small island and 1.5°C/2°C focused
41420	104	43	104	46	aren't these policy-prescriptive? [Lourdes Tibig, Philippines]	Accepted - changed from 'need' to 'ideally could'
56712	104	43	104	43	priorities(Mycoo, 2017).Adaptation - need to have spaces around parentheses and before the start of the sentence. [Cheryl Anderson, New Zealand]	Not applicable - This text was deleted
56714	104	44	104	44	Same issue with run-on parenthetical reference that has no spaces, twice in this sentence. This should be checked in the whole sections as it occurs multiple times. On this page and on page 105. [Cheryl Anderson, New Zealand]	Noted / accepted - improved on final editing.
17576	104	46	104	46	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1832	104	47	104	48	The phrase "Today there are gaps in knowledge, finance and policies targeting loss and damage for small island developing States" is policy-prescriptive and its place is not in an IPCC Special Report. It can be changed to "Today there are gaps in knowledge on aspects such as residual damage, irreversible loss, and economic and non-economic losses caused by slow onset and extreme events" (this language was agreed by the IPCC Pleanry for the outline of AR6/ Chapter 1: Point of departure and key concepts), or it should be deleted. [Greece]	Accepted - sentence now changed with a stronger emphasis from the publication
1834	104	49	104	49	Same as in comment #75 for the sentence "There is a need to develop …., financial provision….". [Greece]	Accepted - sentence changed
41422	104	49	105	1	Policy-prescriptive [Lourdes Tibig, Philippines]	Accepted - sentence changed
31070	105	2	105	2	There is high confidence that adaptation to sea-level rise is occurring today - this really needs some references. And it is miselading - yes adaptation is occruing in some locations BUT research shows it is typically early stage adaptation and doesn't involve substantial investements in concrete actions to reduce vulnerability, and the effectiveness of such adaptation is rarely assessesd; it is also often limited to certain regions - see UN Adaptation GAP reports for example; Lesnikowski et al in Nature Climate Change; Magnan in Science; Ford et al 2015 in Reg Env Change; Araos et al 2016; work of Reckien, to name a few publications that would challenge thwe "high confidence" assertion [James FORD, Canada]	Accepted - Comments refers to p106, Line 2. Sentences added to reflect comments. Paragraph has been reworded. Space limitations mean discussion has to focus on 1.5/2.0 deg rather than generic examples. Reference made to Cross-cutting box 4.1.
640	105	4	105	28	There should be a mention to wind and water erosion threatening sandy beaches and sand dunes and hence, affecting cthe oastal topography and stability of these ecosystems. [Maria Jesus Iglesias Briones, Spain]	Taken into account - Covered in section now called 3.4.5.1.6 Impacts in other coastal settings
10534	105	4	105	4	The subheading “Ecosystems” is too general here, as this section is mainly focused on the coastal systems. [Hong Yang, Switzerland]	Accepted - Title changed to 'Wetlands'
22120	105	4			Although in the very beginning of this part 3.4.5.2.5. it says coral reefs, salt-marshes and mangroves, the reality is that it deals only with wetlands. Marine ecosystems are many and not only these few, so my suggestion is to change the title "Ecosystems" by "Tidal marshes" [LUIS VALDES, Spain]	Partially accepted - Opening sentence reworded to provide a better focus. Editorial decision to move corals to Sections 3.4.4.2.3 and 3.5.2.1.1 (in SOD), and the editing here was accidently missed. Title changed to 'Wetlands'
9806	105	4	105	45	So section 3.4.5 is supposed to cover obs and projections, is that correct? While 3.4.4 applies a different rational. As pointed out in the general comments above, I have to admit that I am left really confused with regards to which subsection covers which aspect of sea level and or coastal impacts. On lines 27 and 28 you refer to section 3.4.4 for further coastal ecosystem impacts. It's a constant back and forth, there is no structure which would allow to distinguish between observations and projections. Unfortunately, the whole sea level related coverage is really scattered and unclear. Please try to revise the section structure and compile the content more logically. [Alexander Nauels, Australia]	Noted. In the coastal impacts section, each subsection (excluding global studies and adaptation) deals with observations (physical and adaptation), then projections. This has now been made clearer. Sections have changed since SOD due to other comments.
34114	105	4	105	28	It seems mires are not included in 3.4.5.2.5 Ecosystems. Perhaps the types of wetlands that are discussed could be mentioned at the beginning. [Norway]	Partially accepted - Opening sentence more focused. Mires not apparent in literature specifically at 1.5°C/2°C.
227	105	5	105	25	Section: 3.4.5.2.5 Ecosystems. Missing discussion on Coral Reefs. One example: Brown, B. E., Dunne, R. P., Phongsuwan, N., Somerfield, P. J. (2011). Increased sea level promotes coral cover on shallow reef flats in the Andaman Sea, eastern Indian Ocean. Coral Reefs, 30(4), 867.Also: Buddemeier, R. W., Smith, S. V. (1988). Coral reef growth in an era of rapidly rising sea level: predictions and suggestions for long-term research. Coral Reefs, 7(1), 51-56.? There are also geological evidences that should be considered, for example:?Chappell, J., & Polach, H. (1991). Post-glacial sea-level rise from a coral record at Huon Peninsula, Papua New Guinea. Nature, 349(6305), 147-149.? Also: Montaggioni, L. F., Faure, G. (1997). Response of reef coral communities to sea?level rise: a Holocene model from Mauritius (Western Indian Ocean). Sedimentology, 44(6), 1053-1070.? [Baruch RINKEVICH, Israel]	Noted - Editorial decision to move coral reef section to Section 3.4.4. References have been made to coastal aspects together is ES and throughout. References have been passed to relevant sections.
228	105	5	105	25	same implies to mangroves. Few guiding references: Ellison, J. C., Stoddart, D. R. (1991). Mangrove ecosystem collapse during predicted sea-level rise: Holocene analogues and implications. Journal of Coastal research, 151-165; Nicholls, R. J., Hoozemans, F. M., Marchand, M. (1999). Increasing flood risk and wetland losses due to global sea-level rise: regional and global analyses. Global Environmental Change, 9, S69-S87; Gilman, E., Ellison, J., Coleman, R. (2007). Assessment of mangrove response to projected relative sea-level rise and recent historical reconstruction of shoreline position. Environmental monitoring and assessment, 124(1), 105-130; Ellison, A. M., Farnsworth, E. J. (1997). Simulated sea level change alters anatomy, physiology, growth, and reproduction of red mangrove (Rhizophora mangle L.). Oecologia, 112(4), 435-446.? [Baruch RINKEVICH, Israel]	Accepted / taken into account - Due to the need to focus on 1.5/2.0 deg, only the Ellison et al. (2013) reference has been added. Newer references indicate greater complexities or debate into wetland change that those suggested here.
44526	105	9	105	23	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial - copyedit to be completed prior to publication
56716	105	9	105	9	The sentence "(Raabe and Stumpf, 2016)analyzed" should be "Raabe and Stumpf (2016) analyzed" [Cheryl Anderson, New Zealand]	Not applicable - This text was deleted
41424	105	12	105	14	confidence levels? [Lourdes Tibig, Philippines]	Taken into account - Confidence levels have been added in as appropriate throughout the coastal impacts section.
56718	105	16	105	16	studies indicates should be "studies indicate" [Cheryl Anderson, New Zealand]	Not applicable - This section was rewritten
6826	105	17	105	17	2015with' should be '2015 with' [Robert Shapiro, United States of America]	Accepted - Punctuation was edited
10876	105	17	105	17	Change to 'sea-level rise (e.g., Cui et al. 2015 with a 2.6…' [Franklin Paredes, Brazil]	See response to comment # 6826
56720	105	17	105	23	Reference Cui et al., 2015 does not have end parentheses and runs into next word. Other references in the next lines have similar problems. [Cheryl Anderson, New Zealand]	Rejected- Parentheses do not run out but close on P105 L19
47282	105	18	105	18	Reference: Blankespoor 2014 is listed as 2014a in the reference list but only as 2014 here. [Sarah Connors, France]	Accepted - Reference was edited
46040	105	27	105	27	Wetlands were contextualized with sea level rise and carbon storage but they are also the largest natural emitter of CH4. The confluct is carboan strage versus CH4 emission. This aspect is missing here and CH4 is only shortly mentioned of page 170 line 23 - 28. [Tim Rixen, Germany]	Noted - this is out of scope for the impacts section of the report (as it is with other aspects of mitigation / emissions to do with coasts/adaptation). It is right that it is focused in other chapters.
44528	105	35	105	35	2013)) suggest that erosion [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
56722	105	35	105	35	double parentheses)) on that line, but general carelessness with spacing/parentheses in this whole section. [Cheryl Anderson, New Zealand]	See response to comment #44528
44530	105	41	105	44	Spacing issue in 3 places [Rita Man Sze Yu, China]	Not applicable - This section was rewritten
580	105	42	105	43	See also Rasmussen et al for amplification factors in 1.5°C vs 2.0°C world [Robert Koppu, United States of America]	Noted - Section removed with shortening as the focus is on systems. Mentioned in Section 3.5.4.9
1492	106				Consider deleting [Karen Olsen, Denmark]	Rejected - No explanation / line numbers or reason
6308	106				Consider deleting [Anne Olhoff, Denmark]	Rejected - No explanation / line numbers or reason

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1836	106	1	106	8	What is the purpose of this section (as it stands) in the SR1.5? It does refer to 1.5 oC or 2 oC b (apart from Box 3.7). [Greece]	Accepted / taken into account - There is lack of evidence at 1.5/2.0 deg, and this has been referred to in the appropriate coastal system sections in other parts of the report. Other wider forms of adaptation have been acknowledged.
18414	106	1	106	8	This section needs to be strenghthen. Migration and people movement are defintely not the only available/used response for sea level rise. Others include ecosystem based adaptation options (e.g. mangroves and wetlands restoration/protection) as well as traditional sea defence, to name just few. Please strengthen this section adequately, also comparing needs between 1.5 and 2 scenarios. [Andrea TILCHE, Belgium]	Accepted / taken into account - There is lack of evidence at 1.5/2.0 deg, and this has been referred to in the appropriate sections. Other wider forms of adaptation have been acknowledged. Reference added to Cross Cutting Box 4.1. Migration section now moved to Section 3.4.10.
3668	106	2			Rephrase: 'Adaptation to sea-level rise is occurring today'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
17578	106	2	106	2	The opening sentence seems strange. Do we really need to say that there is evidence that people are adapting to sea-level rise? The next sentence starts quite awkwardly, also [David Schoeman, Australia]	Accepted - Sentences were revised
22126	106	2			I do not think that this is well expressed "There is high confidence that adaptation to sea-level rise is occurring today" because this is vague. It will read better and be more sounding saying "There are many examples demonstrating that adaptation to sea-level rise is occurring today" and then list a few examples in brackets. [LUIS VALDES, Spain]	Taken into account - Suggested new text pin points it on sea-level rise, where as there are numerous (multiple) drivers for adaptation. Reworded sentence now reflects this.
1494	108		111		Reduce by >50% [Karen Olsen, Denmark]	The text has been shortened significantly
6310	108		111		Reduce by >50% [Anne Olhoff, Denmark]	The text has been shortened significantly
7208	108		111		The Box on SIDS is good but can be better aligned with adaptation in SIDS and development pathways in SIDS (Ch 4 and 5) without duplicating material. [Petra Tschakert, Australia]	The box focuses on changes to climate hazards and impacts. Due to space requirements, adaptation and development pathways are detailed in Chapters 4 and 5
16362	108	1	111	38	In discussing risks to small islands the following study is relevant: Taylor M et al (eds) 2016 Vulnerability of Pacific Island Agriculture and Forestry to Climate Change. Secretarita of the Pacific Community, Noumea, New Caledonia,554pp. [Australia]	The box focuses on peer reviewed literature that reviews changes to hazards and impacts at 1.5C
18416	108	1	112	5	Box 3.7: SIDS is a political grouping. Impacts will affect, ceteris paribus, equally all Low Lying Islands, Coasts and Communities. Morover, many of the elements here apply well beyond islands. Use broader denomination and tune the content of the box accordingly (also in line with SR on Oceans and the cryosphere). Alterantively (preferred option): consider removing the box and merging the content, with streamlining, with section 3.4.5.2.4 Small Islands (which should be renamed Small islands and low-lying coastal areas) [Andrea TILCHE, Belgium]	The box references literature that specifically focuses on SIDS. A definition of SIDS is provided in the glossary which highlights classification of areas as SIDS.
56764	108	1	111	39	Some of the impact work related to losses in GDP further affecting development are missing in this box. ADB (2013) and World Bank (2017) have documents reviewing these impacts for Pacific Islands: 1) Asian Development Bank. 2013. The economics of climate change in the Pacific. Mandaluyong City, Philippines: Asian Development Bank. 2) The World Bank. 2017. Climate and Disaster Resilience, Pacific Possible. http://pubdocs.worldbank.org/en/720371469614841726/PACIFIC-POSSIBLE-Climate.pdf [Cheryl Anderson, New Zealand]	The box focuses on peer reviewed literature that reviews changes to hazards and impacts at 1.5C
29718	108	3	112	3	Because of the lack of knowledge about the impact on the SIDS, shouldn't they be discussed in their own Special Report where new findings can be exposed. Maybe they can also be included in a chapter of the Ocean and Cryosphere Special Report? (Comment by Guigone Camus) [Antoine PEBAYLE, France]	The box focuses on reviewing knowledge for SIDS for this particular report.
32090	108	3	111	39	The interaction between climate drivers is not well addressed. For example, coral bleaching events, ocean acidification and loss of mangroves may interact to weaken reef systems even more than if these impacts occurred as single events. Are these interactions considered in the context of 1.5C evidence? There must also be discussion of the interaction between climate and non-climate drivers i.e. Impacts at different temperature thresholds must be set in the context of the full range of pressures already placed upon ocean and coastal systems. [Jamaica]	Reference to interactions between drivers has been added throughout the section on impacts on key human and natural systems, including for coral reefs and coastal inundation
36422	108	3	111	39	The interaction between climate drivers is not well addressed. For example, coral bleaching events, ocean acidification and loss of mangroves may interact to weaken reef systems even more than if these impacts occurred as single events. Are these interactions considered in the context of 1.5C evidence? There must also be discussion of the interaction between climate and non-climate drivers i.e. Impacts at different temperature thresholds must be set in the context of the full range of pressures already placed upon ocean and coastal systems. [Snaliah Mahal, Saint Lucia]	Reference to interactions between drivers has been added throughout the section on impacts on key human and natural systems, including for coral reefs and coastal inundation
37172	108	3	112	3	Because of the lack of knowledge about the impact on the SIDS, shouldn't they be discussed in their own Special Report where new findings can be exposed. Maybe they can also be included in a chapter of the Ocean and Cryosphere Special Report? [Françoise Gaill, France]	The box focuses on reviewing knowledge for SIDS for this particular report.
43202	108	3	112	3	SIDS are very important but this box is very long. Doesnt fit well with the flow of the text. Why not move some of this info into a SIDS section in 3.5.5? [Edward Byers, Austria]	The text has been shortened significantly
49210	108	3	111	39	General comment: The interaction between drivers is not well addressed in the box, for example coral bleaching events, ocean acidification and loss of mangroves may interact to weaken reef systems even more than if these impacts occurred as single events. This is also true for coastal inundation. Are these interactions considered in the context of 1.5C evidence? There should also be some acknowledgement of the interaction between climate and non-climate drivers i.e. Impacts at different temperature thresholds must be set in the context of the full range of pressures already placed upon the ocean and coastal systems upon which socio-economic systems and cultural values are SIDS are predominantly based. [Bill Hare, Germany]	Reference to interactions between drivers has been added throughout the section on impacts on key human and natural systems, including for coral reefs and coastal inundation
61906	108	4	111	20	The box is too long, repetitive with earlier parts of the chapter. I suggest to summarize the findings of AR5, be explicit on the assessment of new knowledge, uncertainties and knowledge gaps. The IPCC calibrated language is not used in this box (likely is used outside of the accepted use). The statement of ENSO is not backed up by the first part of the chapter. It should be extremely rigourous (what is the new state of knowledge on ENSO changes for 0.5°C more, post AR5) (in the core of the chapter, as it is not only relevant for SIDS but also for other places / sectors), or removed. [Valérie Masson-Delmotte, France]	The box has been shortened considerably and language related to confidence levels has been edited. The section on ENSO in the box has been revised
22128	108	5			Although with a different meaning, the word "state" is repeated twice in this first sentence. As "states" is part of the set of words "small island developing states", then the only option is to replace the first one. An alternative could be "1.5oC will likely prove a challenging disarray for small island developing states (SIDS)" [LUIS VALDES, Spain]	Rejected. The two uses of "state" have different meanings and are used in different contexts. There is no need to change the first usage of "state" to an alternative word
22130	108	5			I find this introductory paragraph redundant with part of the main text in this chapter. My recommendation is to reduce it as much as possible, for example by removing some sentences. Suggestions for removal: "which are already facing significant threats from climate change and other stressors" and "the compounding impacts from changes in rainfall and temperature patterns and frequency of extremes" [LUIS VALDES, Spain]	Accepted - The paragraph has been shortened

Comment No	From Page	From Line	To Page	To Line	Comment	Response
46768	108	5	108	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
60500	108	5	108	12	Provide references. [United States of America]	This is a summary paragraph of the contents of the box. References are all provided in the box.
46770	108	9	108	9	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
22132	108	11			The sentence "There are potential benefits to SIDS from avoided risks at 1.5oC versus 2.0oC, especially when coupled with adaptation efforts will carry significant benefits" could result in the false perception that a warming of 1.5º is a good thing. I think it is better (and closer to the proper message) to say that "1.5ºC will be much less damaging than that at 2ºC or more" [LUIS VALDES, Spain]	Accepted - The sentence has been revised to remove "potential benefits" and now states that there are a number of avoided risks at 1.5C versus 2C.
43222	108	14	108	20	Byers et al found that the number of exposed population to multi-sectoral climate impacts (across water / energy / land sectors) almost doubles between 1.5 to 2.0°C for the "Small Islands Regions / Caribbean and Central America / Mexico" regions (Supplementary information, Table section 4) (SSP2: 60 to 110mi). Furthermore, the vulnerable (with income <$10 / day) are even more exposed, with the the "exposed & vuilnerable" population tripling between 1.5 to 2.0°C (SSP2: 4 to 14 million) [Edward Byers, Austria]	Reference added to section on exposure of population and assets
60502	108	14	108	35	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	This section has been shortened significantly to summarize the information while still highlighting that SIDS are already experiencing impacts
32084	108	18	108	20	Individual events (e.g., tropical cyclones) may inflict damages exceeding double digit percentages in affected infrastructure, population and GDP. Suggestion to include more information for clarity. Percentages of what? e.g. what does x percentage of affected infrastructure refer to? [Jamaica]	This sentence has been edited for brevity and clarity. Now reads: "Extreme events (e.g. tropical cyclones) have also had severe financial implications for SIDS, in some cases damages have exceeded double digit percentages of GDP "
36416	108	18	108	20	Individual events (e.g., tropical cyclones) may inflict damages exceeding double digit percentages in affected infrastructure, population and GDP. Suggestion to include more information for clarity. Percentages of what? e.g. what does x percentage of affected infrastructure refer to? [Snaliah Mahal, Saint Lucia]	This sentence has been edited for brevity and clarity. Now reads: "Extreme events (e.g. tropical cyclones) have also had severe financial implications for SIDS, in some cases damages have exceeded double digit percentages of GDP "
38408	108	18	108	20	Individual events (e.g., tropical cyclones) may inflict damages exceeding double digit percentages in affected infrastructure, population and GDP. Suggestion to include more information for clarity. Percentages of what? e.g. what does x percentage of affected infrastructure refer to? [Grenada]	This sentence has been edited for brevity and clarity. Now reads: "Extreme events (e.g. tropical cyclones) have also had severe financial implications for SIDS, in some cases damages have exceeded double digit percentages of GDP "
49212	108	18	108	20	Individual events (e.g., tropical cyclones) may inflict damages exceeding double digit percentages in affected infrastructure, population and GDP suggest rephrasing for clarity. Percentages of what? e.g. what does x percentage of affected infrastructure refer to? [Bill Hare, Germany]	This sentence has been edited for brevity and clarity. Now reads: "Extreme events (e.g. tropical cyclones) have also had severe financial implications for SIDS, in some cases damages have exceeded double digit percentages of GDP "
62946	108	19		20	Mycoo (2017) can be cited. Mycoo, M.A. (2017). The 1.5°C tipping point: Vulnerabilities and Adaptation Strategies for Caribbean Small Island Developing States. Regional Environmental Change. Doi:org/10.1007/s10113-017-1248-8 [Michelle Mycoo, Trinidad and Tobago]	This sentence has been removed for brevity
46882	108	22	108	22	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
49214	108	23	108	23	Need to specify what about tropical cyclones? Increased intensity of tropical cyclones? [Bill Hare, Germany]	This sentence has been edited for brevity and 'tropical cyclones' is no longer included
56728	108	24	108	30	parentheses run into previous/next word without space - This problem is rampant throughout these pages. [Cheryl Anderson, New Zealand]	Editorial - copyedit to be completed prior to publication
29716	108	27	108	27	As an American State, Hawaii is not considered as a SIDS. (Comment by Guigone Camus) [Antoine PEBAYLE, France]	This sentence has been edited for brevity and 'Hawaii' is no longer included
32086	108	27	108	31	The reference to decline in corals is set within the context of observed climate change drivers. It would be useful to explicitly state whether this decline in corals is driven by climate change or by a range of interacting stressors. [Jamaica]	The sentence has been edited for brevity and clarified to reflect that decline in corals is associated with climate change impacts
36418	108	27	108	31	The reference to decline in corals is set within the context of observed climate change drivers. It would be useful to explicitly state whether this decline in corals is driven by climate change or by a range of interacting stressors. [Snaliah Mahal, Saint Lucia]	The sentence has been edited for brevity and clarified to reflect that decline in corals is associated with climate change impacts
37170	108	27	108	27	As an American State, Hawaii is not considered as a SIDS. [Françoise Gaill, France]	This sentence has been edited for brevity and 'Hawaii' is no longer included
49216	108	27	108	31	The reference to the decline in corals in set within the context of a paragraph highlighted observed climate change drivers. It would be useful to explicitly state this decline is driven by climate change or a range of interacting stressors. [Bill Hare, Germany]	The sentence has been edited for brevity and clarified to reflect that decline in corals is associated with climate change impacts
22134	108	31			A new sentence starts in this line by saying "44%". It is my understanding that a sentence can never be started by a number, it should be "forty-four percent …" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
56732	108	31	108	31	First numerical word in sentence should be written - Forty-four percent rather than 44% [Cheryl Anderson, New Zealand]	See response to comment #22134
62948	108	31			Mycoo, M. A (2018). Achieving SDG 6: water resources sustainability in Caribbean Small Island Developing States through improved water governance. Natural Resources Forum, 22(1), 54-68. [Michelle Mycoo, Trinidad and Tobago]	Reference added
17580	108	32	108	33	Awkward wording, revise [David Schoeman, Australia]	Not applicable - This text was deleted
22136	108	40			Accordingly to my comment about the double meaning of "state" and its duplication in the same sentence, and to be consistent, I recommend to replace the word "state" by "disarray" [LUIS VALDES, Spain]	Rejected. The two uses of "state" have different meanings and are used in different contexts. There is no need to change the first usage of "state" to "disarray"
46772	108	40	108	40	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
32088	108	43	108	43	Suggestion to clarify that "Mean surface temperature" is referring to terrestrial/land temp as in many cases SIDS total area is predominantly ocean (including EEZ) [Jamaica]	Mean surface temperature is further detailed in other sections of the chapter including 3.3.1.1 and also in chapter 1. For brevity we do not define mean surface temperature in this box
36420	108	43	108	43	Suggestion to clarify that "Mean surface temperature" is referring to terrestrial/land temp as in many cases SIDS total area is predominantly ocean (including EEZ) [Snaliah Mahal, Saint Lucia]	Mean surface temperature is further detailed in other sections of the chapter including 3.3.1.1 and also in chapter 1. For brevity we do not define mean surface temperature in this box
49218	108	43	108	43	It may be worth clarifying that the reference to "Mean surface temperature" is referring to terrestrial/land temp as in many cases SIDS total area is predominantly ocean (including EEZ) [Bill Hare, Germany]	Rejected. Due to space limitations we cannot provide the definition of mean surface temperature. This definition is provided elsewhere in the report, including in Chapter 1
22138	108	47			insert space between "1990)Wang" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
32568	108	48	109	3	Rehprase "threshold exceeding temperature extreme weather indices". It is cumbersome and unclear. [Rosanne Martyr-Koller, Germany]	Accepted - Sentence was reworded to ensure clarity

Comment No	From Page	From Line	To Page	To Line	Comment	Response
46774	108	48	108	48	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
22140	109	1		18	Please review and correct spaces between words (e.g. lines 1, 3, 8, 12, 15, 18) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
32092	109	5	109	15	In describing differences between SIDS, variations in precipitation are mentioned. However, there are also considerable variations in drought sensitivity between SIDS. (e.g. Atolls with no forests, river systems or groundwater storage can suffer drought if there is no rain for just a few weeks) [Jamaica]	Drought sensitivity has been added
36424	109	5	109	15	In describing differences between SIDS, variations in precipitation are mentioned. However, there are also considerable variations in drought sensitivity between SIDS. (e.g. Atolls with no forests, river systems or groundwater storage can suffer drought if there is no rain for just a few weeks) [Snaliah Mahal, Saint Lucia]	Drought sensitivity has been added
38432	109	5	109	15	In describing differences between SIDS, variations in precipitation are mentioned. However, there are also considerable variations in drought sensitivity between SIDS. (e.g. Atolls with no forests, river systems or groundwater storage can suffer drought if there is no rain for just a few weeks) [Grenada]	Drought sensitivity has been added
49220	109	5	109	15	In describing differences between SIDS variations in precip are mentioned however there are also considerable variations in drought sensitivity. (e.g.Atolls with no forests, river systems or groundwater storage can suffer drought if there is no rain for just a few weeks) [Bill Hare, Germany]	Drought sensitivity has been added
60504	109	5	109	8	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	This text is needed to demonstrate that impacts will not be the same across all SIDS
60506	109	9	109	11	Provide references. [United States of America]	Reference added
5624	109	15	109	15	1.5oC(Taylor et al.). ..should be 1.5oC (Taylor et al.). …and then add the year. [Sandra CASSOTTA, Denmark]	Accepted - Text was revised with the suggested edit
56736	109	20	109	20	sea levels should not be hyphenated [Cheryl Anderson, New Zealand]	Not applicable - This section was rewritten
56740	109	23	109	23	Nicholls et al. Needs a Year in the reference. [Cheryl Anderson, New Zealand]	Accepted - Reference was edited
582	109	30	109	32	Phrasing here is weird -- Rasmussen et al is distinguishing between scenarios reaching 1.5°C in 2100 and 2.0°C in 2100, not 1.5 vs 2.0°C in 2050 [Robert Koppu, United States of America]	Not applicable - This text was deleted
17582	109	34	109	36	Including appears twice in the sentence, making the sentence structure quite unwieldy [David Schoeman, Australia]	Accepted - Sentence was revised
41426	109	43	110	1	Extreme care must be exercised here as there is still low confidence in these projections [Lourdes Tibig, Philippines]	Accepted. Acknowledgement of uncertainties at the basin scale are included
60508	109	45	109	47	There is no need to reference a study that is not linked to 1.5°, and the reference may be removed. [United States of America]	removed
7638	109	49	109	49	...Ocean(Mavhungu et al.). There… public. Year missing [Jens Zinke, Germany]	Not applicable - This text was deleted
60510	110	1	110	2	If there are "insufficient studies to assess differences in tropical cyclone statistics for 1.5 vs 2°C," the preceding paragraph should begin with such a statement as a caveat, or remove the conclusions entirely, as they are not specific to 1.5 or 2°C scenarios. [United States of America]	The paragraph has a similar structure to other paragraphs in the box that begins with a discussion of studies on 1.5C and concludes with discussion of differences between 1.5C and 2C
7640	110	4	110	4	Indian Ocean SIDS will also be heavily impacted by projected ENSO changes, especially equatorial Indian Ocean countries (Seychelles, Chagos) where ENSO impacts are severe through mass bleaching and coral mortality (Sheppard et al., 2017, Atoll Research Bulletin, doi:10.5479/sl.0077-5630.613). [Jens Zinke, Germany]	Removed reference to only Pacific and Caribbean SIDS
16364	110	4	110	14	This discussion should also mention the risk of increased frequency of events where the South Pacific Convergence Zone moves to the equator (zonal SPCZ events), which have major impacts on many Pacific Island countries. See Cai et al. (2012) "More extreme swings of the South Pacific convergence zone due to greenhouse warming, Nature 488, pages 365–369. [Australia]	Accepted. Added
31000	110	4	110	14	These studies are nicely summarised but I think it would be worth adding a caveat along the lines that there are uncertainties in these findings due to systematic biases in models in the tropical Pacific e.g. a cold tongue that is universially too cold and extends too far westward in all mdoels. [Mat Collins, United Kingdom (of Great Britain and Northern Ireland)]	Text has been changed to refer to the specific section where these uncertainties are further discussed
41428	110	4	110	14	Are there confidence levels in the trends in frequencies of ENSO events? [Lourdes Tibig, Philippines]	Confidence levels have not been included in the box
22142	110	6		44	Please review and correct spaces between words (e.g. lines 6, 8, 44) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
46776	110	7	110	7	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
46778	110	12	110	12	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
17584	110	14	110	15	Why mention sea-level rise of 1 m. None of the IPCC projections suggest that this will happen anytime soon under either a 1.5 or 2ºC warming, as far as I know. Either contextualise with a timeframe or remove. [David Schoeman, Australia]	This comment does not correspond to actual text in the Box. There is no inclusion of 1m of sea level rise in the revised box.
56748	110	16	111		Line 48 on page 110 suggest there will be benefits to fisheries, yet the problems with fisheries are not included. "Reduced coastal fisheries productivity was expected to affect food security and local livelihoods" (Johnson, Bell, and DeYoung 2013, 11) There are more references on fisheries available that suggest impacts will be less beneficial. Since there is so much subsistence use of fisheries in the Pacific, this is important not to overlook. The FAO and SPC have published on adaptation and fisheries: Johnson, J. J. Bell, and C. De Young. 2013. Priority adaptations to climate change for Pacific Fisheries and Aquaculture: reducing risks and capitalizing on opportunities. Rome and Noumea, New Caledonia: FAO/Secretariat of the Pacific Community. [Cheryl Anderson, New Zealand]	Sentence was rewritten to reflect the challenges facing marine fisheries at warming of 1.5C
17586	110	17	110	17	The degree symbol is problematic [David Schoeman, Australia]	unclear what this comment refers to
17588	110	18	110	18	The degree symbol is problematic [David Schoeman, Australia]	unclear what this comment refers to
60512	110	24	110	37	If these scenarios account for zero adaptation, they should be described as such. [United States of America]	This has been added at the end of the box
22144	110	25		37	add "year" in citations or delete these references (four cases in lines 25, 27, 32, 37) [LUIS VALDES, Spain]	Accepted - References were edited
56744	110	25	110	25	Karnauskas et al. needs a Year in the reference. [Cheryl Anderson, New Zealand]	Not applicable - This text was deleted
7642	110	26	110	26	...The results of Karnauskas et al…. public. Year missing [Jens Zinke, Germany]	See response to comment #56744
46780	110	30	110	30	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
60514	110	39	110	42	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Not applicable - Text has been removed

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1496	111	3		26	Not specific to SIDS: remove [Karen Olsen, Denmark]	This section specifically cites references on SIDS and is therefore specific to SIDS and has been included. The section has been shortened.
6312	111	3		26	Not specific to SIDS: remove [Anne Olhoff, Denmark]	This section specifically cites references on SIDS and is therefore specific to SIDS and has been included. The section has been shortened.
18418	111	3		26	Not specific to SIDS: consider to remove [Andrea TILCHE, Belgium]	This section specifically cites references on SIDS and is therefore specific to SIDS and has been included. The section has been shortened.
22146	111	5		25	add "year" in citations or delete these references (six cases in lines 6, 7, 16, 22, 24, 25) [LUIS VALDES, Spain]	Accepted - References were edited
46782	111	5	111	5	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
35958	111	7			Year of the reference for "Rhiney et al." needs to be added [India]	Accepted - Year added
60516	111	7	111	9	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted. It has been removed
22148	111	14			insert spaces between "2015).Sea" [LUIS VALDES, Spain]	Not applicable - This text was deleted
6828	111	16	111	16	Rasmussen et al.project' should be 'Rasmussen et al. project' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
56752	111	16	111	16	Rasmussen et al. (DATE NEEDED) [insert space] project… [Cheryl Anderson, New Zealand]	See response to comment #6828
22150	111	17		18	please correct position of º in ºC [LUIS VALDES, Spain]	Accepted - Font was unified
6830	111	19	111	19	account of shoreline response' should be 'account for shoreline response' [Robert Shapiro, United States of America]	Accepted - Sentence was revised
56758	111	19	111	19	account of should be "account for" [Cheryl Anderson, New Zealand]	See response to comment #46758
29720	111	21	111	26	Traditional land tenure in SIDS is highly exposed to a risk of fragmentation - in many cases, redistribution of land is unthinkable for many local systems: before migration, severe conflits might occur as seen along history, in a context where climate change did not interfere (see Fiske et al., 2014). (Comment by Guigone Camus) [Antoine PEBAYLE, France]	Due to space restrictions, this issue of traditional land tenure in SIDS cannot be explored in the box. Migration and land tenure are discussed elsewhere in the report. See Cross-Chapter Box 3.1
37174	111	21	111	26	Traditional land tenure in SIDS is highly exposed to a risk of fragmentation - in many cases, redistribution of land is unthinkable for many local systems: before migration, severe conflits might occur as seen along history, in a context where climate change did not interfere (see Fiske et al., 2014). [Françoise Gaill, France]	Due to space restrictions, this issue of traditional land tenure in SIDS cannot be explored in the box. Migration and land tenure are discussed elsewhere in the report. See Cross-Chapter Box 3.2
12090	111	23	111	23	Loss and Damage has not been defined so it would be better to avoid its use here. Is this about capacity to monitor climate impacts? If so, could it be explicit and replace Loss and Damage with climate impacts. [United Kingdom (of Great Britain and Northern Ireland)]	This refers to a paper specifically on loss and damage. Loss and damage is also defined in Chapter 4 and in the Glossary
56760	111	24	111	24	Burgess et al. needs a YEAR [Cheryl Anderson, New Zealand]	Accepted - Reference was edited
29722	111	36	111	39	Adaptation in SIDS needs to be considered in the paradigm of sustainable development, it might also need to be considered in light of the diversity of the social systems in the SIDS (and they are multiple). Considering that some of the SIDS societies are not based on solidarity / care / share: adaptation might have to be thought as a cluster of various taylor-made adaptation systems, which means more time and more planification in advance (see Camus G., « Le cas de l'atoll de Tabiteuea, République de Kiribati », In : Bambridge T. et Latouche J.-P. (éd), Les atolls du Pacifique face au changement climatique : une comparaison Tuamotu-Kiribati, Paris, Karthala, pp. 121-173, 2016). (Comment by Guigone Camus) [Antoine PEBAYLE, France]	This is beyond the scope of this box that focuses on changes to hazards and impacts. Chapter 4 contains a box focused on adaptation in SIDS. Reference is made to this box as well s the need to consider sustainable development in adaptation
37176	111	36	111	39	Adaptation in SIDS needs to be considered in the paradigm of sustainable development, it might also need to be considered in light of the diversity of the social systems in the SIDS (and they are multiple). Considering that some of the SIDS societies are not based on solidarity / care / share: adaptation might have to be thought as a cluster of various taylor-made adaptation systems, which means more time and more planification in advance (see Camus G., « Le cas de l'atoll de Tabiteuea, République de Kiribati », In : Bambridge T. et Latouche J.-P. (éd), Les atolls du Pacifique face au changement climatique : une comparaison Tuamotu-Kiribati, Paris, Karthala, pp. 121-173, 2016). [Françoise Gaill, France]	This is beyond the scope of this box that focuses on changes to hazards and impacts. Chapter 4 contains a box focused on adaptation in SIDS. Reference is made to this box as well s the need to consider sustainable development in adaptation
46784	111	36	111	36	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Alternative wording has been used
47092	111	37	111	37	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted - Sentence was revised
32842	112		119		After finishing the related sections on 'crop production' and 'food security', I was left with the sense of having been presented many sets of results for specific factors that influence these topics in particular areas but not a real assessment of what the overall picture is in terms of either how the total numbers come out when all factors are included in various regions or well we understand the situation. For the latter, it seems not that well. An example is the sentence on p 118, lines 17-19 that concludes changes will be in the range of -30 to +45% (prices) by 2050. Is this reflective of our overall state of knowledge, that we can't even project the sign with confidence? A clearer assessment of what the take-away message from the results of all the individual studies presented in these two sections is would be very helpful. [Drew SHINDELL, United States of America]	We thank the reviewer for the suggestion. The text has been completely revised and many sentences were changed or deleted.
642	112	1	112	3	Box 3.7, Figure 1. Any reason why the northern hemisphere is totally missing here? It would be useful to see which values the Aridity Change Index take in these areas. [Maria Jesus Iglesias Briones, Spain]	This figure has been removed due to limited space
17590	112	3	112	3	This figure caption needs fleshing out [David Schoeman, Australia]	Not applicable - figure was deleted
35960	112	3			Year of the reference needs to be added in figure caption of Box 3.7 [India]	The figure has been removed due to space constraints
644	112	8	120	2	This section is very good but I miss two important aspects that should be mentioned here: (i) Global SOM decline: the continuos degradation of land across the globe is accelerating the loss of soil organic matter; the areas dedicated to cultivation are the ones suffering the most; the way this is counteracted is by adding huge amounts of fertilisers but it is unsustainable; (ii) using soil biodiversity to develop more sustainaible agricultural systems; for example, there has been a number of studies that hightlight the losses in macrofauna (earthworms) with intensive agriculture (reviewed by Briones & Schmidt 2017 Global Change Biolology 23:4396–4419) and it should be of great concern because they are the "nature's plough". [Maria Jesus Iglesias Briones, Spain]	We thank the reviewer for the suggestion. The text has been completely revised and many sentences were changed or delated. However, given constrains due to length of the text no all aspects can be treated. The report was mainly focused at reporting observed and expected impacts. Despite the reviewer suggestion was good, no so many analysis either related speculation are possible.
18420	112	8	112	8	Food security and food production systems should read Food "and nutrition" security and food production systems; a more comprehensive and inclusive definition in line with SDG 2 [Andrea TILCHE, Belgium]	Accepted- Modified as suggested

Comment No	From Page	From Line	To Page	To Line	Comment	Response
28368	112	8	119	39	The subsections in Chapter 3.4 do not have the same structure, which makes the reading partly difficult. It would be helpful for the reader to revise, e.g. in the following order: observed impacts, projections, differences between 1.5 and higher, restrictions (such as partly positive impacts). Please consider whether this is possible in the light of heterogeneity of content and methodology of the different sub-chapters. [Germany]	We thank the reviewer for the comment. The whole section has been revised and rewritten.
28370	112	8	119	39	The subchapter on food contains little evidence and few references specific to the 1.5°C world. It should be clarified that this is due to a lack of literature. Also, please consider the relevance of the body of evidence shown to the task of the SR1.5 (assessing the differential impact between 1.5 and 2°C), and shorten accordingly. [Germany]	The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box
49966	112	8	115	19	Food security may not only food supply, but also include distribution and access to food, can we change this section to food production as it only discusses food production. However, we can find in 3.4.6.5 p.118, so let the readers notice about this discussion in the bengining of 3.4.6) [Perdinan Perdinan, Indonesia]	We thank the reviewer for the comment. The section has been revised and rewritten.
60518	112	8	119	39	Section 3.4.6 would also benefit from an increased focus on how impacts under 1.5°C scenarios differ from 2°C scenarios and an inclusion of a clear indication of levels of confidence/uncertainties for statements throughout. [United States of America]	The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box
28372	112	10	112	15	Please delete this paragraph, since it gives only a very rough introduction and the subsequent sub-chapters are very detailed about observed changes. [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
476	112	11	112	13	In the end, it might be worth adding "particularly the autonomous adaptation implemented by farmers and other economic agents as responses to market signals (see, e.g. Wei, T., S. Glomsrød and T. Zhang (2017)." Wei, T., S. Glomsrød and T. Zhang (2017). "Extreme weather, food security and the capacity to adapt – the case of crops in China." Food Security 9(3): 523-535. DOI: 10.1007/s12571-015-0420-6) [Taoyuan Wei, Norway]	Reference added in the Cross Chapter Box (food security sub section has been deleted)
49632	112	11	112	15	The interplay of agricultural area demand/availability, yields, livestock systems and diets and climate change should be menioned more explicitly (see, e.g. for bioenergy-food security, Haberl et al., 2012 doi 10.1016/j.biombioe.2011.04.035). Ln 14. The sentence seems to be unfinished ("Crop" - what? Crop production, cropland yields, cropland variety, etc. etc. [Karlheinz ERB, Austria]	We thank the reviewer for the suggestion. The sentence has been completed and the text has been slightly revised. Despite the interaction among all agricultural systems is highly interesting, the formatting does not allow enough space for expliciting all these dynamics. Also, this interaction at 1.5-2°C increase is currently lacking in the whole current literature.
1498	112	14			... Whilst the degree of resilience is mainly dependent on geographical area and crop. I would strongly question that statement. [Karen Olsen, Denmark]	The word resilience has been replaced with the term compensation, as reported by Rose et al. (2016).
6314	112	14			... Whilst the degree of resilience is mainly dependent on geographical area and crop. I would strongly question that statement. [Anne Olhoff, Denmark]	The word resilience has been replaced with the term compensation, as reported by Rose et al. (2016).
18422	112	14			... Whilst the degree of resilience is mainly dependent on geographical area and crop. one could strongly question that statement. If kept need to provide adequate (peer review) references. [Andrea TILCHE, Belgium]	The word resilience has been replaced with the term compensation, as reported by Rose et al. (2016).
28374	112	14	112	14	There is only one citation on the fact that resilience depends on crop and geographical area. But there are many more papers on this (e.g. https://www.agmip.org/crop-modeling-team/). If the section is kept, please expand the reference cited and also include a reference for the first half of the paragraph. [Germany]	The word resilience has been replaced with the term compensation, as reported by Rose et al. (2016).
490	112	18	112	18	In the Section 3.4.6.2, Adaptation is not considered. As shown by Wei etal 2017, the CC impact can be reduced considerably if adapttion is taken into account. See e.g., Wei, T., S. Glomsrød and T. Zhang (2017). "Extreme weather, food security and the capacity to adapt – the case of crops in China." Food Security 9(3): 523-535. DOI: 10.1007/s12571-015-0420-6. [Taoyuan Wei, Norway]	In this section authors stated only the impact of climate change on crop systems, avoiding to explain the importance of adaptation measures due to formatting issues (no more space available for explaining details and advantages brought by the several adaptation options able to limit Climate Change impacts). However, the suggested reference has been inserted in relation to impacts of climate extremes on production.
1504	112	18	115	19	It is evident that crop production is strongly affected by differences in management, soils, climate (temperature and precipitation) and climate change, among others. This makes it difficult to identify the impacts while there is reason to believe that adaptation options in crop production are often very large and management effects can outcompete climate effects particularly where productivity is currently very low. To avoid this level of complexity and limit the space requirements, it may be worth focusing on studies that look at levels of impacts at 1.5 and 2°C while all other variables are kept unchanged. This is difficult enough because differences in average global temperatures have effects on local temperature and, more importantly, precipitation. [Karen Olsen, Denmark]	We thank the reviewer for the comment. However, studies which account for impacts at 1.5 to 2°C warming while maintaining other variables unchanged are really few.
6320	112	18	115	19	It is evident that crop production is strongly affected by differences in management, soils, climate (temperature and precipitation) and climate change, among others. This makes it difficult to identify the impacts while there is reason to believe that adaptation options in crop production are often very large and management effects can outcompete climate effects particularly where productivity is currently very low. To avoid this level of complexity and limit the space requirements, it may be worth focusing on studies that look at levels of impacts at 1.5 and 2°C while all other variables are kept unchanged. This is difficult enough because differences in average global temperatures have effects on local temperature and, more importantly, precipitation. [Anne Olhoff, Denmark]	We thank the reviewer for the comment. However, studies which account for impacts at 1.5 to 2°C warming while maintaining other variables unchanged are really few.
18424	112	18	115	19	It is evident that crop production is strongly affected by differences in management, soils, climate (temperature and precipitation) and climate change, among others. This makes it difficult to identify the impacts while there is reason to believe that adaptation options in crop production are often very large and management effects can outcompete climate effects particularly where productivity is currently very low. To avoid this level of complexity and limit the space requirements, it may be worth focusing on studies that look at levels of impacts at 1.5 and 2°C while all other variables are kept unchanged. This is difficult enough because differences in average global temperatures have effects on local temperature and, more importantly, precipitation. [Andrea TILCHE, Belgium]	We thank the reviewer for the comment. However, studies which account for impacts at 1.5 to 2°C warming while maintaining other variables unchanged are really few.
28376	112	18	115	22	Some paragraphs in 3.4.6.2 need a thorough language check, as they are in part not comprehensible. [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
45620	112	18			I find section 3.4.6.2. Crop production very chaotic with few clear conclusions and many mixing data. I think that would be better to focus on which effects can induce the different climate change-related factors on productivity and use the species as examples, and not focusing on species. Moreover, many of these studies are focused on just the increment of temperature without considering water avaliability, which is highly compromised under climate change and has the most important impact on crop productivity. [Adela M Sánchez-Moreiras, Spain]	We thank reviewer for this suggestion. The section has been revised
49634	112	18	115	19	The assertions on yield developments and potentials in chapter 2 should be checked if they are consistent with the excellent review presented here. [Karlheinz ERB, Austria]	We thank the reviewer for the suggestion. A double check has been done.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
60520	112	18	113	14	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	We thank the reviewer for the suggestion. Deleted
49222	112	18	115	19	This whole section is difficult to follow - it is a list of findings, but it does not do a good job of consolidating / assessing and comparing these findings in an easy-to-digest way. In this section it would be useful to split up crops by crop type (e.g. cash crops vs. food crops) and region. It would also be useful to summarise simplify how the severity of impacts is described (similar to how this is done in the oceans section above). [Bill Hare, Germany]	We thank the reviewer for the comment. The Section has been partly rewritten, simplifying the text. However, given the huge number of systems and at the same time the lack of specific studies focused on 1.5-2°C warming, it was not possible to highly specify impacts on all crops (i.e. cash crops, woody crops, vegetable, homemade crops, cereals, etc.). Currently, most studies focus on evaluating impacts between 1.5 to 2°C warming on the major cropping systems, which usually are those related to cereals.
28378	112	19	112	19	Please change into: focused on components that influence food production, and add: "Most importantly, climate and water", both are not mentioned. [Germany]	We thank the reviewer for the suggestion. The sentence has ben revised
28380	112	22	112	24	These two sentences should be merged. The changes have influenced suitability and production, also all crops have been impacted including the main ones. So, there is no need to mention them. [Germany]	We thank the reviewer for the suggestion. The sentence has ben revised
41430	112	22	112	27	Confidence levels in these findings, please. [Lourdes Tibig, Philippines]	We thank the reviewer for the suggestion. The sentence has ben revised
1500	112	23			Why limit yourself to the main agricultural crops? The statement is certainly true for most crops. [Karen Olsen, Denmark]	We thank the reviewer for the suggestion. However, due to limited text space in combination with number of studies which address impacts on crops at1.5-2°C, the main agricultural crops result to be (at the moment) the only which can really provide significant and reliable information.
6316	112	23			Why limit yourself to the main agricultural crops? The statement is certainly true for most crops. [Anne Olhoff, Denmark]	We thank the reviewer for the suggestion. However, due to limited text space in combination with number of studies which address impacts on crops at1.5-2°C, the main agricultural crops result to be (at the moment) the only which can really provide significant and reliable information.
18426	112	23			Why limit statement to the main agricultural crops? The statement is certainly true for most crops. [Andrea TILCHE, Belgium]	We thank the reviewer for the suggestion. However, due to limited text space in combination with number of studies which address impacts on crops at1.5-2°C, the main agricultural crops result to be (at the moment) the only which can really provide significant and reliable information.
492	112	24	112	25	add a reference: Wei, T., T. L. Cherry, S. Glomrød and T. Zhang (2014). "Climate change impacts on crop yield: Evidence from China." Science of The Total Environment 499: 133-140. DOI: 10.1016/j.scitotenv.2014.08.035. [Taoyuan Wei, Norway]	We thank the reviewer for the suggestion. Given the large number of reference asked to be added in the text we decided to report the most recent.
1502	112	24		27	Why leave out Africa? [Karen Olsen, Denmark]	CC impacts on crops were reported for Africa whilst just few info were find concerning livestock systems. Even if indirect effect of CC on crops and water resource will likely affect livestock sector in Africa, no studies currently investigates this issue. It is only possible to speculate on the expected impacts on livestock sector but there are not enough data to quantifying these impacts and at the same time to guarantee a reliable level of confidence.
6318	112	24		27	Why leave out Africa? [Anne Olhoff, Denmark]	CC impacts on crops were reported for Africa whilst just few info were find concerning livestock systems. Even if indirect effect of CC on crops and water resource will likely affect livestock sector in Africa, no studies currently investigates this issue. It is only possible to speculate on the expected impacts on livestock sector but there are not enough data to quantifying these impacts and at the same time to guarantee a reliable level of confidence.
18428	112	24		27	Why leave out Africa? [Andrea TILCHE, Belgium]	CC impacts on crops were reported for Africa whilst just few info were find concerning livestock systems. Even if indirect effect of CC on crops and water resource will likely affect livestock sector in Africa, no studies currently investigates this issue. It is only possible to speculate on the expected impacts on livestock sector but there are not enough data to quantifying these impacts and at the same time to guarantee a reliable level of confidence.
7828	112	25			A reference for the impacts of Climate change and variability in North America (midwest USA) on ocrn and soybean is: . Henson, C.B., A.R. Lupo, P.S. Market, and P.E. Guinan, 2017: ENSO and PDO-related climate climate variability impacts on Midwestern United States crop yields International Journal of Biometeorology DOI 10.1007/s00484-016-1263-3. [Anthony Lupo, United States of America]	We thank the reviewer for the suggestion. However, the effect of El Niño Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO) and improvement of agricultural practices and technology are the key aspect in the paper at determining yields change.
7830	112	26			A reference for the impacts of climate change on argicultural potential in southwest Russia (Europe) is: Lebedeva, M.G., Lupo, A.R., Henson, C.B., Solovyov, A.B., Chendev, Y.G., and P.S. Market, 2017: A Comparison of Bioclimatic potential of Two Global Regions during the Late 20th Century and Early 21st Century. International Journal of Biometeorology, 14pp DOI 10.1007/s00484-017-1470-6 [Anthony Lupo, United States of America]	We thank the reviewer for the suggestion. However, the effect of El Niño Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO) and improvement of agricultural practices and technology are the key aspect in the paper at determining yields change.
28382	112	26	112	26	This sentence implies that the impact on the main crops is not as decisive. Is this true? Can this be quantified? Also in comparison to the regional crops? Please clarify. [Germany]	We thank the reviewer for the suggestion. The sentence has been revised
41432	112	29	114	3	When possible, please indicate confidence levels. [Lourdes Tibig, Philippines]	Accepted- Modified as suggested

Comment No	From Page	From Line	To Page	To Line	Comment	Response
45622	112	29	113	1	I don't fully agree with this statement, as there are many studies showing the impact of climate change on rice yield and productivity as well as on timing of this crop; i.e. Kabir (2015) showed that increases in rice yield due to increases in incoming solar radiation and atmospheric carbon-di-oxide concentration are not significant compared to the negative effects of temperature. The effects were also on timing of rice "Increasing temperatures and solar radiation have been found to reduce the duration of physiological maturity of the rice varieties. Model results also suggest that in addition to reducing yield, climate change may also make rice yield more vulnerable to transplanting date, predicting significant reduction in yield as transplanting date is delayed, especially beyond 15 January." As well, van Oort and Zwart (2018) demonstrated that "without adaptation, irrigated rice yields in West Africa's Sahel region in the dry season would decrease by about 45 percent, and with adaptation, by about 15 per cent" and adaptation (i.e. irrigation) will become every time more difficult due to decreased water availability. [Adela M Sánchez-Moreiras, Spain]	We thank the reviewer for the suggestion. However, from the paper Kabir (2015) is not possible to retrieve specific indications related to future scenarios (2000-2100) and as well as differences between 1.5 - 2°C warming.
60522	112	29	113	4	The paper by Asseng et al. (2011; first published online in 2010) is an important reference regarding how important temperature increases are on wheat yield, using observations as well as simulation modeling. They showed that an increase of 2°C is highly significant. This paper was very important in motivating a wider range of other studies later on wheat yield impacts due to temperature increases, including the papers by Asseng and others that were cited. The citation for this 2010 paper is: Asseng, S., I. Foster, and N. C. Turner. 2011. The impact of temperature variability on wheat yields. Global Change Biology 17(2):997-1012. http://dx.doi.org/10.1111/j.1365-2486.2010.02262.x. [United States of America]	We thank the reviewer for the suggestion. However, from the paper was not easy to retrieve specific indications related to differences between 1.5 - 2°C warming. This focus was better extrapolated using Asseng et al 2015 which was indeed added in the chart.
30494	112	30	113	1	« whilst the effects on rice and soybean yields have been smaller(Kim et al., 2013). » Regarding rice and soybean, the uncertainty might be much higher [France]	Accepted- Modified as suggested
472	113	1	113	3	One additional reference: Wei, T., T. L. Cherry, S. Glomrød and T. Zhang (2014). "Climate change impacts on crop yield: Evidence from China." Science of The Total Environment 499: 133-140. DOI: 10.1016/j.scitotenv.2014.08.035. [Taoyuan Wei, Norway]	We thank the reviewer for the suggestion. Given the large number of reference asked to be added in the text we decided to report the most recent.
494	113	1	113	1	A typo: "been smaller(Kim" should be "been smaller (Kim" [Taoyuan Wei, Norway]	Accepted- Checked and corrected within the text
7832	113	1	113	14	The reference in comment #22 above demonstrates positive impacts on corn yeilds for the midwest USA, but also there is much stronger variability in yields with the late 20th centruy - early 21st century warming. [Anthony Lupo, United States of America]	We thank the reviewer for the suggestion
22152	113	1		48	Please review and correct spaces between words (e.g. lines 1, 10, 16, 17, 20, 21, 24, 27, 31, 44, 48) [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
28384	113	1	113	14	The first paragraph lists the positive effects of CC and the end of the second paragraph as well. This should be please put together. [Germany]	We thank the reviewer for the comment. The sections have been incorporated in each other.
44536	113	1	113	48	Spacing issue in numerous places [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text
22154	113	2		3	Please note that a comma must be inserted in between of the authors names and the year of publication (six cases in these two lines). [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
104	113	6	113	8	Ray et al. (2015, doi:10.1038/ncomms6989) studies the yield impacts associated with climate variability, but not climate trends. Therefore, the estimate of yield impact (>60% of yield variability) referred here can not directly be compared to the estimate from Moore and Lobell (2015) which assessed the yield impacts due to climate trends. I would suggest to add a short explanation why the yield imapcts due to climate variability and those due to climate trends can be compraed here or simply delete this sentence. [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. Sentence has been revised.
12092	113	6	113	8	The Ray study does not consider climate change according to the meaning of the 1.5°C report, only observed climate variability. It is therefore misleading to attribute 60% of yield variability to climate change, rather it should be natural climate variability. Additionally, other recent work has investigated the climate risk of simultaneous crop failures across multi-breadbasket regions (Kent, C., Pope, E., Thompson, V., Lewis, K., Scaife, A.A. and Dunstone, N., 2017. Using climate model simulations to assess the current climate risk to maize production. Environmental Research Letters, 12(5), p.054012.). This work finds the risk of multi bread-basket failure to be 6% per decade as a result of current natural climate variability. [United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the comment. Sentence has been revised. Also, the suggested reference has been added
42792	113	6	113	14	Beyond CO2, tropospheric ozone can also impact crop yields for these staple crops; this is mentioned in the following paragraph, but may be more suitable if located here. [Kristin Campbell, United States of America]	We thank the reviewer for the comment. Info related to ozone impacts were deleted given the few studies focused on 1.5-2°C warming impacts
43030	113	6	113	14	Beyond CO2, tropospheric ozone can also impact crop yields for these staple crops; this is mentioned in the following paragraph, but may be more suitable if located here. [Durwood Zaelke, United States of America]	We thank the reviewer for the comment. Info related to ozone impacts were deleted given the few studies focused on 1.5-2°C warming impacts
1506	113	7			climate change or climate variability? Climate variability is more likely to explain the yield variability. [Karen Olsen, Denmark]	Accepted- Modified as suggested
6322	113	7			climate change or climate variability? Climate variability is more likely to explain the yield variability. [Anne Olhoff, Denmark]	Accepted- Modified as suggested
18430	113	7			climate change or climate variability? Climate variability is more likely to explain the yield variability. [Andrea TILCHE, Belgium]	Accepted- Modified as suggested
35962	113	9	113	9	May consider adding - In India, wheat yields are reported to be affected when seasonal mean maximum and minimum temperatures exceed 27/13 degree C (Naresh Kumar et al., 2014). Ref Naresh Kumar S, P. K. Aggarwal, D. N. Swarooparani, Rani Saxena, Nitin Chauhan, Surabhi Jain (2014). Vulnerability of wheat production to climate change in India. Climate Research. doi: 10.3354/cr01212 ; Vol. 59: 173–187, 2014. Similary for Indian mustard, yield is projected to reduce in regions with current mean seasonal temperature regimes above 25/10 degree C (Tmax/Tmin) during crop growth (Naresh Kumar et al., 2014b) ref 5. Naresh Kumar Soora, Pramod Kumar Aggarwal, Kumar Uttam, Jain Surabhi, D. N. Swaroopa Rani, Nitin Chauhan and Rani Saxena (2014b). Vulnerability of Indian mustard (Brassica juncea (L.) Czernj. Cosson) to climate variability and future adaptation strategies. Mitigation and Adaptation Strategies to Global Change. 10.1007/s11027-014-9606-Z; 21(3), 403-420 [India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40838	113	9	113	9	Consider adding, In India, wheat yields are reported to be affected when seasonal mean maximum and minimum temperatures exceed 27/13 oC (Naresh Kumar et al., 2014). Ref Naresh Kumar S, P. K. Aggarwal, D. N. Swarooparani, Rani Saxena, Nitin Chauhan, Surabhi Jain (2014). Vulnerability of wheat production to climate change in India. Climate Research. doi: 10.3354/cr01212 ; Vol. 59: 173–187, 2014. Similary for Indian mustard, yield is projected to reduce in regions with current mean seasonal temperature regimes above 25/10°C (Tmax/Tmin) during crop growth (Naresh Kumar et al., 2014b) ref 5. Naresh Kumar Soora, Pramod Kumar Aggarwal, Kumar Uttam, Jain Surabhi, D. N. Swaroopa Rani, Nitin Chauhan and Rani Saxena (2014b). Vulnerability of Indian mustard (Brassica juncea (L.) Czernj. Cosson) to climate variability and future adaptation strategies. Mitigation and Adaptation Strategies to Global Change. 10.1007/s11027-014-9606-Z; 21(3), 403-420 [NARESH KUMAR SOORA, India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
496	113	10	113	10	A typo: "when temperaturesare" should be "when temperatures are" [Taoyuan Wei, Norway]	Accepted- Checked and corrected within the text
6832	113	10	113	10	when temperaturesare above' should be 'when temperatures are above' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10878	113	10	113	10	Change to 'revealed that when temperatures are above 30°C, US…' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
35964	113	10	113	10	Add space between 'temperature' and 'are' [India]	Accepted- Checked and corrected within the text
28386	113	11	113	11	Please use compensate instead of reduce. [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
498	113	12	113	12	A typo: "(e.g., Canada),Qian" should be "(e.g., Canada), Qian" [Taoyuan Wei, Norway]	We thank the reviewer for the comment. The section has been revised and rewritten.
28388	113	13	113	14	The positive effects of a longer growing season are mentioned later, but we would expect them already here. Please refer also to missing snow cover and the necessary cold-shock for some crops. [Germany]	We thank the reviewer for this suggestion. The paragraph has been rewritten. However, due to formatting issues, not all info can be added. Particularly, the paragraph is focused at evaluating the impacts between 1.5 to 2°C warming as well as to provide indication about the general direction of the ag sector if warming will increase.
10880	113	16	113	16	Change to 'However, increases in atmospheric CO2 would be expected to…' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
28390	113	16	113	32	Please consider that the fast growth as a result of more CO2 can also lead to lower protein values in several grains. [Germany]	Accepted- We added this suggestion into the text
30496	113	16	113	32	This section should focus first on crop productivity and then on quality (nutrition then disease). Right now, it is a bit confusing This section should be more clear about the role of CO2 concentration in projected yields. Especially for rice or soybean, one has to take into account both scenarios (with and without CF effect) to assess the whole range of plausible futures [France]	We thank the reviewer for the comment. The section has been revised and rewritten. Some parts were deleted and summarized due to formatting issues
35966	113	16	113	16	May consider adding - after 'However' - elevated CO2 is reported to reduce the negative impacts not only in annual crops but also in perennial crops. For example,in coconut, a perennial plantation, annual mean, maximum and minimum temperatures above 28 degree C, 33 degree C and 23 degree C respectively, affect productivity. To offset the yield reduction due to a 2 oC increase in temperature, coconut palms in the central-west region of India may require 450 ppm of CO2, while those in the upper eastern-coastal region may require 550 ppm. Similarly, to offset the yield reduction due to a 3 degree C rise in temperature, CO2 concentration should be 450 ppm in the central plains and 600 ppm in the south eastern-coast. On the other hand, even a 1 degree C increase in temperature is projected to affect coconut productivity in central parts of coastal Andhra Pradesh and Orissa, reflecting current high summer temperatures and making these regions more vulnerable, in spite of beneficial effects of increased CO2 (Naresh Kumar and Aggarwal, 2013). (Ref Naresh Kumar, S. and P.K. Aggarwal. 2013. Climate change and coconut plantations in India: Impacts and potential adaptation gains. Agril. Syst. http://dx.doi.org/10.1016/j.agsy.2013.01.001, 117: 45–54) [India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
40840	113	16	113	16	Please consider adding, after However, elevated CO2 is reported to reduce the negative impacts not only in annual crops but also in perennial crops. For example,in coconut, a perennial plantation, annual mean, maximum and minimum temperatures above 28 oC, 33 oC and 23 oC respectively, affect productivity. To offset the yield reduction due to a 2 oC increase in temperature, coconut palms in the central-west region of India may require 450 ppm of CO2, while those in the upper eastern-coastal region may require 550 ppm. Similarly, to offset the yield reduction due to a 3 oC rise in temperature, CO2 concentration should be 450 ppm in the central plains and 600 ppm in the south eastern-coast. On the other hand, even a 1 oC increase in temperature is projected to affect coconut productivity in central parts of coastal Andhra Pradesh and Orissa, reflecting current high summer temperatures and making these regions more vulnerable, in spite of beneficial effects of increased CO2 (Naresh Kumar and Aggarwal, 2013). (Ref Naresh Kumar, S. and P.K. Aggarwal. 2013. Climate change and coconut plantations in India: Impacts and potential adaptation gains. Agril. Syst. http://dx.doi.org/10.1016/j.agsy.2013.01.001, 117: 45–54) [NARESH KUMAR SOORA, India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
6834	113	20	113	20	decrease of 13.7%when a' should be 'decrease of 13.7% when a' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
6836	113	20	113	20	further increase in CO2has been' should be 'further increase in CO2 has been' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
12094	113	21	113	23	This sentence appears to suggest that the statement is based on historical observations rather than model projections of the future. [United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the comment. The section has been revised and rewritten.
30498	113	23	113	26	We suggest to have a look at the review made by Myers et al (2014) (doi:10.1038/nature13179). they show a robust decrease for Zn, Fe, Phytate and Proteins for wheat and rice [France]	Accepted- References added
32314	113	23	113	26	A reference should be cited for this meta-analysis [Aaron Glenn, Canada]	We thank the reviewer for the comment. The section has been revised and rewritten. More references have been added into the text
105	113	26	113	27	I do not understand why the impacts of ozone suddenly appears here. Although the ozone impact itself is important, I would suggest that the description on yield impacts associated by factors other than climate change and CO2 appears after the description on climate/CO2 impacts in this paragraph. Another option is to move this sentence to other paragraph describing the multi-factor-combined impacts (P115L5-L19). [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. The section has been revised and rewritten. The part related to the ozone has been moved and better specified into the text

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62072	113	27	113	32	The publication below could be add to this paragraph. In fact, Krishman et al, 2007 explain that (for every 1 °C increase in temperature, Two rice models (ORYZA1 and INFOCROP) predicted average yield changes of ?7.20 and ?6.66%, respectively, at the current level of CO2 (380 ppm). But increases in the CO2 concentration up to 700 ppm led to the average yield increases of about 30.73% by ORYZA1 and 56.37% by INFOCROP rice.) Krishnan P, Dillip K B. Chandra Bhaskar, Nayk S. K, Dash R.N. 2007.Impact of elevated CO2 and temperature on rice yield and methods of adaptation as evaluated by crop simulation studies. 2007. Agriculture Ecosystems & Environment 122(2):233-242. [Rachid MOUSSADEK, Morocco]	We thank the reviewer for the suggestion. However, given the huge number of references suggested to insert in the text, we have decided to add the most recent references.
6838	113	32	113	32	deficitmay' should be 'deficit may' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10882	113	32	113	32	Change to 'yield under water deficit may be significantly underestimated….' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
30500	113	32	113	32	Typo : add a space between "deficit" and "may" [France]	Accepted- Checked and corrected within the text
60524	113	34	114	45	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	We thank the reviewer for the comment. The sentence has been rewritten
474	113	35	113	36	One additional reference: Wei, T., T. Zhang, K. de Bruin, S. Glomrød and Q. Shi (2017). "Extreme Weather Impacts on Maize Yield: The Case of Shanxi Province in China." Sustainability 9(3): 523-535. DOI: 10.3390/su9010041. [Taoyuan Wei, Norway]	Accepted- Reference was added
22156	113	37		39	Please note that a comma must be inserted in between of the authors names and the year of publication (six cases in these three lines). [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
106	113	40	113	40	9-10% relative to what? Please consider mentioning the reference when a percentage is used. [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. The sentence has been changed and the text revised
35968	113	40	113	40	May consider adding - In India, climate extreme events like cyclones (1995) and droughts (1998-2002) significantly reduced coconut yields for 5-6 years (Naresh Kumar, 2011). Length and frequency of dry spell has negative impact of coconut yields (Naresh Kumar et al., 2007). Apple productivity declined in Himachal Pradesh in India up to 1500 m msl to the tune of 40–50% due to warmer climate. Lack of chilling requirement fulfilment during winter and warmer summers in lower elevations resulted in shifting of apple production to higher elevation (2700 m msl) (Bhagat et al., 2009). Cold waves (December 2002–January 2003) caused considerable damage to horticultural crops such as mango, guava, papaya, brinjal, tomato, potato (Naresh Kumar et al., 2011). In potato, frost damage reduced tuber yield by 10–50% depending upon intensity and coincidence with sensitive stage, while yield loss due to high temperature was to the tune of 10– 20% depending on coincidence with sensitive stage. High temperatures reduced marketable grade potato tuber yield to the extent of 10–20% (Singh et al., 2010). Ref Naresh Kumar, S. 2011. Climate change and Indian agriculture: Current understanding on impacts, adaptation, vulnerability and mitigation. J. Plant Biol. 37 (2):1-16. Naresh Kumar S, Rajagopal V, Siju Thomas T, Vinu K, Cherian Ratheesh Narayanan M K, Ananda K S, Nagawekar D D, Hanumanthappa M, Vincent S and Srinivasulu B 2007 Variations in nut yield of coconut (Cocos nucifera L.) and dry spell in different agroclimatic zones of India; Indian J Hort 64 : 309–313. Bhagat R M, Rana R S and Kalia V 2009 Weather changes related shift in apple belt in Himachal Pradesh; in Global climate change and Indian Agriculture-case studies from ICAR network project (ed.) P K Aggarwal (New Delhi, ICAR) pp 48– 53 Singh J P, Lal S S, Govindakrishnan P M, Dua V K and Pandey S K 2010 Impact of climate change on potato in India; in Challenges of climate change – India Horticulture (eds) H P Singh, J P Singh and S S Lal (New Delhi, Westville Publishing House) pp 90–99. [India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
40842	113	40	113	40	In India, climate extreme events like cyclones (1995) and droughts (1998-2002) significantly reduced coconut yields for 5-6 years (Naresh Kumar, 2011). Length and frequency of dry spell has negative impact of coconut yields (Naresh Kumar et al., 2007). Apple productivity declined in Himachal Pradesh in India up to 1500 m msl to the tune of 40–50% due to warmer climate. Lack of chilling requirement fulfilment during winter and warmer summers in lower elevations resulted in shifting of apple production to higher elevation (2700 m msl) (Bhagat et al., 2009). Cold waves (December 2002–January 2003) caused considerable damage to horticultural crops such as mango, guava, papaya, brinjal, tomato, potato (Naresh Kumar et al., 2011). In potato, frost damage reduced tuber yield by 10–50% depending upon intensity and coincidence with sensitive stage, while yield loss due to high temperature was to the tune of 10– 20% depending on coincidence with sensitive stage. High temperatures reduced marketable grade potato tuber yield to the extent of 10–20% (Singh et al., 2010). Ref Naresh Kumar, S. 2011. Climate change and Indian agriculture: Current understanding on impacts, adaptation, vulnerability and mitigation. J. Plant Biol. 37 (2):1-16. Naresh Kumar S, Rajagopal V, Siju Thomas T, Vinu K, Cherian Ratheesh Narayanan M K, Ananda K S, Nagawekar D D, Hanumanthappa M, Vincent S and Srinivasulu B 2007 Variations in nut yield of coconut (Cocos nucifera L.) and dry spell in different agroclimatic zones of India; Indian J Hort 64 : 309–313. Bhagat R M, Rana R S and Kalia V 2009 Weather changes related shift in apple belt in Himachal Pradesh; in Global climate change and Indian Agriculture-case studies from ICAR network project (ed.) P K Aggarwal (New Delhi, ICAR) pp 48– 53 Singh J P, Lal S S, Govindakrishnan P M, Dua V K and Pandey S K 2010 Impact of climate change on potato in India; in Challenges of climate change – India Horticulture (eds) H P Singh, J P Singh and S S Lal (New Delhi, Westville Publishing House) pp 90–99. [NARESH KUMAR SOORA, India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
107	113	42	113	44	Some progesses in crop pest and pathgens are found in Bebber et al. (2013, 2014). Bebber, D. P., Ramotowski, M. A. T., and Gurr, S. J. (2013) Crop pests and pathogens move polewards in a warming world. Nature Climate Change, 3, 985-988, doi:10.1038/nclimate1990. Bebber, D. P., Holmes, T. and Gurr, S. J. (2014), The global spread of crop pests and pathogens. Global Ecology and Biogeography, 23: 1398–1407. doi:10.1111/geb.12214 [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. The section has been revised and rewritten. Several references have been added. However, due to formatting issues, not all references can be added, but only the most recent ones.
49718	113	42	113	44	In this sentence, the description of '...that allows pests to survive' does not correspond to the former description on 'disease'. [Yinlong XU, China]	We thank the reviewer for the comment. The sentence has been rewritten
51004	113	42	128	42	Please remove the dot befor Cramer et al. (2014) [Fatima Driouech, Morocco]	Editorial - copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
28392	113	47	113	47	Please add here a new headline for the projections (Projected impacts). [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
60526	114	5	115	19	If these scenarios account for zero adaptation, they should be described as such. [United States of America]	We thank the reviewer for the comment. However, all these impacts reported do not consider adaptation options. Adaptation strategies cannot be considered in this chapter, where only impacts are addressed, since for the readers it is important to point out which would be the impacts of warming on the several ag systems worldwide. This can pose the basis for developing new adaptation options which, however, would be less considered if impacts would be reported as already reduced.
108	114	8	114	8	C&S. Does it mean "Central and South"? [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. The section has been revised and rewritten.
22158	114	8			C&S America should be spelled in full (Central and South America.. or otherwise simplify to "Latin-America") [LUIS VALDES, Spain]	We thank the reviewer for the comment. The section has been revised and rewritten.
28394	114	8	114	8	What is "cropland stability"? [Germany]	The sentence has been corrected
50588	114	8	114	8	It's true that Ricke et al. highlight this aspect, but they do so based on data shown in Piontek et al. (2013, 10.1073/pnas.1222471110). Therefore it would be good to at least cite both studies, or only Piontek et al. [Jacob Schewe, Germany]	We thank the reviewer for the comment. The Piontek references has been added
62074	114	8	114	9	In the paper below (Iizumi et al., 2017), highlight how globally, crop type stability impacted by warming. The results based on the interpolated ensemble global mean yields suggest that impacts of the two warming levels (1.5?°C and 2.0?°C) could be distinguished for maize, soybean and rice, but not for wheat. This indicates there is an important source of uncertainty when discussing differences in impacts on crop yields at temperature increases of between 1.5?°C and 2.0?°C. Toshichika Iizumi, Jun Furuya, Zhihong Shen, Wonsik Kim, Masashi Okada, Shinichiro Fujimori, Tomoko Hasegawa & Motoki Nishimori. 2017. Responses of crop yield growth to global temperature and socioeconomic changes. Scientific Reports, volume 7, Article number: 7800 (2017), doi:10.1038/s41598-017-08214-4 [Rachid MOUSSADEK, Morocco]	We agree with the reviewer. However, despite models outcomes sometimes can provide different pattern due to several causes (i.e. GCM used or calibrated, model calibration phases, modeling approaches, type of model used and so on) there is a general consensus that indicates as warming increase leads to detrimental issues in the agricultural sector. These issues have to be associated with crop response to climatic factors (mean and extremes), increase of energy supply (i.e. irrigation, fertilizer), economic losses (i.e. increase of energy demand, assurances, crop declines, etc.). all these data appear confirmed by the wide scientific literature that, year by year, provide more and more indication of these changes compared to past conditions. These info are particularly interesting when long-term studies are reported, since it is possible to have a complete view of the rapid changes that are addressing the ag sector.
22160	114	9		46	Please review and correct spaces between words (e.g. lines 9, 18, 19, 39, 40, 41, 46) [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
44538	114	9	114	48	Spacing issue in numerous places [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text
28396	114	10	114	10	Is the response really linear? [Germany]	We thank the reviewer for the comment. The sentence has been deleted
109	114	14	114	14	No year is noted for Warren b et al. [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. The section has been revised and rewritten.
22162	114	14			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	We thank the reviewer for the comment. The section has been revised and rewritten.
32316	114	14			Warren et al. reference missing year, "b" should be deleted? [Aaron Glenn, Canada]	We thank the reviewer for the comment. The section has been revised and rewritten.
35970	114	14	114	14	Incomplete reference Warren b et al. Add complete reference [India]	We thank the reviewer for the comment. The section has been revised and rewritten.
60528	114	14	114	14	The reference to Warren et al. has a problem. There seems to be a "b" inserted out of place. [United States of America]	We thank the reviewer for the comment. The section has been revised and rewritten.
111	114	18	114	36	Some modeling studies referred here consider the CO2 fertilization effect on yield (e.g., Iizumi et al., 2017) and others are not (Asseng et al., 2015, doi:10.1038/nclimate2470; Zhao et al., 2017, doi:10.1073/pnas.1701762114). This fact affects the interpretation of the impact estimates presented here to some degree and hence is worth to briefly note here to call attention of readers. [Toshichika Iizumi, Japan]	We thank the reviewer for the comment. However, in this chart it is important to provide information about the "general direction" of the agricultural sector moving from 1.5 to 2°C warming. In this context, both studies (i.e. those considering CO2 effect and those does not consider it) are important since results are to be a guide for the Paris aims, indicating a detrimental effect if warming is above 1.5°C. Despite, it would be interesting to more specifically talk about the differences, if CO2 fertilizer effect is considered, it is not possible to address here this topic due to formatting issues.
8652	114	20	114	20	conjunctionwith' should be 'conjunction with' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
8654	114	21	114	21	conjunctionwith' should be 'conjunction with' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10884	114	21	114	21	Change to 'increase to +2°C in conjunction with reduction in precipitation,…' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
35178	114	21	114	21	The spacing is missing between the words "conjunctionwith" [Shaukat Ali, Pakistan]	Accepted- Checked and corrected within the text
60530	114	23	114	23	2°C warming would result in 3.2-4°C warming - something missing - 'global warming vs. local warming'? [United States of America]	The sentence has been deleted
8656	114	25	114	25	a general declines' should be 'a general decline' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
28398	114	25	114	26	The connection between yield and productivity does not become clear, please clarify. [Germany]	The sentence has been rewritten
110	114	26	114	26	Again, Lizumi et al. (2017) needs to be adjusted to be Iizumi et al. (2017). [Toshichika Iizumi, Japan]	Accepted. Reference has been corrected.
2218	114	26	114	26	Lizumi' should be 'Iizumi' [Akihiko Ito, Japan]	Accepted. Reference has been corrected.
34784	114	28	114	29	The sentence says 'They also indicated an increase in rice production under +2°C than at +1.5°C warming'. Did this mean to say 'rice production losses'? I think there is a word missing in the sentence. [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the comment. The section has been revised and rewritten.
60532	114	28	114	29	an increase in rice production under +2°C than at +1.5°C warming - do you mean a 'greater' increase? [United States of America]	Accepted- Changed according to reviewer comment
22166	114	29		35	Regarding rice crops, I see some contradictory data in this paragraph. It is said that "Lizumi et al. (2017), indicated an increase in rice production under +2°C than at +1.5°C warming" whereas "Zhao et al., 2017a), combining four different methods for assessing the impact of each degree Celsius increase in global mean temperature on yields of rice, showed a global average reduction of 3.2 ± 3.7%. Contradictory data always confounds the reader. My suggestion is to simplify the wording, or otherwise present these data in a table. [LUIS VALDES, Spain]	We thank the reviewer for the comment. The sentences have been rewritten
8658	114	30	114	31	indicated as for each ?C increase in global mean temperature can be observed' should be 'indicated that for each ?C increase in global mean temperature one can observe' [Robert Shapiro, United States of America]	We thank the reviewer for the comment. The section has been revised and rewritten.
22164	114	30			please correct position of º in ºC [LUIS VALDES, Spain]	We thank the reviewer for the comment. The section has been revised and rewritten.
10536	114	31	114	31	Here, “(Zhao et al., 2017a)” should be “Zhao et al. (2017a)”. [Hong Yang, Switzerland]	Accepted- Checked and corrected within the text
4304	114	35	114	35	The term "Indochina peninsula" is not clear in geography. It seems to me that it is a very out-dated geographic term that was used decades ago. [Gensuo JIA, China]	We thank reviewer for the comment. We deleted the word "Indochina peninsula". It was replaced with "greater Mekong sub-region"

Comment No	From Page	From Line	To Page	To Line	Comment	Response
8354	114	35	114	35	The “Indochina peninsula”, which refers to the five countries of Vietnam, Laos, Cambodia, Myanmar and Thailand or the three countries of Vietnam, Laos and Cambodia, is seldom used for the time being. The five countries can now be referred to with the ‘greater Mekong sub-region’. To be clear in reference, it is suggested to give country names directly. [China]	We thank reviewer for the comment. We deleted the word "Indochina peninsula". It was replaced with "greater Mekong sub-region"
16366	114	38	114	49	This passage suggests there would be no net difference, if so, please state that to be the case. [Australia]	The sentence has been rewritten
112	114	39	114	39	wellfor -> "well for" [Toshichika Iizumi, Japan]	Accepted- Checked and corrected within the text
8660	114	39	114	39	as wellfor' should be 'as well for' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10886	114	39	114	39	Change to 'impacts projected as well for…' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
30502	114	40	114	40	In this chapter, you quote several times these results as from the WB. Actually, this WB report just quote Burke et al work (Shifts in African crop climates by 2050, and the implications for crop improvement and genetic resources conservation. Global Environ. Change (2009)) Some points about it: - "current conditions" are actually 1993-2002. - This study is based only on temperature distribution (no rainfall, radiation change) - please have a look at ramires villegas & thornton (2015) Climate change impacts on African crop production. CCAFS working paper. ==> the suitability change results are quite different for some crops like millet (2050s, RCP8.5 and positive change over the Sahel) We suggest to be more careful in using such results [France]	The reference "Burke et al., 2009 " has not been considered in section 3.4.6 anymore
478	114	41	114	41	A typo: "result infurther" should be "result in further" [Taoyuan Wei, Norway]	Accepted- Checked and corrected within the text
8662	114	41	114	41	infurther yields losses' should be 'in further yield losses' [Robert Shapiro, United States of America]	We thank the reviewer for the comment. The section has been revised and rewritten.
10888	114	41	114	41	Change to 'would result in further yields losses and…' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
30504	114	42	114	42	Actually sultan et al. (2013) show in West Africa robust millet and sorghum yield losses due to temperature rise but rainfall change can only partially compensate this loss. Over a certain level of warming, yield changes are negative for all scenarios. CO2 effect cannot offset CC change for C3 crops (most of the scenarios) [France]	We thank the reviewer for the suggestion. The text has been modified, now including rainfall effects
8664	114	46	114	46	general crop yield decreases.' should be 'general crop yield decrease.' [Robert Shapiro, United States of America]	We thank the reviewer for the comment. The section has been revised and rewritten.
8666	114	48	114	48	soybean.Läderach et al. should be 'soybean. Läderach et al. [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
35972	115	3	115	3	May consider adding - House hold level analysis in India indicated that agricultural profit of adapted farmers was more than that of non–adapted farmers in all strata according to the difference in difference model ; non-adapted farmers in less than 1.5 ha, have to either alter the existing agricultural practices to reduce management cost and increase profit or incur additional cost for adaptation; farmers with over 2ha may have to rationalize their management investments for gaining more profits; the analysis also indicates that profit is not directly proportional to the cost of adaptation, if any, among different strata of farmers; small and marginal farm (<1.5 ha) families cannot support themselves with agricultural income alone, however with adaptation, self-sustaining agriculture could be achieved; adopting proper varieties, crop, water and livestock management strategies, income diversification and technical know-how can reduce the cost of farm operations, and increase agricultural profits as well as adaptive capacity to climatic risks; and additional cost is not always required for adaptation, and rationalizing agricultural expenditure through scientific crop management is essential for adapting to climatic risks. Therefore at a community level, which comprises a mixture of different sizes of landholding, differential costs of adaptation and profits are likely. Policies for incentivizing these ‘responsive adaptation’ costs for small and marginal farmers would be required. However, investments may be required for establishing permanent agricultural– infrastructure for managing water and agricultural produce to sustain agricultural profitability (Naresh Kumar et al., 2016) Ref: 3. Naresh Kumar S., Anuja, Md. Rashid, S.K. Bandyopadhyay, Rabindra Padaria and Manoj Khanna 2016 Adaptation of farming community to climatic risk: does adaptation cost for sustaining agricultural profitability? Current Science, 110 (10): 1216-1224. [India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
40844	115	3	115	3	House hold level analysis in India indicated that agricultural profit of adapted farmers was more than that of non–adapted farmers in all strata according to the difference in difference model ; non-adapted farmers in less than 1.5 ha, have to either alter the existing agricultural practices to reduce management cost and increase profit or incur additional cost for adaptation; farmers with over 2ha may have to rationalize their management investments for gaining more profits; the analysis also indicates that profit is not directly proportional to the cost of adaptation, if any, among different strata of farmers; small and marginal farm (<1.5 ha) families cannot support themselves with agricultural income alone, however with adaptation, self-sustaining agriculture could be achieved; adopting proper varieties, crop, water and livestock management strategies, income diversification and technical know-how can reduce the cost of farm operations, and increase agricultural profits as well as adaptive capacity to climatic risks; and additional cost is not always required for adaptation, and rationalizing agricultural expenditure through scientific crop management is essential for adapting to climatic risks. Therefore at a community level, which comprises a mixture of different sizes of landholding, differential costs of adaptation and profits are likely. Policies for incentivizing these ‘responsive adaptation’ costs for small and marginal farmers would be required. However, investments may be required for establishing permanent agricultural– infrastructure for managing water and agricultural produce to sustain agricultural profitability (Naresh Kumar et al., 2016) Ref: 3. Naresh Kumar S., Anuja, Md. Rashid, S.K. Bandyopadhyay, Rabindra Padaria and Manoj Khanna 2016 Adaptation of farming community to climatic risk: does adaptation cost for sustaining agricultural profitability? Current Science, 110 (10): 1216-1224. [NARESH KUMAR SOORA, India]	We thank the reviewer for the comment. However, due to formatting issues, the space available for explaining more in detail all these information is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
12014	115	4	115	19	No mention of 1.5 degrees - discussion of warming/heat in relation to ozone but impacts related to specific global temperature changes not discussed. [United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the comment. Impacts due to ozone are deleted given the lack of studies focused at 1.5-2°C warming.
8668	115	5	115	5	district-wise cotton' should be 'district-wide cotton' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
16368	115	5	115	5	Please explain here the relationship between CO2/climate and ozone. [Australia]	We thank the reviewer for the comment. Impacts due to ozone are deleted given the lack of studies focused at 1.5-2°C warming.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32840	115	5	115	11	Related to my comment regarding p 118, lines 17-19, there has been little work that I can find including climate change, CO2 and ozone all together. The papers discussed here are ozone only, then climate and ozone, whereas most of the studies cited previously were climate only or climate and CO2, but not all three. This seems an important gap to me, and I published an initial rather simple attempt to include all three (Shindell, D. T. (2016), Crop yield changes induced by emissions of individual climate-altering pollutants, Earth's Future, 4, 373–380, doi:10.1002/2016EF000377), and one of the key insights is that it can be quite important to consider which pollutants have driven the particular climate change being considered. For example, if more of the warming is caused by methane relative to CO2 for a particular level of warming (such as 1.5C or 2C), the crop impacts can be quite different as the climate impacts of CO2 tend to be partially offset by fertilization whereas the climate effects of methane are augmented by ozone damage. This comes up again on p 118, so might be useful to mention in at least one of those places that the results are pathway-dependent and sensitive to the relative impacts of various drivers in getting to even the exact same temeprature value. [Drew SHINDELL, United States of America]	We thank the reviewer for the comment. Impacts due to ozone are deleted given the lack of studies focused at 1.5-2°C warming.
35974	115	5	115	7	The study Ghude et al. (2014) has major drawbacks and the reference should be removed from the report. There is no question of the phytotoxicity of Ozone. However, the results obtained in many studies of its effects are primarily supported by controversial statistical techniques (Kickert and Krupa, 1991) and, therefore, the fact remains that the results cannot be validated and show considerable variability from season to season and from location to location most likely because of the types of experimental designs used. A major additional uncertainty in this study lies in the application of pooled Exposure–Response relationships, derived for European and North-American crops, to crops over the India without taking into account possible biases in ozone sensitivity for particularly Indian cultivars. Exposure–Response metrics used in the study are not suitable for Indian Region and there is a need for the new metrics that are based on factors suitable for Indian region as the seed types, agriculture practices and climate being very different in this region compared to mid and high latitude. [India]	We thank the reviewer for the comment. The sentences have been deleted.
8670	115	6	115	6	century found that' should be 'century and found that' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
8672	115	10	115	10	CO? , found that' should be 'CO?, found that' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
8674	115	11	115	11	indicated as, depending' should be 'indicated that, depending' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
22168	115	16		30	Please review and correct spaces between words (e.g. lines 16, 24, 28, 30) [LUIS VALDES, Spain]	Checked and corrected
45624	115	19			I suggest including at the end of section 3.4.6.2. data about crop producitvity affected by alterations on phenological timing, i.e. the decoupling of plant life cycle and pollinators/seed dispersals life cycles, as the area covered by pollinator-dependent crops has increased by more than 300 percent during the past 50 years (Aizen et al. 2008; Aizen and Harder 2009). Although few studies have been made on the mismatch among plants and pollinators, there are some works highlighting the importance of these events on a climate change scenario, as climate change may affect the phenology and distribution ranges of both crop plants and their most important pollinators, leading to temporal and spatial mismatches (Kjohl et al., 2011). Hegland et al (2009) found that "timing of both plant flowering and pollinator activity seems to be strongly affected by temperature. Insects and plants may react differently to changed temperatures, creating temporal (phenological) and spatial (distributional) mismatches – with severe demographic consequences for the species involved. Mismatches may affect plants by reduced insect visitation and pollen deposition, while pollinators experience reduced food availability." [Adela M Sánchez-Moreiras, Spain]	We thank the reviewer for the suggestion. However, all these impacts are already implicitly considered in the studies related to crop yield. Change in phenology is considered by models which, when provide results related to change in yield, they have already considered change in phenological pattern.
45626	115	19			Data about changing emission of volatiles (VOCs) by plants, which are the responsible to atract pollinators/seed dispersals, are also necessary to be included in section 3.4.6.2. Temperature changes and plant stress response to drought, pest pressure, etc. are expected to induce changes in the composition (quantitatively and qualitatively) of the secondary metabolites profile that drive multi-trophic interactions in the ecosystems. This can be crucial for crop productivity and ecosystem development, as a change in plant VOCs composition directly results in altered pollination, seed dispersion and disease management in plants. See Yuan et al (2009); Valolahti et al (2015); Kramshoj et al (2016), who found that "warming caused a 260% increase in total emission rate for the ecosystem and a 90% increase in emission rates for plants"; and many others. Although there is notable uncertainty in present-day estimates of BVOC emissions, specially interesting is the fact that these volatile organic compounds can moreover exacerbate plant stress by tropospheric ozone formation (isoprene reacts rapidly with hydroxyl radicals to form peroxy radicals, which can react with nitrogen oxides to form ground-level ozone; Fehsenfeld et al., 1992). Changing the chemical profile of plants will result in strong impact in pharmaceutical, cosmetic and food industry, as many of the compounds we use are plant secondary metabolites. [Adela M Sánchez-Moreiras, Spain]	We thank the reviewer for the suggestion. However, all these impacts are already implicitly considered in the studies related to crop yield. Change in phenology is considered by models which, when provide results related to change in yield, they have already considered change in phenological pattern. Also, importance of these emissions is not treated in this chapter which is focused especially on impacts between 1.5 to 2°C warming.
305	115	22	115	22	Maybe the huge role that cattle play in GHG production is dealt with elsewhere in Report but, if not, there should be some discussion of the factthat a large decrease in cattle would result in a large decrease in GHG globally to complete the picture of the role of cattle in global warming. [Paul Doyle, Canada]	We thank the reviewer for the suggestion. However, this topic is addressed in another section.
1508	115	22	116	5	What about the indirect effects on ruminants via impacts on grasslands? This is not mentioned at all. [Karen Olsen, Denmark]	The sentence has been reformulated. Now the indirect effect due to changes in feed quality should be clearer
6324	115	22	116	5	What about the indirect effects on ruminants via impacts on grasslands? This is not mentioned at all. [Anne Olhoff, Denmark]	The sentence has been reformulated. Now the indirect effect due to changes in feed quality should be clearer
18432	115	22	116	5	What about the indirect effects on ruminants via impacts on grasslands? This is not mentioned at all. [Andrea TILCHE, Belgium]	The sentence has been reformulated. Now the indirect effect due to changes in feed quality should be clearer
35180	115	22	115	22	Following study should be cited under the section : While analysing the impact of Climate change on services being provided by Rangeland ecosystem Boone et al. (2017) concluded that in 2050 under RCP 8.5 scenario 7.5 to 9.6% decline in Livestock is expected with a serious economic loss of $9.7 to $12.6 billion Citation: Boone, R. B., Conant, R. T., Sircely, J., Thornton, P. K., & Herrero, M. (2017). Climate change impacts on selected global rangeland ecosystem services. Global change biology. [Shaukat Ali, Pakistan]	We thank the reviewer for the suggestion. However the subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. The revised part has been completely removed or strongly modified within the box.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
37148	115	23	115	23	This section is important enough to merit considerable expansion. There is a literature on grass yields e.g. Holden, N. M. and A. J. Brereton, (2002). An assessment of the potential impact of climate change on grass yield in Ireland over the next 100 years, Irish Journal of Agricultural and FoodResearch, 41, 213-226. There is also a literature on livestock impacts e.g. in: Sweeney, J. et al (2008) Climate Change in Ireland: Refining the Impacts, Environmental Protection Agency, EPA STRIVE Programme 2007–2013, Johnstown Castle, Wexford, 163pp. This section also requires to consider combined impacts of temperature and precipitation e.g. earlier grass growth but wetter winter soil conditions in temperate regions such as UK and Ireland. [John Sweeney, Ireland]	We agree with the reviewer. However, due to formatting issues the space available for explaining all interactions more in detail is limited. Therefore, we tried to concentrate as much info as possible using the most recent references, especially those focusing on a warming between 1.5 - 2°C.
44540	115	24	115	42	Spacing and formatting issue in numerous places [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text
8676	115	27	115	27	heat stress is highly detrimental effects' should be 'heat stress is highly detrimental effects' should be 'heat stress has highly detrimental effects' [Robert Shapiro, United States of America]	We thank the reviewer for the comment. The section has been revised and rewritten.
8678	115	28	115	28	2015)and reproduction' should be '2015) and reproduction' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
8680	115	29	115	29	liver fluke,Fox et al.' should be 'liver fluke, Fox et al.' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
22170	115	29		30	Please note that a comma (or otherwise brackets) must be inserted in between of the authors names and the year of publication (six cases in these two lines). [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
8682	115	30	115	30	zoonotic diseasesNjeru et al.' should be 'zoonotic diseases Njeru et al.' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
60536	115	30	115	30	There is a problem with spaces and parentheses in this line. Needs editing. [United States of America]	Accepted- Checked and corrected within the text
60534	115	30	115	31	The conclusion made at the end of the paragraph is not sufficiently explained or cited, and due to the small amount of studies on this issue, it should be clear that there is still not sufficient evidence to apply these conclusions broadly. [United States of America]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. The revised part has been completely removed or strongly modified within the box. However, given the several studies cited in this section, we think that there are many evidences in several studies which highlight the risks of increase detrimental conditions over several ecosystems at 2°C. Despite currently the literature is few (proportionally to other aims), in the next few years many studies will focus on this aspect which, however, seems to be confirmed by the several modelling projections on several ecosystems worldwide.
28400	115	33	113	35	Please add a citation. [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
60538	115	33	115	35	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	We thank the reviewer for the comment. In some parts the information on the risks between 1.5 to 2°C warming is few, therefore we tried to provide as much indication as possible from several studies on Climate Change for providing information about what will likely happen to this sector if warming will increase.
5626	115	40	115	40	Lee et al. (2017)found…should be Lee et al. (2017) found [Sandra CASSOTTA, Denmark]	Accepted- Checked and corrected within the text
8684	115	41	115	41	besides to reduce grass' should be 'besides reducing grass' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10890	115	42	115	42	Change to 'This relation has been found also by Knapp et al….' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
60540	115	42	115	42	Add a space after the Knapp et al. (2014). [United States of America]	Accepted- Checked and corrected within the text
60542	115	45	116	5	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	There are no many studies focused on the target 1.5-2°C warming
61910	116	1	119	60	It is difficult to see the AR5 starting point, the link with earlier parts of the chapter (regional climate change, extremes…), the links with scenarios (SSP in chapter 2 etc). Some references in the assessement are older than AR5, why? The reader is puzzled and does not know what are the key new findings (with an IPCC calibrated language), and where they come from. [Valérie Masson-Delmotte, France]	This subsection has been rewritten. However, there is a huge lack of studies focused on climate change impacts between 1.5 and 2°C warming.
49720	116	2	116	2	The expression of sentence: 'Recent work indicated that heat stress can be responsible for the increase in mortality and economic losses' is not clear, exactly what kind of 'mortality and economic losses' should be specified. [Yinlong XU, China]	We thank the reviewer for the comment. The sentence has been rewritten
16370	116	8	118	2	This section needs a focus on 1.5C versus 2c scenarios. The suggestion that there may be benefits to some fisheries due to some warming needs to be reconciled with the statement earlier in the report that ocean ecosystems services would be at risk from 1.5C warming. The point that fisheries are "headed in the wrong direction" may be true but that is not due to climate change (yet), it is due to overfishing. [Australia]	We thank the reviewer for the comment. About section 3.4.6.4: we partly increased the focus on the overfishing issue as one of the most important cause of detrimental conditions of this sector. However, the focus has to be maintained on the climate change risks between 1.5 to 2°C warming. Literature on this latter aspect is few, therefore we tried to provide as much indication as possible from several studies on Climate Change. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box
1510	116	9		24	Nice! Replicate this structure for crops and livestock [Karen Olsen, Denmark]	We thank reviewer for the comment
6326	116	9		24	Nice! Replicate this structure for crops and livestock [Anne Olhoff, Denmark]	We thank reviewer for the comment
17592	116	9	116	9	Replace "for" with "to". [David Schoeman, Australia]	Accepted- Checked and corrected within the text
18434	116	9		24	Replicate this structure for crops and livestock [Andrea TILCHE, Belgium]	We thank reviewer for the comment
60544	116	9	116	46	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Information related only to 1.5-2°C warming differences are few. Some parts of the text indicate an expected trend by increased warming
56842	116	9	118	2	References on small-scale aquaculture and lake fisheries in Africa that the authors may find useful include: 1) Asiedu, B., Adetola, J. O., & Kissi, I. O. (2017). Aquaculture in troubled climate: Farmers' perception of climate change and their adaptation. Cogent Food & Agriculture, 3(1), 1296400. https://www.cogentoa.com/article/10.1080/23311932.2017.1296400 2) Asiedu, B., Nunoo, F. K. E., & Iddrisu, S. (2017). Prospects and sustainability of aquaculture development in Ghana, West Africa. Cogent Food & Agriculture, 3(1), 1349531. http://www.tandfonline.com/doi/abs/10.1080/23311932.2017.1349531 3) Utete, B., Phiri, C., Mlambo, S. S., Muboko, N. & Fregene, T. B. Fish catches in two eutrophic peri-urban Lakes Chivero and Manyame, Zimbabwe and the confounding influence of climatic factors and catchment dynamics. Cogent Food & Agriculture. https://www.cogentoa.com/article/10.1080/23311932.2018.1435018 4) Utete, B., Phiri, C., Sibonani, C. P., Mlambo, S. S., Muboko, N. & Fregene, T. B. Vulnerability of fisherfolks and their perceptions towards climate change and its impacts on their livelihoods in a peri-urban lake system in Zimbabwe. Environment, Development and Sustainability https://link.springer.com/article/10.1007/s10668-017-0067-x [John Morton, United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the suggestion. Some of these references were added in the text

Comment No	From Page	From Line	To Page	To Line	Comment	Response
34786	116	11	116	12	The sentence says that aquaculture 'is becoming increasingly essential to meet the demand for protein'. This is not essential in a physical sense. In order to be more scientifically accurate the sentence could state 'is becoming an important part of meeting the demand for protein'. [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the comment. The section has been revised and rewritten.
10892	116	12	116	12	Change to 'for protein by a growing global population (FAO, 2016)….' [Franklin Paredes, Brazil]	We thank the reviewer for the comment. The section has been revised and rewritten.
22172	116	12		45	Please review and correct spaces between words (e.g. lines 12, 20, 24, 40,45) [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
17594	116	13	116	13	Are the risks to the fishery or from the fishery. Not clear from the way it's written [David Schoeman, Australia]	We thank the reviewer for the comment. The section has been revised and rewritten.
46786	116	17	116	17	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	We thank the reviewer for the comment. The section has been revised and rewritten.
46788	116	22	116	22	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	We thank the reviewer for the comment. The section has been revised and rewritten.
28402	116	23	116	24	Please add literature which says something about the CC impact that we already experience. [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
5628	116	24	116	24	. ofGattuso et al. (2015). should be of Gattuso et al. (2015). [Sandra CASSOTTA, Denmark]	Accepted- Checked and corrected within the text
8686	116	24	116	24	ofGattuso et al.' should be 'of Gattuso et al.' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10894	116	24	116	24	Change to 'of Gattuso et al. (2015)…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
16372	116	26	116	46	It should be mentioned that management of sustainable fisheries should include consideration of climate change effects on fisheries production, essentially attempting to future-proof fisheries to the impacts of climate change [Australia]	We thank the reviewer for the comment. The sentence has been slightly modified.
229	116	33	116	35	the ongoing rapid degradation of key habitats such as coral reefs . Coral reefs are key oceanic ecosystems, not key habitats. In the coral reefs there are various key habitats, such as lagoons, fore-reef, etc. Change here and in other parts of the report. [Baruch RINKEVICH, Israel]	Accepted-Changed according to reviewer comment
17596	116	33	116	33	Here and elsewhere, Garcia Molinos et al is 2016, I think, not 2015 [David Schoeman, Australia]	We thank the reviewer for the comment. The section has been revised and rewritten.
17598	116	39	116	40	Projections…project scenarios... revise [David Schoeman, Australia]	We thank the reviewer for the comment. The section has been revised and rewritten.
8688	116	40	116	40	increasingly projectscenarios that' should be 'increasingly project scenarios that' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10896	116	40	116	40	Change to 'populations increasingly project scenarios that include shortages…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
41616	116	41			Change "GtC/yr" to "GtC yr-1" [Czech Republic]	Accepted- Checked and corrected within the text
22174	116	44			There are many ways to refer to alien species, but "invasive" is the most used. My suggestion is to replace "nuisance" by "invasive" [LUIS VALDES, Spain]	We thank the reviewer for the comment. The section has been revised and rewritten.
8690	116	49	116	49	very high levels at under RCP 2.6' should be 'very high levels under RCP 2.6' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
31072	117	1	117	1	many countries will have difficulty adapting to these changes needs references, and unclear from the text what scholarship this statement is coming from. This is concerning given there is "high confidence" in the statement. There needs to be scholarship specifically focusing on adaptive capacity to manage changes to make this kind of statement [James FORD, Canada]	We thank the reviewer for the comment. The sentence has been removed
60546	117	3	117	15	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	We thank the reviewer for the comment. About section 3.4.6.4: we partly increased the focus on the overfishing issue as one of the most important cause of detrimental conditions of this sector. In some parts the information on the risks between 1.5 to 2°C warming is few, therefore we tried to provide much indication as possible from several studies on Climate Change for providing information about what will likely happen to this sector if warming will increase.
8692	117	6	117	6	'borealizalation' should be 'borealization' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
8694	117	8	117	8	include warmingas well as' should be 'include warming as well as' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10898	117	8	117	8	Change to 'locations include warming as well as increased light levels…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
22176	117	8		14	Please review and correct spaces between words (e.g. lines 8, 9, 14) [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text
17600	117	9	117	10	Fisheries don't include primary production, so how can they be "undergoing substantial increases in primary production"? [David Schoeman, Australia]	The sentence has been rewritten
44542	117	9	117	9	ice(Cheung et al., 2009). [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text
8696	117	14	117	14	higher rates metabolismthatdecrease concentrations' should be 'higher rates of metabolism that decrease concentrations' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10900	117	14	117	14	Change to 'fueling higher rates metabolism that decrease concentrations of oxygen (Bakun et al.,…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
17602	117	17	117	23	This information is repetitive of material presented earlier [David Schoeman, Australia]	The sentence has been rewritten
41618	117	25			Change "GtC/yr" to "GtC yr-1" [Czech Republic]	Accepted- Checked and corrected within the text
28404	117	29	117	29	Please explain, what is "OA"? [Germany]	Ocean Acidification
17604	117	30	117	31	Awkward wording, revise [David Schoeman, Australia]	Accepted- Checked and corrected within the text
8698	117	32	117	32	governance instrumentssuch as' should be 'governance instruments such as' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10902	117	32	117	32	Change to 'involve governance instruments such as international fisheries agreements that…' [Franklin Paredes, Brazil]	The sentence has been rewritten
44544	117	32	117	44	Spacing issue in 2 places [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text
8700	117	33	117	33	have shofted away' should be 'have shifted away' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
8702	117	36	117	36	andthe reduction' should be 'and the reduction' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10904	117	36	117	36	Change to 'reef habitats, and the reduction of other non-climate change stresses…' [Franklin Paredes, Brazil]	The sentence has been rewritten
41620	117	38			Change "GtC/ha" to "GtC ha-1" [Czech Republic]	Accepted- Checked and corrected within the text
60548	117	41	117	42	This statement could be interpreted to indicate that the Paris Agreement temperature goal is simply 1.5°C of warming, which is not entirely correct. The goal is to hold "the increase in the global average temperature to well below 2°C above preindustrial levels and to pursue efforts to limit the temperature increase to 1.5°C above preindustrial levels" and should be clearly communicated as such in this report. [United States of America]	We thank the reviewer for the comment. However, given that several scientific publications confirm the risks of global warming, it has been retained to be needed a conservative approach focusing on the risks above 1.5°C, considering the 2°C as an already dangerous threshold for many ecosystems and several worldwide areas.
46790	117	47	117	47	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The document has been revised and reworded according to the formatting required

Comment No	From Page	From Line	To Page	To Line	Comment	Response
12926	118	5	119	39	it might be interesting to add a mention about food security in the Arctic; particularly among indigenous populations who at least partially rely for food on specific traditional animal and plant species, which as mentioned in previous sections, are experiencing important phenological changes and changes in abundance and range (e.g. declining caribou/reindeer populations). These changes in addition to changes in weather and environmental conditions are causing and are expected to cause difficulties in the procurement of traditional food sources and thus have an impact on food security. [Marie-Jeanne S. Royer, Canada]	The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. Anyway, some of the comments can be found in subsection 3.4.6.4 (Fisheries and aquaculture), where change in ocean temperature leads to modifications within ecosystems and, in turn, to food security along the areas affected by these changes.
18436	118	5	118	5	We propose to replace "Food security" with "Food and nutrition security"; a more comprehensive and inclusive definition in line with SDG 2 [Andrea TILCHE, Belgium]	We thank reviewer for the suggestion. The title has been now changed
28406	118	5	119	39	The introductory paragraph lays out the factors influencing food security (under climate change), but the text does not follow this structure (or any apparent structure): It may be helpful to cluster evidence along the list provided in the intro, e.g. have a section on adaptation to climate change and food security. Also, lines 43-47 should be lifted to the introductory paragraph. [Germany]	We thank the reviewer for the comment. The whole section has been revised and rewritten.
1512	118	6			Don't forget food availability, utilization and stability when reflecting on food security (and don't forget to mention nutrition as it's not all about calories) [Karen Olsen, Denmark]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box, which should now be more complete
6328	118	6			Don't forget food availability, utilization and stability when reflecting on food security (and don't forget to mention nutrition as it's not all about calories) [Anne Olhoff, Denmark]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box, which should now be more complete
18438	118	6			Don't forget food availability, utilization and stability when reflecting on food security (and don't forget to mention nutrition as it's not all about calories) [Andrea TILCHE, Belgium]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box, which should now be more complete
28408	118	6	118	6	Please mention also "nutritional content" as an element of food security which is changing with CC. [Germany]	We thank reviewer for the suggestion. The title has been now changed
31076	118	6	118	7	food security is a function of access, availability and qaulity (as per FAO). Food systems are comprised of production, processing, distribution, consumption. The first sentence here is thus confusing, conflating food security with food systems [James FORD, Canada]	We thank reviewer for the suggestion. The sentence has now been changed
40062	118	6		7	Climate change is expected to affect all food security dimensions as defined in the World Food Summit of 1996. Climate change affects food availability through its increasingly adverse impacts on crop yields, fish stocks and animal health and productivity, especially in sub-Saharan Africa and South Asia, where most of today's food insecure live. It limits access to food through negative impacts on rural incomes and livelihoods (FAO, 2016). Climate-induced supply variability and periodic supply shortfalls in some regions would lead to increases in food prices, while increased climate variability would result in increased food price volatility. Climate variability would also affect the stability of rural household incomes in areas already subject to high variability in yields (Thornton et al., 2014). Changes in the utilization of food will impact the nutrition status of the poor and vulnerable in a number of ways, including through the development of pathogens, increased water scarcity, decreased water quality and hygiene habits with implications on health such as the increased incidence of diarrhea in some regions (FAO, 2016). Food safety may be affected by an increase in food-borne pathogens or toxic components in food. For example, higher temperatures and humidity could increase the risk of mycotoxin contamination of stored cereals and pulses (Paterson and Lim, 2010). Climate change is also expected to affect the utilization of food through changes in the nutrition status of crops (expected to become les nutritious due to higher C02 concentration. Finally, climate variability and a higher frequency and intensity of extreme events will affect the stability of food availability, access and utilization through changes in seasonality, more pronounced fluctuations in ecosystem productivity, increased supply risks and reduced supply predictability. Cited references: FAO, 2016. The State of Food and Agriculture: Climate Change, Agriculture and Food Security. The Food and Agriculture Organization of the United Nations, Rome 2016. Paterson, R. & Lim, N. 2010. How will climate change affect mycotoxins in food? Food Research International, 43: 1902–1914. Thornton P., Ericksen P.J., Herrero M. & Challinor A.J. 2014. Climate variability and vulnerability to climate change: a review. Global change biology, 20:3313–3328. [Aziz ELBEHRI, Italy]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. However, the suggested references have been added into the text (Cross Chapter Box).

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40064	118	7		12	Food trade deserves a fuller treatment in 15SR (largely absebt in the current draft) since trade can play a critical role both for adaptation and for mitigation. On the adaptation side, without barriers, trade would contribute significantly to lower global costs of food [Federico, 2005] and can ensure that food availability will not be jeopardized for the next century or so under climate change [Julia and Duchin, 2013]. Trade can also stimulate investments to improve agricultural technologies in low-yielding countries and upgrade their production capacity which in turn can moderate the exploitation of land and water resources within sustainable limits (Kastner et al., 2011). Moreover, trade can significantly moderate the rise in global malnutrition count due to climate change [Baldos and Hertel, 2015). There is a strong case for open trade as an essential adaptation and mitigation instrument as well as a development tool. And favorable trade policy is an important pre-requisite. Within agriculture, an open trade regime can play a stabilizing role for prices and supplies and provide alternative food options for negatively affected regions by changing conditions or by finding regions where food can be produced more efficiently (both concerning environmental and economic costs). Under increased frequency of extreme events, trade can play a significant role in smoothing out food supplies from surplus regions to adversely impacted regions that may experience short or medium term disruptions in transportation, supply chains and logistics [Earley, 2009]. Countries facing water scarcity, such as from North Africa and the Middle East and South East Asia are expected to rely even more on trade to meet their growing domestic demand, as global warming is expected to exacerbate water scarcity and put limits on irrigation possibilities (Gilmont, 2015; scheierling 2016). Climate change, by weakening existing production patterns in some areas and creating new production opportunities in others, will drive the growth of new markets, including global value chains supported by trade. Prolonged droughts, severe floods or rising sea levels and other extreme weather events may render production networks uneconomical, damage infrastructure or disrupted transport networks may seriously undermine existing export networks, especially from countries with limited adaptive capacity (Curtis, 2009). However, despite the ability for trade networks to efficiently move agricultural products from surplus to deficit regions, the unequal distribution of climate impacts may skew comparative advantages in favour of those regions with higher access to markets, services, and therefore stronger adaptive capacities, leading to market fragmentation and widening the divide between developed and developing nations [De Schutter, 2009). Cited references: Baldos, U. & T. Hertel. 2015. The role of international trade in managing food security risks from climate change. Food Security, 7 (2): 275-290. Curtis, F. 2009. Peak globalization: Climate change, oil depletion and global trade. Ecological Economics, 69: 427–434. De Schutter, O. 2009. International Trade in Agriculture and the Right to Food. Occasional paper – November 2009. Geneva, Friedrich-Ebert-Stiftung. Earley, J. 2009. Climate change, agriculture and international trade: Potential conflicts and opportunities. Biores Volume 3 - Number 3 Federico, G., 2005. Feeding the World: An Economic History of Agriculture, 1800–2000. Princeton University Press, Princeton. Gilmont, M. 2015. Water resource decoupling in the MENA through food trade as a mechanism for circumventing national water scarcity. Food Security, 7: 1113-1131. Julia, R. & F. Duchin. 2013. Land Use Change and Global Adaptations to Climate Change. Sustainability, 5: 5442-5459. Kastner, T., K. Erb & S. Nonhebel. 2011. International wood trade and forest change: A global analysis. Global Environmental Change, 21: 947–956. Scheierling, S. M., D.O. Treguer. 2016. Investing in adaptation: the challenge of responding to water scarcity in irrigated agriculture. Economic Review 101(Special Issue):75-100. [Aziz ELBEHRI, Italy]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. The revised part has been completely removed or strongly modified within the box.
8704	118	8	118	8	quantification ofthe resulting' should be 'quantification of the resulting' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10906	118	8	118	8	Change to 'but quantification of the resulting impacts on food security is…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
28410	118	9	118	28	The role of trade is not mentioned in this paragraph, but seems to be included in all agro-economic modelling studies, so please consider to mention it here. [Germany]	The document has been revised. The trade aspects were moved in the Cross Chapter Box
30506	118	9	118	10	As there is a lot of references to CO2 fertilisation, maybe it would be relevant to add a box or a small section describing it. [France]	We thank the reviewer for the suggestion. However, due to formatting issues, the space available for explaining all CO2 interactions more in detail (also as table) and consequences on crop production is limited.
12096	118	11	118	11	uncertainties in the adaptation which may be implemented - uncertainties in the effectiveness or what the strategy will actually be? Be specific [United Kingdom (of Great Britain and Northern Ireland)]	The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. The reviewed sentence has been changed.
62076	118	12	118	15	In this sub section, it's important to highlight that some countries will be more affected by drought than others in the same regions . As exemple, In Mediterranean basin, North African (NA) countries (notably Morocco, Algeria, and Tunisia) are projected to become global hotspots for drought by the end of the 21st century. Jobbins and Henley (2015) emphasise that most people in NA will be affected by climate impacts on their income and health, livelihoods, food price volatility, and the potential for climate extremes such as floods and storms to disrupt food supply chains. see paper linked: Jobbins, G., & Henley, G. (2015) Food in an uncertain future: the impacts of climate change on food security and nutrition in the Middle East and North Africa, Overseas Development Institute, London / World Food Programme, Rome. http://documents.wfp.org/stellent/groups/public/documents/communications/wfp279986.pdf [Rachid MOUSSADEK, Morocco]	We thank the reviewer for the comment. We improved the focus on Climate Change risks on countries placed in the warmer areas (i.e. Mediterranean, Africa etc). However, due to formatting issues, we cannot focus too much on a specific area as well as to include all possible references.
8706	118	13	118	13	changestothe supply' should be 'changes to the supply' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text
10908	118	13	118	13	Change to 'changes to the supply of foods such as wheat,maize, and…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text
44546	118	13	118	32	Spacing issue in 4 places [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text
28412	118	15	118	15	Please clarify whether by "Changes in temperature and precipitation, irrespective of climate change" is meant: "Variations in temperature and precipitation" [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten.
28414	118	15	118	27	Please refer to the World Bank report on poverty and CC (https://openknowledge.worldbank.org/handle/10986/22787) that contains important information. Please include also information on food price increases and literature suggestions from https://www.pik-potsdam.de/research/publications/pikreports/summary-report-no-128. Another article that could be interesting is Wiebke et al. : http://iopscience.iop.org/article/10.1088/1748-9326/10/8/085010. Please look also at the newest publications of AgMIP. [Germany]	We thank the reviewer for the comment. The section has been revised and rewritten. Several references have been added. However, due to formatting issues, not all references can be added.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
30508	118	15	118	19	We agree with the results/terminology that you use (CC alone without CO2 effect would lead to increased in food prices). But it may be misleading (contradictory) for a non-specialized reader. [France]	We thank the reviewer for the comment. The section has been revised and rewritten. However, some technicism needs to remain due to the officiality of the document. At the end the glossary can be found by non-expert readers
32838	118	15	118	16	What does it mean to talk about changes in temperature and precipitation that are 'irrespective of climate change'? Is there supposed to be some other source of changes in temperature and precipitation? [Drew SHINDELL, United States of America]	We thank the reviewer for the comment. The section has been revised and rewritten.
60550	118	15	118	37	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	We thank reviewer for the comment. The sentences have been rewritten
32836	118	17	118	19	The phrasing 'over and above' is a bit strange, but implies to me that all these factors are included (CO2, ozone, pests and disease). However, I have been looking for some time at this literature and haven't found cases that actually include all these factors, and this sentence does not give any references. The next sentence goes on to Lobell et al's Science paper, which for example did not include ozone or pests and disease. The later citations seem to go on to another topic. If this is from the AR5, that shoud be made clearer but it's not obvious to me how you could get these results from the AR5 other than linearly summing all the separate results reported there (if that was done it should be stated: see my related comment regarding page 115). [Drew SHINDELL, United States of America]	The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. The sentence has been deleted as well as the related reference
113	118	19	118	21	Lobell et al. (2011) does not analyze the price of food commodities, but examines the impacts of temperature and precipitation trends on crop production and yields. Please replace Lobell et al. (2011) by appropriate literature or appropriately edit the text. [Toshichika Iizumi, Japan]	We thank the reviewer for the suggestion. The reference, now found in the Cross Chapter box, has been deleted.
13122	118	23	118	26	Delete the text "Concerning bioenergy crops, the increased demand due to increased use in biofuel production influenced both energy policy and oil price fluctuations, thus leading crop price fluctuations (Mueller et al., 2011; Roberts and Schlenker, 2013; Wright, 2011).". [Eleni Kaditi, Austria]	Accepted- Deleted as suggested by reviewer
17606	118	29	118	29	This opening statement requires support from the literature. Try Golden, C.D. et al. (2016). Fall in fish catch threatens human health. Nature, 534(7607), pp.317-320. [David Schoeman, Australia]	We thank the reviewer for the comment. The section has been revised and rewritten. Several references have been added. However, due to formatting issues, not all references can be added.
8708	119	2	119	3	southern Africa, will cause drier mean conditions and higher risk of consecutive drought years the additional 0.5°C warming from 1.5°C to 2°C.' should be 'southern Africa, the additional 0.5°C warming from 1.5°C to 2°C will cause drier mean conditions and higher risk of consecutive drought years . [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text within the text
8710	119	9	119	9	reportsthat the' should be 'reports that the' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text within the text
10910	119	9	119	9	Change to 'von Lampe et al. (2014) reports that the average annual rate of change of…' [Franklin Paredes, Brazil]	This part has been deleted
30510	119	9	119	12	There is already a discussion about prices in the previous page. Please group those two sections. [France]	Modified as suggested
44548	119	9	119	39	under 4.0°C (RCP8.5)compared with a [Rita Man Sze Yu, China]	Accepted- Checked and corrected within the text within the text
49722	119	9	119	12	In this sentence, in line 9-10, the description like 'Under no carbon fertilization effect, van Lampe et al. (2014) reports that the average annual rate of change of real global producer prices for agricultural prices for agricultural products lies between -0.4% and +0.7% between 2005 and 2050' is easy to confuse the reader, the 1st point is that the literature is published in year 2014, while the time-slice for the conclusion is 2005-2050, it is easily to be confused it is a projection or a statistical results? The 2nd point is it is stated as average annual rate is between -04% and +0.7%, it is easily to be confused to get the general trend, if every year is -0.4%, the price would drop a lot, or vice versa for +0.7%. While in the following expression that 'whilst Nelson et al. (2014a) argued that differences in price impacts of climate change are accompanied by differences in land use change', it is almost a common knowledge. [Yinlong XU, China]	The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box. The revised part has been completely removed or strongly modified within the box.
8712	119	12	119	12	also reportedhigher prices' should be 'also reported higher prices' [Robert Shapiro, United States of America]	This part has been deleted
10912	119	12	119	12	Change to 'Nelson et al. (2014a) also reported higher prices on average for almost all…' [Franklin Paredes, Brazil]	This part has been deleted
60552	119	12	119	12	... differences in assumptions on land use change among the ten global economic models used in their study. Add text for clarity and completeness. [United States of America]	We thank the reviewer for the comment. The whole section has been revised and rewritten.
49724	119	17	119	19	The sentence of 'By contast……and warmer temperatures' should be followed with the above sentence? If it is, it should be clearly indicated 'in the West Australian Wheatbelt'. [Yinlong XU, China]	We thank the reviewer for the comment. The whole section has been revised and rewritten.
10914	119	18	119	18	Change to 'farm profit can be positive as a result of the joint…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text within the text
30512	119	19	119	22	Could you explain why? this sounds contradictory with previous results [France]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box
8714	119	23	119	23	economic condition for assessing' should be economic conditions for assessing [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text within the text
22178	119	26		39	Please review and correct spaces between words (e.g. lines 26, 30, 39) [LUIS VALDES, Spain]	Accepted- Checked and corrected within the text within the text
8716	119	27	119	27	impact on food' should be 'impact food' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text within the text
8718	119	30	119	30	countries whereagriculture is' should be 'countries where agriculture is' [Robert Shapiro, United States of America]	Accepted- Checked and corrected within the text within the text
10916	119	30	119	30	Change to 'In countries where agriculture is the major source of livelihood…' [Franklin Paredes, Brazil]	Accepted- Checked and corrected within the text within the text
35182	119	30	119	30	The spacing is missing between the words "whereagriculture" [Shaukat Ali, Pakistan]	Accepted- Checked and corrected within the text within the text
56844	119	30	119	39	The role of agricultural research and extension services in generating and disseminating agricultural innovations for climate adaptation, and current constraints upon them, are relevant here. This is reviewed with research findings from four African countries in Morton, J. “Climate change and African agriculture: unlocking the potential of research and advisory services” in F. Nunan (ed.) Making Climate Compatible Development Happen, Routledge (2017) (declaration of interest: I am the author). [John Morton, United Kingdom (of Great Britain and Northern Ireland)]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box
60554	119	30	119	39	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter-Box
18440	119	32	119	34	The sentence seems to imply absolute certainty that climate change will have negative impacts on yields, yet this is not reflected in the broader review of the literature under section 3.4.6.2 Crop production - where both positive and negative impacts are identified. [Andrea TILCHE, Belgium]	We thank the reviewer for the comment. The subsection of food security has been deleted. Only few parts were transferred and included in the Cross Chapter Box . We rewrote and added some specifics on both aspects

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6330	121				The chapter contains quite strong evidence and indications that RCP2.6, if not necessarily 1.5 degrees, is the only scenario that prevents major destruction of ecosystems, ice caps, etc.This should be synthesised and picked up especially in chapter 4, which currently does not seem to take chapter 3 findings much into account. As is the case for Chapter 4, Chapter 3 illustrates the difficulties in accomplishing what the IPCC has been tasked with: in most cases, the underlying literature remains insufficient to make a meaningful distinction between 1.5 and 2 degrees. This often contrasts with the headings (indicating that the section looks at 1.5 versus 2 degrees). Either the headings could be revised or the difficulty and it's implication for the content of the given subsections could be outlined more clearly. It would also be beneficial to construct a nice figure providing an overview of what can be said regarding differences between 1.5 and 2 degrees. Figure 3.21 begins to do this, but could be 'upgraded' / expanded to summarise all key findings. [Anne Olhoff, Denmark]	We thank the reviewer for the suggestion. The Chapter 3 has been completely revised and many sentences were changed or deleted.
6332	121				The text needs proofreading, there are many missing spaces. misspellings, references that are incomplete, etc. The comments below do not include corrections to these as there are simply too many. The storyline can be strengthened and key findings summarised and highlighted further. There are also numerous repetition across sections, which should be minimised. [Anne Olhoff, Denmark]	Accepted – text was revised and proofread. Repetition was eliminated, and storyline improved.
18448	121				The text needs proofreading, there are many missing spaces. misspellings, references that are incomplete, etc. The comments below do not include corrections to these as there are simply too many. The storyline can be strengthened and key findings summarised and highlighted further. There are also numerous repetition across sections, which should be minimised. [Andrea TILCHE, Belgium]	Accepted – text was revised and proofread. Repetition was eliminated, and storyline improved.
18446	121				The chapter contains quite strong evidence and indications that RCP2.6, if not necessarily 1.5 degrees, is the only scenario that prevents major destruction of ecosystems, ice caps, etc.This should be synthesised and picked up especially in chapter 4, which currently does not seem to take chapter 3 findings much into account. As is the case for Chapter 4, Chapter 3 illustrates the difficulties in accomplishing what the IPCC has been tasked with: in most cases, the underlying literature remains insufficient to make a meaningful distinction between 1.5 and 2 degrees. This often contrasts with the headings (indicating that the section looks at 1.5 versus 2 degrees). Either the headings could be revised or the difficulty and it's implication for the content of the given subsections could be outlined more clearly. It would also be beneficial to construct a nice figure providing an overview of what can be said regarding differences between 1.5 and 2 degrees. Figure 3.21 begins to do this, but could be 'upgraded' / expanded to summarise all key findings. [Andrea TILCHE, Belgium]	We thank the reviewer for the suggestion. The Chapter 3 has been completely revised and many sentences were changed or deleted.
47272	121		121		Astrom et al (2013) Cited three times with completely identical statements on Page 121, Page 146 and Page 156 [Sarah Connors, France]	Rejected – Two citations for risk and one for adaptation
139	121	1	121	1	in my opinion there is one important factor missing in the report that is the influence of warming on 'special' impacts on human health that are the worsening of Altzheimer desease. This is particularly important because the impact of the desease is a 'social impact' not only individual. Thus I suggest to include at least one sentence highlighting this issue. References: Bioimpacts. 2014; 4(4): 167–170. Sci Adv. 2017 May; 3(5): e1601555. Relative incidences https://www.niehs.nih.gov/research/supported/translational/peph/resources/assets/docs/climate_change_and_vulnerability_in_the_elderly_508.pdf [teodoro georgiadis, Italy]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
60556	121	1	125	51	Criteria for inclusion/exclusion of health risks is unclear. For example, a variety of potential risks are not discussed (e.g., dust-borne meningitis, non-Lyme diseases such as Crimea-Congo Hemorrhagic Fever carried by ticks, cholera or harmful algal bloom-related diseases besides Baltic Vibrio, etc.). This may be rightly due to lack of evidence for differences in impacts at 1.5 vs 2°C, but chapeau language explaining how the authors selected the risks to profile would be useful. [United States of America]	Accepted – text revised: clarification was added
60558	121	1	125	51	Section 3.4.7 is fairly limited and could be made more informative. It does not even mention the full array of potential health impacts that have been observed, especially omitting mental health impacts and the health consequences of extreme events as mediated through health facility failure (e.g., morbidity and mortality associated with Superstorm Sandy's impacts on medical centers and nursing homes, a storm whose flooding has been assessed for attribution to climate change). There is no mention of the potential for thresholds between 1.5 and 2°C for some areas, only very vague description of increases with qualifying language about "complex regional patterns" that is never clearly defined. The next section quantifies six types of urban risks, all of which have implications for human health. The next section discusses critical implications of those urban risks, including migration and conflict, which are not mentioned in the health section. The report needs to ensure that there is substantial cross-walking between the health and urban section, and probably many others. As written, the health section is overly narrow in scope. [United States of America]	Rejected – the Human Health section focuses on the projected health risks at 1.5°C / 2°C warming. Projections of thresholds are not available.
5336	121	3	121	31	Suggested to adding other diseases that impacted by climate change, such as Malaria and Dengue Fever. Even though already mentioned on page 124-125 it is still important to highlight in this section. The references below could be used. Kumar, V. (2015). Role of Indigenous Knowledge in Climate Change Adaptation Strategies: A Study with Special Reference to North-Western India. Journal of Geography and Natural Disasters, 5(1), 1–5. http://doi.org/10.4172/2167-0587.1000131 Morin, C. W., Comrie, A. C., & Ernst, K. (2013). Climate and dengue transmission: Evidence and implications. Environmental Health Perspectives. http://doi.org/10.1289/ehp.1306556 Naess, L. O. (2013). The role of local knowledge in adaptation to climate change. Wiley Interdisciplinary Reviews: Climate Change, 4(2), 99–106. http://doi.org/10.1002/wcc.204 [Sulistyawati Sulistyawati, Indonesia]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
60560	121	8	121	18	It should be further elaborated how these observed and detected changes specifically relate to human health, otherwise this section should be removed. [United States of America]	Taken into account – section removed
46884	121	16	121	16	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted – Text was revised with the suggested edit
60562	121	20	121	31	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.
18442	121	21	121	21	Replacing "food security" with "food and nutrition security" is even more relevant in this human health context [Andrea TILCHE, Belgium]	Accepted – text was revised.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16374	121	24	24	31	Cramer concluded that climate change has contributed to increased heat-related mortality in recent decades in Australia… (medium confidence)'. Cramer et al (2014) cite 'Bennett, C.M., K.G. Dear, and A. McMichael, 2013: Shifts in the seasonal distribution of deaths in Australia, 1968-2007. International Journal of Biometeorology, (April), doi:10.1007/s00484-013-0663-x.as their source. However, in that study, Bennett et al write "the change has so far been driven more by reduced winter mortality than by increased summer mortality", - source: 'Winter's deathly grip slips in Australia', http://www.abc.net.au/science/articles/2013/05/31/3771058.htm. Suggest consider revising the level of confidence associated with the initial statement. [Australia]	Not applicable – section no longer included in the chapter
54378	121	26	121	29	Not only CO2 but climate change itself will affect certain pollen loads by extending the pollen season and the favorable habitat area. The example of ragweed is quite clear (Ziska, L. H. et al. Recent warming by latitude associated with increased length of ragweed pollen season in central North America. Proc. Natl Acad. Sci. USA,108, 4248 4251 (2011); (Hamaoui-Laguel et al., 2015, Effects of climate change and seed dispersal on airborne ragweed pollen loads in Europe,. Nature Climate Change, 5, 766-U186), and the impact of climate change on health has been estimated (Lake et al., 2016: Climate change and future pollen allergy in Europe. Environ. Health. Persp., 125(3), 385.) [Robert Vautard, France]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
13952	121	34	125	44	I wonder about he organization, emphasis in these two sections. In the first section there is an underlined heading of lyme disease in Canada (very specific!), and the second section, more general topics, including air quality, but then back to specific diseases (Malaria). I know lyme disease is bad im canada, but it does it really rate its own section equal to malaria? I understand one is detected impacts and the other projections but maybe reduce the detail in the underlined section in the first section? just say diseases or just make these paragraphs? [Natalie MAHOWALD, United States of America]	Accepted – Section 3.4.7.1 was removed; sections 3.4.7.2 and 3.4.7.3 were edited for clarity and conciseness.
60564	121	34	122	28	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.
40326	121	35	121	43	Major killers; such as diarrheal diseases, malnutrition, malaria and dengue fever, are high climate-sensitive health problem, and expected to be worst with the climate changes (Reference: WHO Fact sheet No. 266 (2012). Climate change and health. World Health Organization. http//:www.who.int/mediacentre/factsheets/fs266/en/). [Amal Hussein, Egypt]	Noted
40328	121	35	121	43	In Egypt, it is expected that climate change effects the spread and prevalence of mosquito-borne diseases (malaria and lymphatic filariasis), fly-borne diseases (leishmaniasis and mechanically transmitted parasites), and snail-borne parasitic infections (schistosomiasis and fascioliasis) (Reference: Lotfy WM (2014). Climate change and epidemiology of human parasitosis in Egypt: A review. J Adv Res.; 5(6): 607–613). [Amal Hussein, Egypt]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
22180	121	37			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
1262	121	38	121	38	(e.g., Smith et al. 2014, add Frei 2017*) Frei Th. Global change, heat waves and mortality rates. Prävention und Rehabilitation 29/2: 55-61, 2017. [Thomas Frei, Switzerland]	Not applicable – section was removed.
22182	121	38			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
22184	121	41			insert space between "Europe(Ebi" [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44550	121	41	121	41	Europe(Ebi et al., 2017 [Rita Man Sze Yu, China]	Accepted – text was revised with the suggested edit.
6334	121	45	122	28	This could be taken out and the preceeding paragraph expanded a little instead. It is not clear how much value these subsections add. [Anne Olhoff, Denmark]	Accepted – text was removed.
16376	121	45	121	50	There are a number of studies conducted in Australia and in NSW about the heatwave effects due to climate change (Bambrick, H et al (2011) [Australia]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
18444	121	45	122	28	This could be taken out and the preceeding paragraph expanded a little instead. It is not clear how much value these subsections add. [Andrea TILCHE, Belgium]	Accepted – text was removed.
43620	121	45	121	50	There are many regional studies to support the impact of high air temperature on human diseases such as cardiovascular and respiratory problems. Examples in Korea include Lim et al. (2012) Effects of diurnal temperature range on cardiovascular and respiratory hospital admissions in Korea, Science of the Total Environment, 15, 417-418. Kim et al. (2010). High Temperature, Heat Index, and Mortality in 6 Major Cities in South Korea, Archives of Environmental & Occupational Health, 61, 265-270 [Jinkyu Hong, Republic of Korea]	Not applicable – section was removed.
1264	121	50	212	50	It should be added, that heatwaves not only increase mortality, but as well also morbidity as have been shown in Switzerland (Manser et al. 2013*). Manser C.N., M. Paul, G. Rogler, L. Held and Th. Frei: Heat waves, incidence of infectious gastroenteritis and relapse rates of inflammatory bowel disease: a retrospective controlled observational study. The American Journal of Gastroenterology 108: 1480-1485, 2013. [Thomas Frei, Switzerland]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
17164	121	50	12	50	The reference by Astrom et al. 2013 seems like a paper on morbidity, not mortality. [Yasushi Honda, Japan]	Taken into account – text revised: morbidity was added
22186	122	1		28	I wonder if these two elements (Lyme disease in Canada and Vibrio emergence in the Baltic Sea) should be a text box following the narrative of lines 32-42 in page 125. [LUIS VALDES, Spain]	Taken into account – text revised: details were removed
43224	122	1	122	28	These sections are perhaps a bit long given the somewhat limited geographical scope (compared to other impacts mentioned further down the section) [Edward Byers, Austria]	Taken into account – text revised: details were removed
40330	122	29	122	29	Snails Bulinus and Biomphalaria moved from their habitats in Upper Egypt to avoid extreme temperatures resulting in an increase in Schistosomamansoni and concomitant decrease in Schistosomahaematobium prevalence from the Nile delta into Upper Egypt. S. mansoni has almost totally replaced S. haematobium in Lower Egypt, and is spreading into Fayyoum in Upper Egypt (Reference: Ahmed, S.A., Saad-Hussein A, El Feel, A., Hamed, M.A.(2014). Time series trend of Bilharzial bladder cancer in Egypt and its relation to climate change: A study from 1995-2005. International Journal of Pharmaceutical and Clinical Research; 6(1): 46-53). [Amal Hussein, Egypt]	Rejected – literature recommendation does not provide projections specific to 1.5°C / 2°C warming

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40332	122	29	122	29	Studies suggest that climate change could expose an additional 2 billion people to dengue transmission by the 2080s, the presence of Aedes mosquito and endemicity of dengue fever in the neighboring regional countries must be in mind of the Authorities in the Ministry of Health in Egypt (Reference: WHO Fact sheet No. 266 (2012). Climate change and health. World Health Organization. http//:www.who.int/mediacentre/factsheets/fs266/en/). [Amal Hussein, Egypt]	Rejected – literature recommendation (fact sheet) is no longer available
60566	122	32	122	46	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.
5932	123	3	123	27	In relation to the temperature-related mortality, the research collected shows that the effect of heat is increasing and the impact of cold is decreasing, when exits different studies that show the contrary. It is understood that only the negative impact of heat is stressed, but at least these other studies should be referenced in relation to the increase in cold mortality. Gasparrani et al. 2015 (already referenced); (Díaz et al, 2015) Díaz J, Carmona R, Mirón IJ, Ortiz C, Linares C. Comparison of the effects of extreme temperatures on daily mortality in Madrid (Spain), by age group: the need for a cold wave prevention plan. Environmental Research, 2015; 143:186-191; (Linares et al, 2015) Linares C, Díaz J, Tobias A, Carmona R, Mirón IJ. Impact of heat and cold waves on circulatory-cause and respiratory-cause mortality in Spain: 1975-2008. Stochastic Environmental Research and Risk Assessment. 2015; 29:2037-2046. [Julio Diaz, Spain]	Taken into account – however, as requested by the UNFCCC, the text focuses on the health risks at warming of 1.5°C and 2°C.
5942	123	3	123	17	By considering only the thermal extremes impact on mortality (especially from heat). The completely impact of heat and cold waves on health is underestimated. The inclusion of studies on the impact on morbidity and susceptible groups, show that the affected population is much greater than the collected by mortality. That is why pregnant women are included as a comment above. [Cristina Linares, Spain]	Taken into account – however, as requested by the UNFCCC, the text focuses on the health risks at warming of 1.5°C and 2°C.
6336	123	3	123	27	Can anything be said about the overall magnitude? i.e. how much temperature related mortality is reduced by moving from 2 to 1.5 degrees? [Anne Olhoff, Denmark]	Rejected – Diversity of health outcomes, methods, assumptions, and modeling choices preclude quantifying the difference.
16378	123	3	123	17	There are a number of studies conducted in Australia and in NSW about the temperature-relatated mortality due to climate change (Kjellstrom, T. and Weaver, H. 2009). [Australia]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
17166	123	3	123	6	Temperature-mortality association is now evaluated in non-linear fashion, and the reference cited here (Gasparrini et al 2015 and Hales et al 2014) both used distributed lagnon-linear models, i.e., not "linear". The reference by Rocklov and Ebi address the linearlity beyond the data range, and the sentence need to be described so. [Yasushi Honda, Japan]	Taken into account – text revised: edited for clarity
18450	123	3	123	27	Can anything be said about the overall magnitude? i.e. how much temperature related mortality is reduced by moving from 2 to 1.5 degrees? [Andrea TILCHE, Belgium]	Rejected – Diversity of health outcomes, methods, assumptions, and modeling choices preclude quantifying the difference.
17168	123	6	123	7	Incomplete sentence (from "Therefore" to "relationships"). [Yasushi Honda, Japan]	Accepted – sentence was revised
35976	123	6	123	6	Add 'are' after quantifications [India]	Accepted – sentence was revised
584	123	7	123	14	See also Hsiang et al 2017 [Robert Koppu, United States of America]	Rejected – literature recommendation does not provide projections specific to 1.5°C / 2°C warming
17172	123	14	123	17	These two statement need some references. [Yasushi Honda, Japan]	Rejected – cited in previous sentence
5938	123	16	123	17	It is also important the effect of heat waves on premature births (Arroyo V et al.2016), studies have shown the effect of high temperatures can advance the birth, therefore pregnant women is population especially susceptible to heat waves impact. Arroyo V, Díaz J, Ortíz C, Carmona R, Sáez M, Linares C. Short term effect of air pollution, noise and heat waves on preterm births in Madrid (Spain). Environmental Research 2016; 145:162-168. [Cristina Linares, Spain]	Accepted – literature recommendation was integrated into the text
5934	123	16	123	17	Having a neurodegenerative disorder is one of the factors at individual level associated with an increased risk of morbidity and mortality when a heat wave occurs. For example, in Parkinson's disease, its susceptibility comes either through a biological mechanism such as the deficit of dopamine related to hyperthermia in heat waves or, from the effects of dyshidrosis that the use of neuroleptics drugs have (Linares C et al. 2017). Results have also been found for the increase in emergency hospital admissions from dementia (Linares C et al, 2017) and Alzheimer's disease (Culqui DR et al. 2017). Linares C, Culqui DR, Carmona R, Ortiz C, Díaz J. Short-term association between environmental factors and hospital admissions due to dementia in Madrid. Environment Research 2017; 152: 214-220. Linares C, Martínez-Martín P, Rodríguez-Blazquez C, MJ Forjaz, Quiroga B, Ortiz C, Carmona R, Díaz J. Short-term association between road traffic noise and demand for health care generated by Parkinson's disease in Madrid. Gaceta Sanitaria. 2017. Culqui DR, Linares C, Ortiz C, Carmona R, Díaz J. Short term association between environmental factors and emergency hospital admissions due to Alzheimer's disease in Madrid. Science of the Total Environment 2017. 592: 451-457. [Julio Diaz, Spain]	Taken into account – chronic diseases are already included in section 3.4.7.1
1592	123	18	123	20	Climate change…could…intensify the formation of near-surface ozone Please cite the following two studies, which are the first and still only studies to show the direct cause-effect relationship between carbon dioxide and ozone mortality through its feedback to climate (namely both temperature and water vapor) Jacobson, M.Z, On the causal link between carbon dioxide and air pollution mortality, Geophysical Research Letters, 35, L03809, doi:10.1029/2007GL031101, 2008 and Jacobson, M.Z., The enhancement of local air pollution by urban CO2 domes, Environ. Sci. Technol., 44, 2497-2502, doi:10.1021/es903018m, 2010. These studies also examined the link between CO2 and particulate matter mortality. [Mark Jacobson, United States of America]	Not applicable – section no longer included in the chapter
1838	123	19	123	21	Instead of using the term 'outweigh', it would be better to say that heat-related mortality will be higher than cold-related mortality. [Greece]	Accepted – text revised
17174	123	19	123	27	This paragraph needs a statement on cold risk; the risk may become higher along with the warming. See Chung et al. Am J Epi 2017. Other evidence that colder areas have lower cold risk than the warmer areas also supports this idea. [Yasushi Honda, Japan]	Rejected – literature recommendation does not provide projections specific to 1.5°C / 2°C warming
40516	123	19	123	23	Research that has found decreased cold-related mortality have been questioned. For example, a recent paper in Climatic Change (Huber et al. 2017) states that "Here, we reanalyse the data presented by Martens (1998), with the objective to test the robustness of one of Martens' major conclusions, namely that '[in most cities] global climate change is likely to lead to a reduction in mortality rates due to decreasing winter mortality'. Our reanalysis reveals a number of questionable assumptions underlying Martens' results, including two potential flaws in the data handling". This is an important paper, as the Martens' results have been used to create damage functions that are in place within IAMs. https://link.springer.com/article/10.1007/s10584-017-1956-6 I have conducted research for Australian cities that also finds that cold-related mortality has been overstated, however, this paper is under review at Climatic Change and I am unable to provide it as a reference for this report as it is still at the revise and resubmit stage. I encourage you to include the Huber et al. 2017 paper as a reference. [Thomas Longden, Australia]	Rejected – space limitations preclude adding further explanations and caveats

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40518	123	23	123	25	Confirm whether you are referring to policy induced adaptation or whether people are becoming better adaptors for another reason. For example, heatwave warning systems may have caused some of this adaptation. I am unsure whether you are including these public health policies in this statement. There are not many papers that assess the impact of heat warning systems, but you may want to mention this and refer to papers that do make these assessments. Examples of paper that may be useful for this are: https://link.springer.com/article/10.1007/s00038-013-0465-2, https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-14-1112, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5089885/ [Thomas Longden, Australia]	Not applicable – section no longer included in the chapter
1840	123	25	123	26	But does additional adaptation fully eliminate health risks at 1.5 or 2 oC? [Greece]	Taken into account - statement revised for clarity
5940	123	27	123	27	It is also important to consider how the effect of cold waves on the different age groups evolves. Increasing occasionally, the mortality attributable to cold waves in elderly people and having a higher impact than those attributable to heat (Díaz et al. 2015). Díaz J, Carmona R, Mirón IJ, Ortiz C, Linares C. Comparison of the effects of extreme temperatures on daily mortality in Madrid (Spain), by age group: the need for a cold wave prevention plan. Environmental Research, 2015; 143:186-191. [Cristina Linares, Spain]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
8720	123	29	123	29	levels place additional stress placed on' should be 'levels place additional stress on' [Robert Shapiro, United States of America]	Accepted – sentence was revised.
16380	123	29	123	31	Please explain that dry bulb-wet bulb temperature difference is a measure of relative humidity, and that relative humidity is the "environmental condition" that should be monitored. [Australia]	Not applicable – section no longer included in the chapter.
8722	123	30	123	30	WBGT) enable monitoring of' should be 'WBGT) enables monitoring of' [Robert Shapiro, United States of America]	Not applicable – section no longer included in the chapter.
8724	123	31	123	31	productivity; they were' should be 'productivity; it was' [Robert Shapiro, United States of America]	Not applicable – section no longer included in the chapter.
22188	123	32			insert space between "outcomes(Niosh" [LUIS VALDES, Spain]	Not applicable – this text was deleted.
22190	123	32			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44552	123	32	123	32	health outcomes(Niosh 2016) [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
586	123	36	123	38	The numbers cited for Hsiang et al 2017 arenot an energy system impact. It is a welfare loss driven by the combination of mortality, labor productivity, energy demand, coastal damages, crop losses, and crime. See Fig 3d of Hsiang et al 2017 for electricity demand impact as a function of temperature. [Robert Koppu, United States of America]	Rejected – Hsiang et al. is not cited.
5936	123	36	123	37	One paper carried out in Madrid (Spain) on how the impact of heat waves on different age groups has evolved, showed that the risk has decreased in the age groups traditionally considered as especially susceptible, such as those over 65 years and increases significantly in the 18 to 44 age group in the last decade (Díaz J et al. 2015). Díaz J, Carmona R, Mirón IJ, Ortiz C, Linares C. Comparison of the effects of extreme temperatures on daily mortality in Madrid (Spain), by age group: the need for a cold wave prevention plan. Environmental Research, 2015; 143:186-191. [Julio Diaz, Spain]	Not applicable – section no longer included in the chapter
6338	123	39	123	48	Can this information be presented in a clearer form in terms of the 2 and 1.5 degree pathways? Also: does the sentence in lines 46-48 refer to a 1.5 degree pathway? [Anne Olhoff, Denmark]	Taken into account – text edited for clarity and relevance
18452	123	39	123	48	Can this information be presented in a clearer form in terms of the 2 and 1.5 degree pathways? Also: does the sentence in lines 46-48 refer to a 1.5 degree pathway? [Andrea TILCHE, Belgium]	Taken into account – text edited for clarity and relevance
43196	123	40	123	48	Byers et al project increased risk of heat events (3 consecutive days above historical 99th percentile WBGT) - with an SSP2 2050 population, at 1.5C ~4 billion are impacted at moderate risk (more than doubling of event exposure), rising to 6bi and 8 billion for 2.0 and 3.0C. [Edward Byers, Austria]	Accepted – literature recommendation was integrated into the text
22192	123	41			Please note that a comma must be inserted in between of the authors names and the year of publication (three in this line) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
8726	123	43	123	43	WBGT increase 3°C' should be 'WBGT increases 3°C' [Robert Shapiro, United States of America]	Not applicable – this text was removed.
35274	123	43	123	44	It would be useful to add a recenty study for East Asia (Lee and Min 2018) here. Based on WBGT simulated by CMIP5 multi-models, they find that the 1.5-degree warmer world would have about 20% reduction in areas experiencing severe heat stress over East Asia compared to the 2-degree warmer world. Lee S.-M. and ?S.-K. Min, 2018: Heat Stress Changes over East Asia under 1.5? and 2? Global Warming Target. J. Climate, in press, https://doi.org/10.1175/JCLI-D-17-0449.1 [Seung-Ki Min, Republic of Korea]	Accepted – Reference was added. Thank you.
8728	123	44	123	44	WBGT also are projected' should be 'WBGT is also projected' [Robert Shapiro, United States of America]	Not applicable – this text was removed.
8730	123	50	123	50	future risks higher' should be 'future risks of higher' [Robert Shapiro, United States of America]	Not applicable – this text was removed.
8732	124	3	124	3	different' should be 'difference' [Robert Shapiro, United States of America]	Accepted – Text was revised with the suggested edit.
2312	124	5	124	5	Are workers obliged to work in extremely hot days , or do they work voluntaruily? If the former, then 'compensation' instead of 'subsidies' should be used; otherwise, the term 'incentives' shoule be used. [Greece]	The authors of the referenced study used the term subsidies. A governmental regulation requires that employers pay high-temperature subsidies to workers during high-temperature days (when the daily maximum temperature (Tmax) exceeds 35 °C). Therefore, the terms compensation and incentives are not appropriate alternatives.
22194	124	6		7	In order to facilitate a standard for comparison and also to facilitate the reading, currencies must be converted into USD. [LUIS VALDES, Spain]	Rejected – units were left as projected to ensure accuracy
44554	124	7	124	50	Spacing issue in 5 places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
60568	124	10	124	14	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
40334	124	15	124	15	There was significant increase of fungal spores in the different workplace environments in Egypt. Penicillium was the most dominant in the ceramic indoor environment followed by Aspergillus fumigatus and Aspergillus niger (Reference: Saad A, Awad A-H, and Aziz H. (2006). Assessment of respiratory health problems due to exposure to airborne fungi in ceramics industry. Egyptian Journal of Occupational Medicine; 30 (2): 193-216. Also, textile and wheat handling workers were proved to expose to high airborne counts of fungi mainly Penicillium and Aspergillus species (Reference: Saad-Hussein A, Elserougy S, Beshir S, Ibrahim M.I.M., Awad A, and Abdel-Wahhab M.A. (2012). Work-Related Airborne Fungi and the Biological Levels of Mycotoxin in Textile Workers. J. Appl. Sci. Res; 8(2): 719-726). These environmental exposures were found to be a risk factor for elevation of aflatoxin B1 (carcinogenic mycotoxin) and the tumor biomarkers among the exposed workers (References: Saad-Hussein A, Beshir S, Moubarz G, Elserougy S, and Ibrahim MIM. (2013). Effect of Occupational Exposure to Aflatoxins on Some Liver Tumor Markers in Textile Workers. American Journal of Industrial Medicine; 56 (7): 818–824) and (Saad-Hussein A, Taha MM, Beshir S, Shahy EM, Shaheen W, Elhamshary M (2014). Carcinogenic effects of aflatoxin B1 among wheat handlers. International Journal of Occupational and Environmental Health (IJOEH); 20 (3): 215-219). [Amal Hussein, Egypt]	Taken into account – sentence added that poor air quality issues outside ozone and PM were not included because of lack of projections specifically at 1.5°C / 2°C warming
16382	124	16	124	31	Although the projected change in surface ozone depends on future emision scenarios, overall changes in globally background ozone is an increasing trend. Pfister et al (2014) showed changes in climate and globally enhanced background ozone increase the surface ozone concentration over most of the U.S.; the 95th percentile for daily 8 h maximum ozone increases from 79 ppb to 87 ppb. Stringent emission controls can counteract these feedbacks; if implemented as in RCP8.5, the 95th percentile for surface ozone is reduced to 55 ppb. [Australia]	Rejected – beyond the mandate of this chapter
16384	124	16	126	31	In Sydney, NSW, Cope et al, 2008 studied the impact of climate change on ozone in Sydney urban areas using TAPM-CTM air quality dispersion model for A2 SRES scenario (a high end CO2 emissions growth scenario). Cope et al. 2008 study showed that a predicted increase in daily maximum temperatures resulted in an increase in ozone concentrations for various emission scenarios in the future periods of 2020-2039 and 2060-2079. [Australia]	Taken into account – Cope et al. 2008 could not be located. Physick et al. 2014 appears to cover similar analyses. This reference was not included because it did not include projections for 1.5°C / 2°C warming.
43622	124	16	124	31	More reference to support this statement (e.g., Cho et al., 2014; Kim et al., 2010) Cho et al., 2014; Air pollution as a risk factor for depressive episode in patients with cardiovascular disease, diabetes mellitus, or asthma Journal of Affective Disorders, 157, 45-51 Kim et al. 2010; Ambient Particulate Matter as a Risk Factor for Suicide, American Journal of Psychiatry, 167, 1100-1107 [Jinkyu Hong, Republic of Korea]	Taken into account – however, as requested by the UNFCCC, the text focuses on the health risks at warming of 1.5°C and 2°C.
45728	124	16	124	20	It should be mentioned, that O3 in itself is a SLCF. Any uncertainty for the formation and concentration of O3 will feedback/be linked to climate uncertainties. For this reason, dealing with the formation of secondary pollutants in the context of health only, falls short of the importance that e.g. O3 and SOA have as SLCPs. [Astrid Kiendler-Scharr, Germany]	Rejected – beyond the mandate of this chapter
8734	124	18	124	18	the dispersionof primary' should be 'the dispersion of primary' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
8736	124	19	124	19	particulatematter, and intensify' should be 'particulate matter, and intensify' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35978	124	19	124	19	Add space between 'particulate' and 'matter' [India]	Editorial – copyedit to be completed prior to publication
54380	124	20	124	23	New studies from the IMPACT2C and other projects looked at ozone changes in Europe in 2°C and 3°C worlds, see eg. Fortems-Cheiney, A., G. Foret, G. Siour, R. Vautard, S. Szopa, G. Dufour, A. Colette, G. Lacressonniere and M. Beekmann, 2017 : A 3°C global RCP8.5 emission trajectory annihilates the benefits of European emission reductions on air quality. Nature Communications, doi:10.1038/s41467-017-00075-9.. For PM, see eg. Lacressonnière, G. L. Watson, . Gauss, M. Engardt, C. Andersson, M. Beekmann, A. Colette, G. Foret, B. Josse, V. Marécal, A. Nyiri, G. Siour, S. Sobolowski and R. Vautard (2017). Particulate matter air pollution in a +2°C warming world. Atmos. Environ., 154, 129-140. See also Meleux and Giorgi (2011?) [Robert Vautard, France]	Rejected – literature recommendations do not compare risks specifically at 1.5°C / 2°C warming
6340	124	28	124	29	If this refers to changes in projected PM-mortality associated with a move from 2 to 1.5 degrees, the finding is surprising. How does this correspond to the discussion about especially SLCPs and their reduction under 2 and 1.5 degree scenarios? [Anne Olhoff, Denmark]	Accepted – sentence edited for clarity
18454	124	28	124	29	If this refers to changes in projected PM-mortality associated with a move from 2 to 1.5 degrees, the finding is surprising. How does this correspond to the discussion about especially SLCPs and their reduction under 2 and 1.5 degree scenarios? [Andrea TILCHE, Belgium]	Accepted – sentence edited for clarity
35980	124	28	124	31	Format the sentence and reference [India]	Accepted – text revised
40336	124	32	124	32	The Egyptian Environment Affairs Agency (EEAA) reports that air pollution is responsible for an average of 3,400 deaths each year in Cairo, in addition to about 15,000 cases of bronchitis, 329,000 cases of respiratory infection, and a large number of cases of asthma (Reference: UNEP (United Nations Environment Program (2007)Global Environment Outlook (GEO.4)Regional Office for West Asia .Air Quality and Atmospheric Pollution in the Arab Region .At :http//:huwu.org/esa/sustdev/csd/csd14/escwaRIM_bp1.pdf) [Amal Hussein, Egypt]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
40338	124	32	124	32	Saad-Hussein et al. (2011) detected a significant rise in the relative frequency of the eyes fungal infections (keratomycosis) in Greater Cairo. This rise was correlated significantly with rises in minimum temperature and the maximum atmospheric humidity over the same period, and predicted increase in keratomycosis with the predicted increase in CO2 emissions and surface temperature in Egypt up to the year 2030. (Reference: Saad-Hussein A, El-Mofty HM, and Hassanien MA (2011). Climate Changes and Fungal Keratitis Trend: In Egypt. Eastern Mediterranean Health Journal (EMHJ); 17 (6): 468-473 [Amal Hussein, Egypt]	Rejected – literature recommendation does not provide projections specific to 1.5°C / 2°C warming
16386	124	33	124	33	It does not seem to follow that climate change will increase undernutrition, especially since previously sections sugested there may be increases in food production in some areas (e.g. parts of Africa). Also theres a grammatical error - double negative "negatively affect childhood undernutrition" [Australia]	Accepted – sentence edited for clarity
49224	124	33	124	46	Impacts of climate change and of changing consumption behaviours on undernutrition need to be more clearly separated in this sentence [Bill Hare, Germany]	Not applicable – majority of section including sentence referred to were removed from the chapter

Comment No	From Page	From Line	To Page	To Line	Comment	Response
34788	124	38	124	40	The sentence as stated is rather misleading as it gives the impression that red meat consumption is beneficial for health when the article cited explains that the opposite is the case. The article which is cited, Springmann et al., notes that there are 'health benefits associated with reductions in red meat consumption'. However, in their modelling the health benefits of lower meat consumptions are outweighed by negative health implications of lower vegetable and fruit consumption. Thus in order to avoid being misleading, the words 'consumption of red meat' should be removed from the sentence. [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Accepted – text revised: words were removed
2314	124	41	124	42	Delete the sentence 'For example, …..2930-2960 kcal person-1 day-1 at 2ºC .' as this is not an example of health impact. [Greece]	Accepted – text revised: sentence was removed
12098	124	42	124	42	Is this a statistically significant difference? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – statistical difference was not tested
41622	124	42			Change "2950-2960 kcal/person/day" to "2950-2960 kcal person-1 day-1", see next part of the same line. [Czech Republic]	Not applicable – this text was removed.
2316	124	44	124	45	This sentence does not belong to health impacts - move it to food security (section 3.4.6.5). [Greece]	Accepted – sentence moved
646	124	48	125	24	In order to keep consistency throughtout this section, the text about malaria and the following one (Aedes) which are all transmitted by mosquitos should be re-named as "Malaria, dengue fever and other mosquito-borne diseases". [Maria Jesus Iglesias Briones, Spain]	Taken into account – subsection headings were revised.
6342	124	48	125	42	Contrary to the previous paragraphs, this part is unclear about the 2 and 1.5 degree outcomes. It seems to be because it isn't possible to quantify the difference in effects under 2 and 1.5, but would be good to make this clear. [Anne Olhoff, Denmark]	Accepted – part of this paragraph deleted; the rest edited for clarity
8356	124	48	124	49	Here is an assessment of the impact of climate change at the regional scale. It is suggested to delete China while retaining Asia. [China]	Accepted – text revised
18456	124	48	125	42	Contrary to the previous paragraphs, this part is unclear about the 2 and 1.5 degree outcomes. It seems to be because it isn't possible to quantify the difference in effects under 2 and 1.5, but would be good to make this clear. [Andrea TILCHE, Belgium]	Accepted – part of this paragraph deleted; the rest edited for clarity
60570	124	48	125	11	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.
22196	124	50			insert space between "2014)that" [LUIS VALDES, Spain]	Not applicable – this text was removed.
22198	125	1		2	Please note that a comma must be inserted in between of the authors names and the year of publication (six cases in these two lines) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
31078	125	1	125	11	The role of non-climatic factors in determining how malaria will be affected by CC needs more prominence. Vulnerabilitiy to malaria at regional, local, community, and household scales is strongly patterned by non climatic factors. The other health risks profiled on this page also need to acknoweldge this - the geographic range may spread but this does necessarily translate into enhanced vulnerability. [James FORD, Canada]	Taken into account – existence of other risk factors mentioned
60572	125	1	125	51	Provide more justification for conclusions in each of these paragraphs, including information on how geographical shifts may limit vector activity in some areas, and how other non-climatic factors may impact shift in vector-borne diseases, including socio-economic impacts. [United States of America]	Rejected – space limitations preclude adding further explanations
10922	125	10	125	10	Change to 'reductions depending on the degree of local…' [Franklin Paredes, Brazil]	Accepted – text was revised with the suggested edit.
22200	125	10			correct "th" by "the" [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
62950	125	13		20	Cite Chadee, D.D and Martinez, R. (2016). Aedes aegypti (L.) in Latin American and Caribbean region: With growing evidence for vector adaptation to climate change? Acta Trop.156:137-43. doi: 10.1016/j.actatropica.2015.12. These authors have done excellent, ground breaking research on this topic. [Michelle Mycoo, Trinidad and Tobago]	Rejected – literature recommendation does not provide projections specific to 1.5°C / 2°C warming
22202	125	14			insert space between "Aedesaegyptii" [LUIS VALDES, Spain]	Accepted – text was revised with the suggested edit.
47296	125	17	125	17	Butterworth 2017 is missing from the references - suggest it is 2016 instead? [Sarah Connors, France]	Not applicable – reference in question is no longer cited in the text.
8358	125	21	125	22	Here is an assessment of the impact of climate change at the regional scale. It is suggested to delete China while retaining Asia. [China]	Accepted – text was revised with the suggested edit.
44556	125	26	125	36	Perhaps elaborate these by giving more details on current and anticipated hotspots, optimal weather conditions for transmission? [Rita Man Sze Yu, China]	Rejected – space limitations precludes adding further explanation
22204	125	32		36	Repetitive with page 122 lines 1-16 [LUIS VALDES, Spain]	Taken into account – earlier text removed
44558	125	40	125	40	higher degrees of warming(Carvalho et al., [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
60574	125	44	125	44	Because this is a report on 1.5°C warming, it would be better to emphasize what happens with 1.5°C. [United States of America]	Accepted – statement edited for clarity
8738	125	45	125	45	regional patternsand a few' should be 'regional patterns and a few' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
10918	125	45	125	45	Change to 'complex regional patterns and a few exceptions. Each additional unit of warming will very…' [Franklin Paredes, Brazil]	Editorial – copyedit to be completed prior to publication
22206	125	45			insert space between "patternsand" [LUIS VALDES, Spain]	Not applicable – This section was rewritten.
44560	125	45	125	45	complex regional patternsand a few exceptions. [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
18458	125	46	125	47	The sentence that it is very likley that increases in temperature would lead to increases in ozone-related mortality is misleading. P. 124,20-22 indicate low confidence in projected changes in ground level ozone and particulate matter. While only considering temperature may indicate an increase in ozone concentrations, many other factors are at play that may lead to very different results. Revise the sentence to better reflect this unceratanty. [Andrea TILCHE, Belgium]	Accepted – statement edited for clarity
46792	125	46	125	50	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted – text was edited for clarity.
10920	125	47	125	47	Change to 'remain the same, and likely increase undernutrition….' [Franklin Paredes, Brazil]	Editorial – copyedit to be completed prior to publication
22208	125	47			reamin or "remain"? [LUIS VALDES, Spain]	Accepted – text was revised with the suggested edit.
30526	125	47	125	47	Typo : in advantages (be careful like that it looks like the opposite) [France]	Noted – unclear what this comment refers to.
35982	126		126		In fig 3.21 include impacts on crops (last portion) may be included under rural areas. For this, a separate colour with Impacts on rural reas may be considered. Alternatively develop a full figure depicting effects on rural areas, including health, agriculture, livelihoods, etc. [India]	Taken into account – Figure 3.21 was deleted. Schleussner et al. 2016b do not parse impacts by types of settlements.
40846	126		126		In fig 3.21 include impacts on crops (last portion) may be included under rural areas. For this, a separate colour with Impacts on rural reas may be considered. Alternatively develop a full figure depeicting effects on rural areas, including health, agriculture, livelihoods, etc. [NARESH KUMAR SOORA, India]	Comment duplicated – please see response to comment #35982
49226	126	3	126	18	This section does not give information on which impacts of climate change can be observed in cities. For example, is the mentioned flood event that followed Hurricane Sandy an impact of CC? Links should be made between the impacts that have been mentioned in previous sections and the specific characteristics of urban environments to give an idea of which impacts have been observed [Bill Hare, Germany]	Taken into account — text was revised. Text on "Observed impacts" in Section 3.1.2.1 was deleted as per comment 60576. Urban climate change impacts are to be addressed in AR6.
61912	126	3	129	20	I suggest to merge all city related aspects in a common box, as there is inconsistency and repetition across sections of text. [Valérie Masson-Delmotte, France]	Taken into account – text was revised. Text from Section 3.3 related to Urban Heat Islands (UHI) was consolidated in Section 3.4.8 "Urban areas".

Comment No	From Page	From Line	To Page	To Line	Comment	Response
41434	126	4	126	18	The subsection is supposed to be observed impacts. [Lourdes Tibig, Philippines]	Taken into account – text was revised. Text on "Observed impacts" in Section 3.1.2.1 was deleted as per comment 60576.
60576	126	4	126	18	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.
140	126	7	126	7	infrastructure(t.b.c "infrastructure (" [teodoro georgiadis, Italy]	Editorial – copyedit to be completed prior to publication
22210	126	7		8	Please note that a comma must be inserted in between of the authors names and the year of publication (five cases in these two lines) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44562	126	7	126	7	infrastructure(Revi et al. 2014; [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
30854	126	8	126	10	I would expect many references to justify this sentence as well as more explanations in particular geographic regions or relevant categories. [Érika Mata, Sweden]	Taken into account – text was revised. Text on "Observed impacts" in Section 3.1.2.1 was deleted as per comment 60576.
44564	126	11	126	12	for example,the inland 11 and coastal flooding of3.4 m above 2012 [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
8740	126	12	126	12	flooding of3.4 m above' should be 'flooding of 3.4 m above' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
10924	126	12	126	12	Change to 'flooding of 3.4 m above 2012 mean sea level observed in New York City…' [Franklin Paredes, Brazil]	Editorial – copyedit to be completed prior to publication
22212	126	12		32	Please review and correct spaces between words (e.g. lines 26, 30, 39) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
28416	126	12	126	12	Highlighting New York City as the sole example in such a generic paragraph seems inappropriate. Please either add other examples, or delete this one. This example is to specific to mention it in greater view of flood problems in cities. Also, if this example is kept, please correct "Hurricane Sandy" to read "Tropical Storm Sandy". [Germany]	Accepted – example was deleted.
35184	126	12	126	12	The spacing is missing between the words "of3.4m" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
56850	126	16	126	18	The AR5 WGII Cross Chapter Box on Rural Urban Linkages is relevant here, Morton, J., Solecki, W., Dasgupta, P., Dodman, D., & Rivera-Ferre, M. G. (2014). Cross-chapter box on urban–rural interactions–context for climate change vulnerability, impacts, and adaptation. In Climate Change 2014: Impacts, Adaptation, and Vulnerability . Transportation is another way in which impacts can cascade from the rural to the urban sphere. It should also be noted that forms of (mal)adaptation in cities can have indirect impacts on rural areas [John Morton, United Kingdom (of Great Britain and Northern Ireland)]	Rejected – outside chapter mandate. Text related to this review comment was deleted.
35186	126	20	126	20	Following study should be cited under the section: The warming of 1.5°C in future will help avoid 35%–38% of the increase in the intensity of extreme high-temperature events, nearly 39%–46% increase in the duration of extreme high-temperature events and 37% higher frequency of extreme high-temperature events. Therefore, limiting global warming to1.5°C can help avoid 35%–46% of the increases in extreme temperature events in terms of duration, intensity, and frequency in East Asia .Most densely populated regions like eastern China, the Korean Peninsula, and Japan, will see larger extreme heats increase than the other subregions of East Asia. The increasing of extreme heats will be reduced over one third in the 1.5°C warming climate as compared to 2°C above preindustrial level(Li et al., 2018) Citation: Li, D., Zhou, T., Zou, L., Zhang, W., & Zhang, L. (2018). Extreme high temperature events over East Asia in 1.5°C and 2°C warmer futures: Analysis of NCAR CESM low-warming experiments. Geophysical Research Letters, 45. [Shaukat Ali, Pakistan]	Rejected – References recommended provide regional, not urban data and are not relevant to this section.
49228	126	20	128	26	Changes in humidity and heavy precipitation that were mentioned in Section 3.3.3.2 should rather be mentioned here since they may amplify the risk caused by increased temperature [Bill Hare, Germany]	Not applicable – this figure was removed.
53422	126	20	126	20	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial – copyedit to be completed prior to publication
53540	126	20	126	20	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial – copyedit to be completed prior to publication
8742	126	26	126	26	are amplifiedwhen' should be 'are amplified when' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
10926	126	26	126	26	Change to 'differential risks at 1.5 versus 2°C are amplified when…' [Franklin Paredes, Brazil]	Editorial – copyedit to be completed prior to publication
35984	126	26	126	26	Add space between 'amplified' and 'when' [India]	Editorial – copyedit to be completed prior to publication
44566	126	26	126	26	1.5 versus 2°C are amplifiedwhen [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
46058	126	26	126	26	amplified when [Justin Oogjes, Australia]	Editorial – copyedit to be completed prior to publication
30856	126	30	126	30	Isn't Vahid Moussavi the name and not the surname? These references may also be appropiate: Zhu, Mingya, et al. "An alternative method to predict future weather data for building energy demand simulation under global climate change." Energy and Buildings 113 (2016): 74-86.; Herrera, Manuel, et al. "A review of current and future weather data for building simulation." Building Services Engineering Research and Technology 38.5 (2017): 602-627. [Érika Mata, Sweden]	Taken into account – The Moussavi-reference was dropped from the text. Both recommended articles (Zhu, et al., and Herrera, et al.,) are about methods and not relevant to this section.
8744	126	32	126	32	distinguishdifferent effects' should be 'distinguish different effects' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35986	126	32	126	32	Add space between 'distinguish' and 'different' [India]	Editorial – copyedit to be completed prior to publication
44568	126	32	126	32	Yu et al. (2016) distinguishdifferent effects between [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
46060	126	32	126	32	distinguish different [Justin Oogjes, Australia]	Editorial – copyedit to be completed prior to publication
22214	126	36			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
28418	126	36	126	39	This meaning and context of this subsection is unclear, especially the last sentence. Also, key risks in urban areas would include health effects and issues concerning environmental justice. Please revise. See also our comment to Figure 3.21. [Germany]	Taken into account – text was revised as suggested and the figure was deleted.
2318	126	39	126	39	It not clear why the loss of coral reefs poses an indirect risk of climate change to urban areas. [Greece]	Taken into account – figure was deleted and the reference to it was removed.
10444	126	39	126	39	I find the reference the connection of risks to cities from coral lllosses unclear. I'd say coral reefs are much more important for local livelihoods but more for local fishermen and tourit operators which are not necessarily specific to urban areas. The same holds for figure 3.21 [Christopher Reyer, Germany]	Taken into account – figure was deleted and the reference to it was removed.
18460	126	39	126	39	Unclear how coral reef loss would affect urban areas? And why this specific ecosystem change, and not others e.g. loss of coastal wetlands, or forests, or snow cover,… [Andrea TILCHE, Belgium]	Taken into account – figure was deleted and the reference to it was removed.
29356	127		127		Figure 3.21 has a bad quality [Borbala Galos, Hungary]	Not applicable – this figure was removed.
35988	127				Font of Text within the figure 3.21 may be increased to make it readable. [India]	Not applicable – this figure was removed.
41436	127		127	4	In Figure 3.21, the capion mentions stylized 1.5°C 2°C"-what is meant by this? [Lourdes Tibig, Philippines]	Not applicable – this figure was removed.
55920	127		127		Figure 3.21 is too blurry [Debora Ley, Guatemala]	Not applicable – this figure was removed.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
6344	127	1	127	3	Figure 3.21 provides a great graphical overview of some of the differences in risks associated with 1.5 and 2 degree temperature pathways. The link to urban risks, i.e. how these general risks translate into specific urban risks, could be strengthened. For example, the indirect link between coral reef bleaching and urban risks is difficult to understand. If possible, more regional examples would also be beneficial. [Anne Olhoff, Denmark]	Not applicable – this figure was removed.
9808	127	1	127	3	As referenced, this study is originally from Schleussner et al. 2016 and does not relate to any sort of urban risk. You cannot simply add a column to the left and make the figure an urban risk figure, this seems to be extremely unscientific. [Alexander Nauels, Australia]	Taken into account – Figure 3.21 was deleted.
18462	127	1	127	3	Figure 3.21 provides a great graphical overview of some of the differences in risks associated with 1.5 and 2 degree temperature pathways. The link to urban risks, i.e. how these general risks translate into specific urban risks, could be strengthened. For example, the indirect link between coral reef bleaching and urban risks is difficult to understand. If possible, more regional examples would also be beneficial. [Andrea TILCHE, Belgium]	Not applicable – this figure was removed.
24170	127	1	127	1	Resolution of the Figure 3.21' is very low! Please change it with a higher resolution version. [Mustafa Tufan Turp, Turkey]	Not applicable – this figure was removed.
24238	127	1	127	1	figure 3.21" low resolution, it should be renewed [Nazan AN, Turkey]	Not applicable – this figure was removed.
49354	127	1	127	1	the text in the image is too blur [Spyros Schismenos, China]	Not applicable – this figure was removed.
56768	127	1	127	1	Chart is great for showing differences in impacts from two different degrees of warming. Unfortunately, it is blurred and slightly difficult to read. [Cheryl Anderson, New Zealand]	Not applicable – this figure was removed.
61914	127	1	127	3	This is one single study figure (Schleussner), how is this synthesis coherent with the work done in the first sections of this chapter? We need other synthesis figures like this to bridge between the physical science parts (impacts) and the risk assessment. [Valérie Masson-Delmotte, France]	Taken into account – Figure 3.21 was deleted and a reference to Section 3.3 was added.
22216	127	2			This is a very good figure/table. I wonder if similar tables can be produced for other indicators through the entire chapter. [LUIS VALDES, Spain]	Not applicable – this figure was removed.
41438	127	5	127	19	transform this into an assessment, not a literature review. [Lourdes Tibig, Philippines]	Taken into account – text was revised.
8746	127	6	127	8	The UHI intensity is projected to decrease overall by 6% for a doubling of CO2, with a range of up to a 30% increase' Seems contradictory: 'decrease overall' then 30% increase ?? [Robert Shapiro, United States of America]	Accepted – sentence was edited for clarity.
49230	127	6	127	13	These sentences deliver contradicting results on the future intensity of the UHI effect and thus should be checked for consistency [Bill Hare, Germany]	Accepted – sentences were edited for clarity.
16388	127	10	128	5	The NSW study on UHI in Sydney was carried out under NARCLIM project (Adams, M., Duch, H, Trieu, T.) also predicted incresing UHI effect under future climate change under AR5 (CMIPS3). This should be mentioned in here. [Australia]	Not applicable – this figure was removed.
44570	127	10	127	10	Extra space "used km-scale regional climate models" [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
10340	127	11	127	11	Urban heat island instead of "urban health island" [Hungary]	Accepted – text was edited for clarity.
16390	127	11	127	11	Urban Heat Island not "Urban Health Island" [Australia]	Accepted – text was edited for clarity.
29544	127	11			urban heat (not urban health) [Finland]	Accepted – Text was revised with the suggested edit.
46062	127	11	127	11	urban health? Island or "urban heat island"? [Justin Oogjes, Australia]	Accepted – text was edited for clarity.
4318	127	15	128	5	Sentences "Projection of near surface temperature in Israeli cities due to urbanization by mid-century are expected to exceed 3°C in several urban jurisdictions (Kaplan et al., 2017). … Land-use changes due to urbanization in eastern China are altering the regional land-sea temperature difference and may be a contributing factor to changes in the East Asian Subtropical Monsoon (Yu et al., 2016)." were repeated in different sections. [Gensuo JIA, China]	Taken into account – text was revised to remove duplication.
4306	128	3	128	5	"Land-use changes due to urbanization in eastern China are altering the regional land-sea temperature difference and may be a contributing factor to changes in the East Asian Subtropical Monsoon (Yu et al., 2016)." The sentence itesIt is ok, but it is not quite revelant to this chapter. I don't see any further discussion on climate effects of land use in this chaapter. These content may be moved to SRCCL report. [Gensuo JIA, China]	Taken into account – text was revised, the sentence in question was removed from the text.
8748	128	7	128	7	+ 0.5°Cofglobal' should be '+ 0.5°C of global' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
10928	128	7	128	7	Change to 'heat events, + 0.5oC of global warming implies a robust shift..' [Franklin Paredes, Brazil]	Editorial – copyedit to be completed prior to publication
16392	128	7	128	15	The text mentions increasing water stress for Mediterranean Cities, similar impacts are predicted in some major Australian cities with similar Mediterranean climates, especially Perth, Western Australia. See McFarlane et al. 2012 doi:10.1016/j.jhydrol.2012.05.038 [Australia]	Not applicable – this figure was removed.
22218	128	7			insert space between "Cof" [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
43198	128	9	128	10	Byers et al project increased risk of heat events (3 consecutive days above historical 99th percentile WBGT) - with an SSP2 2050 population, at 1.5C ~4 billion are impacted at moderate risk (more than doubling of event exposure), rising to 6bi and 8 billion for 2.0 and 3.0C. [Edward Byers, Austria]	Not applicable – this figure was removed.
8750	128	11	128	11	large slum and' should be 'large slums and' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
6346	128	17	128	19	The following sentence is difficult to understand: If climate change is held below 2°C, taking into consideration urban heat island effects, there could be a substantial increase in the occurrence of deadly heatwaves in cities, with the impacts similar at 1.5°C and 2°C, but substantially larger than under the present climate" [Anne Olhoff, Denmark]	Taken into account – sentence was revised for clarity.
18464	128	17	128	19	The following sentence is difficult to understand: If climate change is held below 2°C, taking into consideration urban heat island effects, there could be a substantial increase in the occurrence of deadly heatwaves in cities, with the impacts similar at 1.5°C and 2°C, but substantially larger than under the present climate" [Andrea TILCHE, Belgium]	Taken into account – sentence was revised for clarity.
41440	128	17	128	26	no confidence levels? [Lourdes Tibig, Philippines]	Not applicable – this figure was removed.
2320	128	18	128	18	If climate change is held below 2°C, taking into consideration urban heat island effects, there could be a substantial DECREASE in the occurrence of deadly heatwaves in cities…' [Greece]	Accepted – statement was corrected.
5630	128	25	128	25	. old references…nothing more recent? [Sandra CASSOTTA, Denmark]	Not applicable – this figure was removed.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
43226	128	32	128	34	I'm somewhat skeptical about the efficacy of reflective surfaces in this context. The frequency and intensity of heatwaves will still be the same - and it is not clear that these adaptation measures could negate the full effect of global warming… to what extent has this been shown? There are three mentions of reflective surfaces in the chapter. But in the context of Karachi and Kolkata, two extremely hot places with hugely vulnerable populations - I think the somewhat unspecific suggestion that adaptations coud avoid (some? all? who knows?) of these impacts, could be misleading. [Edward Byers, Austria]	Not applicable – this figure was removed.
43228	128	32	128	34	As a more general point - it is not clear that this specific adaptation measure gets several mentions in the chapter when heatwaves are mentioned - yet throughout the text we are not mentioning the numerous other adaptation measures that could be implemented for every single climate impact. Green spaces, fountains, air conditioning... all could be applicable for heatwaves. Then how about mention flood defences, coastal walls, groundwater recharge, rainwater harvesting, etc etc for other climate impacts. The comments seem somewhat out of place unless we are talking about adaptation. [Edward Byers, Austria]	Not applicable – this figure was removed.
6348	128	37	128	48	The introduction to the subsection could be improved and at least indicate that the sectors mentioned will be addressed in the following, plus list them in the order they are subsequently addressed. [Anne Olhoff, Denmark]	Taken into account – Section was edited for clarity
10448	128	37			Aren't agriculture, forest and their products and important category of "Key economic sectors and services" that should be assessed in this section? [Christopher Reyer, Germany]	Rejected – this topic is covered in Section 3.4.6, thus not relevant for this section
18466	128	37	128	48	The introduction to the subsection could be improved and at least indicate that the sectors mentioned will be addressed in the following, plus list them in the order they are subsequently addressed. [Andrea TILCHE, Belgium]	Taken into account – Section was edited for clarity
54488	128	37	131	16	What is the justification for 'key economic sectors'. Tourism, especially seems misplaced, since it is often a major contributor to emissions, pollution and not a vital system (or sector) like energy or transport. [Thomas Thornton, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – Tourism represents over 9% of global GDP and approaching 10% of global jobs (both of which are projected to increase through to the mid-2020s). Tourism represents over 25% GSP and employment in many SIDS and is looked upon as a major development strategy there at in LDCs to achieve the SDGs (where there are few alternatives). [Note that the Tourism section was moved to Section 3.4.9.]
60578	128	37	129	2	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Taken into account – Section was edited for clarity and relevance.
22220	128	42			Remove empty spaces to connect lines [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44572	128	42	128	43	Spacing issue "Cramer et al. (2014) concluded that in low-income countries" [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
480	128	47	129	2	It is worth mentioning that many climate change impacts are considerable or serious for local economy and certain sectors within limited time period although they might be small at the national level. For small poor countries, the impacts might be too large to be tolerant. [Taoyuan Wei, Norway]	Rejected – No specific examples for 1.5°C/2°C exist in the literature
19166	129	9	129	17	It is clear that weather and climate conditions constrain energy production and supply, being most evident in the case of variable renewable energy. I suggest to enrich Section 3.4.9.1.1 by mentioning evidences of already observed impacts on the energy sector (demand and supply sides) derived from climatic trends in the past decades, if such evidences exist. Otherwise, it could be added that "however, to date, no evidences have been reported linking climatic trends with impacts on the energy sector in the past" or similar. [Sonia Jerez, Spain]	Taken into account – Parts of paragraph were removed and the rest was edited for clarity and relevance. Lack of evidence was highlighted when appropriate.
41442	129	9	129	17	Not observed impacts [Lourdes Tibig, Philippines]	Not applicable – Statement was removed, Section title was changed.
12100	129	16	129	17	Not clear what this sentence means [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – Sentence was removed.
28420	129	16	130	22	Climate change impacts affect the whole energy system, and can be especially pronounced for thermal generation. Page 129 line 16-17 consequently lists nuclear power and coal fired generation as affected technologies. But chapter 3.4.9.1.2 seems to focus nearly completely on renewable energy sources. This is a gap, please add information on climate change impacts on non-renewable energy production. [Germany]	Taken into account – Insufficient evidence on impacts of 1.5°C/2°C on non-renewable energy production
54382	129	16	129	17	Bioenergy should also be mentioned [Robert Vautard, France]	Taken into account – Impact of temperature increases on the thermal efficiency of biomass included (line 48-2). However, there was insufficient evidence on the impacts on bioenergy to 1.5°C/2°C scenarios.
22222	129	17		49	Please review and correct spaces between words (e.g. lines 17, 21, 42, 43, 49) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
2328	129	20	129	34	Information on the effects on energy demand in Europe and North America has to be included here. [Greece]	Taken into account – Paragraph was edited for clarity and relevance
6350	129	20	130	22	The section focuses almost exclusively on energy production/supply. What are the consequences for energy demand? [Anne Olhoff, Denmark]	Taken into account – Impacts of energy demand were included.
18468	129	20	130	22	The section focuses almost exclusively on energy production/supply. What are the consequences for energy demand? [Andrea TILCHE, Belgium]	Taken into account – Impacts of energy demand were included.
19168	129	20	130	22	A recent study by Tobin et al. would be worthy to mention here. This study assesses impacts under +1.5°C, +2°C and +3°C on wind, PV, hydro and thermoelectric power generation in Europe using a consistent modeling approach (based on EURO-CORDEX projections) across the different technologies. Results show that while impacts are relatively limited for PV and wind power, that may reduce up to 10%, hydropower and thermoelectric generation may decrease by up to 20%, with impacts remaining limited for a 1.5°C warming, but roughly double for a 3°C warming. The compound impacts, weighting the results for each technology by their relative share in the mix, are more severe in Southern Europe than in Northern Europe, inducing inequity between EU countries. REF: Tobin, I., Greuell, W., Jerez, S., Ludwig, F., Vautard, R., van Vliet, M.T.H., Bréon, and F.?M. (2018). Vulnerabilities and resilience of European power generation to 1.5°C, 2°C and 3°C warming . Environmental Research Letters, in press. [Sonia Jerez, Spain]	Accepted – recommended literature added
53424	129	20	129	20	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial – copyedit to be completed prior to publication
53542	129	20	129	20	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial – copyedit to be completed prior to publication
2326	129	21	129	21	Likely' means 66%-100% probability. In order to justify the use of the term 'likely' here, much more references should be mentioned (and not just one). In addition, the overall (net) effect of climate change on annual energy demand depends on the shares of cooling and space heating in this demand. [Greece]	Taken into account – The specific energy demand (air conditioning) and region (tropical and sub-tropical) were added, as well as additional reference.
7242	129	21	130	22	This paragraph is hard to follow, because it does not take a regional approcach (although one paragraph starts with "In Europe") nor a energy source approach (energy sources are provided rather randomly through the document). What is the logic ? [Samuel MORIN, France]	Taken into account – Section edited for clarity.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
16394	129	21	129	21	Won't warming decrease demand for energy in winter in mid-to high latitudes? How much will this offset increased energy demand in other areaas? Please clarify and be upfront about this. [Australia]	Not applicable – Sentence was removed.
42794	129	21	129	34	Increased temperatures will increase demand for cooling, increasing by 10-fold by 2050. Shah N., Wei M., Letschert V., & Phadke A., (2015) BENEFITS OF LEAPFROGGING TO SUPEREFFICIENCY AND LOW GLOBAL WARMING POTENTIAL REFRIGERANTS IN AIR CONDITIONING, Ernest Orlando Lawrence Berkeley National Laboratory. Isaac M. & Van Vuuren D. P. (2009) Modeling global residential sector energy demand for heating and air conditioning in the context of climate change, ENERGY POLICY 37:507–521. [Kristin Campbell, United States of America]	Rejected – No projections for 1.5°C/2°C and timeframe outside the mandate of this Special Report.
43032	129	21	129	34	Increased temperatures will increase demand for cooling, increasing by 10-fold by 2050. Shah N., Wei M., Letschert V., & Phadke A., (2015) BENEFITS OF LEAPFROGGING TO SUPEREFFICIENCY AND LOW GLOBAL WARMING POTENTIAL REFRIGERANTS IN AIR CONDITIONING, Ernest Orlando Lawrence Berkeley National Laboratory; Isaac M. & Van Vuuren D. P. (2009) Modeling global residential sector energy demand for heating and air conditioning in the context of climate change, ENERGY POLICY 37:507–521. [Durwood Zaelke, United States of America]	Comment duplicated – please see response to comment #42794
43168	129	21	129	21	increase energy demand for most regions . My opinion is that "most" is probably an overstatement and not particularly clear. - perhaps add something like "for most regions below the tropic of cancer".This is true for tropical and southern hemisphere regions, but for the mid and high latitudes northern hemisphere, climate change will certainly reduce energy demands - and the savings from less heating (from rising winter temperatures), will substantially outweigh the additional demands from more cooling. This is on a potential degree days basis alone. When you factor in the the fact that cooling typicall has a 3x performance factor over heating - it is obvious that energy demand in northern hemisphere temperate and cool climates will substantially reduce due to climate change. [Edward Byers, Austria]	Not applicable – Sentence was removed.
46794	129	21	129	21	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account – use of Uncertainty Language was revised.
61916	129	21	129	23	This appears quite orthogonal to the scenarios compatibe with 1.5°C assessed in chapter 2. Please check and coordinate. [Valérie Masson-Delmotte, France]	Taken into account – Paragraph was edited for clarity.
2322	129	22	129	22	reduce' instead of 'decrease' [Greece]	Change made
2324	129	23	129	23	It is not clear why climate change will reduce the thermal efficiency of buildings and other infrastructure. [Greece]	Taken into account – However, space limitations preclude adding more explanation
43194	129	24	129	26	Byers et al (Fig 1, section 3 and supplementary info) indicates increased coling energy demands (degree days), primarily in the Caribbean, Northeast Brazil, the Sahel of Africa, Middle East, South Asia and Southeast Asia. [Edward Byers, Austria]	Accepted – recommended literature added
7240	129	28	129	34	The content does not correspond to the title "Projected risks at 1.5 vs 2°C", the examples provided are disconnected from the 1.5 vs 2°C global warming framework (or, if so, the link should be more explicitely provided than in the current wording) [Samuel MORIN, France]	Taken into account – the section was changed.
16396	129	36	129	45	Suggest say there would be a mixed impact on hydro power. [Australia]	Taken into account – Changed, impacts on hydropower will vary depending on the region.
2330	129	38	129	41	The expected impact on GDP does not refer to energy systems only, but to the whole economy, therefore this sentence should be placed elsewhere. [Greece]	Taken into account – sentence was removed.
44574	129	42	129	49	Spacing issue in 4 places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
8752	129	43	129	43	the socioeconomiccondition' should be 'the socioeconomic condition' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35990	129	43	129	43	Add space between 'socioeconomic' and 'condition' [India]	Editorial – copyedit to be completed prior to publication
40958	129	43	129	43	Park et al is wrongly cited. The correct reference is below (still it is under review although it has already passed first review and resubmission) Chan Park, Shinichiro Fujimori, Tomoko Hasegawa, Jun'ya Takakura, Kiyoshi Takahashi, Yasuaki Hijioka; Avoided Economic impacts of energy demand changes by 1.5 and 2 °C climate stabilization, Environmental Research Letters. [Shinichiro Fujimori, Japan]	Accepted – reference was corrected.
19174	129	45	130	36	It is not clear if the projected losses of GDP derive only from impacts in the energ system. If so, please clarify. If not, this paragraph does not belong to this section that addresses energy systems only. [Andrea TILCHE, Belgium]	Not applicable – Paragraph was removed.
2332	129	47	129	47	This is contradictory to what is mentioned in line 21 (see also comment #87) [Greece]	Taken into account – Text was edited for clarity. Please note that Line 21 referred to AR5, whereas line 47 referred to evidence since AR5.
43192	129	47	130	8	Byers et al (Fig 1, section 3 and supplementary info) shows increased hydroclimatic risk (taking into account drought intensity, peak flows risk, seaosnality and inter-annual variability) to thermal and hydro power plants, predominantly in Europe, North America and south and southeast Asia, and south east Brazil. [Edward Byers, Austria]	Taken into account – recommended publication was added.
54384	129	47	130	22	The section misses one of the most important impact: that on thermal and nuclear electricity production, putting at risk electrcity productio (van Vliet et al 2016, NCC) [Robert Vautard, France]	Cited
141	129	49	129	49	latitudes(t.b.c. "latitudes (" [teodoro georgiadis, Italy]	Editorial – copyedit to be completed prior to publication
22224	129	49			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44576	130	6	130	7	later in the century (de Queiroz et al., 2016). (de Queiroz et al. 2016). [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
43034	130	7	130	8	However, peak electricity loads shift from winter to summer, and from northern to southern countries. ("Here we show that for Europe as a whole electricity consumption is projected to remain flat under future warming. However, this result does not imply that there are no damages from climate change for the electricity sector. Rather, we observe a shift in demand from the north, which has a much higher share of renewables in electricity consumption (35.8% in Sweden and 44.8% in Norway), to the south (Italy 17.6%, Spain 15.2%, and Greece 10%, ref. 43). In contrast to recent analyses for the United States (32), we further do not find a uniform rise in daily peak load across all regions. Instead, we find an increase in southern and western Europe and a decrease in the north. Additionally, we observe a change in the temporal load profile of many European countries with annual peak load—the highest load value of the year—shifting from winter to summer. In our dataset, 30 of the 35 countries currently experience annual peaks in winter. With warmer winters and hotter summers, it is an empirical question as to whether the annual peak will shift seasons. Using the residual (temperature-driven) simulation results for the 2080–2099 period under RCP-8.5, we find that 19 of these 30 countries will experience annual peak demand in summer instead of winter (SI Appendix, Table S4)."). Wenz L., Levermann A., Auffhammer M. (2017) North-south polarization of European electricity consumption under future warming, PROC. NAT'L. ACAD. SCI. www.pnas.org/cgi/doi/10.1073/pnas.1704339114. [Durwood Zaelke, United States of America]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming; demands are not compared at 1.5°C/2°C.
2334	130	8	130	8	Is Italy the only exception? There are also other countries in southern Europe wih energy demand characteristics similar to Italy (i.e. Portugal, Spain, Greece). [Greece]	Taken into account – text was edited for clarity.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
22226	130	8			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted – reference was corrected.
43170	130	9	130	9	It would probably be worth citing the paper by Bartos et al 2016 in ERL "Impacts of rising air temperatures on electric transmission ampacity and peak electricity load in the United States" http://iopscience.iop.org/article/10.1088/1748-9326/11/11/114008/meta This is a good study that both estimates changes in peak electricity load due to higher daytime air temeperatures - and also estimates reduced transmission capacity in the grid system (also due to higher air temps). "We find that by mid-century (2040–2060), increases in ambient air temperature may reduce average summertime transmission capacity by 1.9%–5.8% relative to the 1990–2010 reference period. At the same time, peak per-capita summertime loads may rise by 4.2%–15% on average due to increases in ambient air temperature." [Edward Byers, Austria]	Rejected – literature recommendations do not provide projections specific to 1.5°C / 2°C warming
2336	130	10	130	10	What do you mean by 'large-scale wind energy resources'? [Greece]	Large-scale wind farms, as opposed to small-scale operations
2338	130	10	130	13	Under which RCP scenarios do these findings occur? [Greece]	Taken into account – RCP8.5 and RCP4.5. Sentence was edited for clarity.
60580	130	10	130	22	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – text was removed.
2340	130	15	130	15	± 5%? [Greece]	Rejected - text is correct
2342	130	18	130	22	Under which RCP scenarios do these findings occur? [Greece]	Not applicable – Text was removed.
54386	130	22	130	22	One should stress that PV decline in Europe is uncertain because RCMs and GCMs do not give the same change signal (Bartok et al., 2017) [Robert Vautard, France]	Not applicable – Text was removed.
54388	130	22	130	22	A very recent study (Tobin et al., 2018, see below, was submitted on time for SR15) exmined the combined impacts of solar, wind, hydro and thermoelectric power production in Europe under 1.5, 2 and 3 degrees. In a 1.5 degree it estimates the effects twice less than at 3°C warming in Europe. Climate Change affects negatively electricity production in many countries. REFERENCE: Tobin, I., Greuell W., Jerez S., Ludwig F., Vautard R., van Vliet M.T.H., and Bréon F.-M., 2018: Vulnerabilities and resilience of European power generation to 1.5°C, 2°C and 3°C warming, Environ. Res. Lett., in press [Robert Vautard, France]	Accepted – recommended literature added
6352	130	25	133	20	The section is rather unbalanced - most likely due to an underrepresentation of studies on the global south, but this could be pointed out in the text - and has a predominant focus on Europe, US and to some extent the Caribbean. The section does not completely succeed in outlining differences between 1.5 and 2 degrees and the structure and messaging could be improved. [Anne Olhoff, Denmark]	Taken into account – The relevance of available studies to the 1.5/2 degree thresholds has been strengthened where possible. Regional imbalance is indeed due to persistent regional information gaps, including, but not exclusively the global south. This was identified in the AR5 and several peer reviewed papers as a sectoral gap that needs to be addressed.
18470	130	25	133	20	The section is rather unbalanced - most likely due to an underrepresentation of studies on the global south, but this could be pointed out in the text - and has a predominant focus on Europe, US and to some extent the Caribbean. The section does not completely succeed in outlining differences between 1.5 and 2 degrees and the structure and messaging could be improved. [Andrea TILCHE, Belgium]	Taken into account – The relevance of available studies to the 1.5/2 degree thresholds has been strengthened where possible. Regional imbalance is indeed due to persistent regional information gaps, including, but not exclusively the global south. This was identified in the AR5 and several peer reviewed papers as a sectoral gap that needs to be addressed.
35188	130	25	130	25	Following study should be cited under the section: he risk of losses in winter tourism demand increases under a 2 °C global warming and most affected are Austria and Italy (Damm et al., 2017) Andrea Damm, Wouter Greuell, Oskar Landgren, Franz Prettenthaler (2017), Impacts of 2 global warming on winter tourism demand in Europe, Climate Services, 7. [Shaukat Ali, Pakistan]	Taken into account – However, in order to achieve specified word count reductions, all country/region specific ski industry references were removed as they are covered by the global review paper by Steiger et al., 2017. The work of Damm et al., 2017 was also used by the Jacobs et al.-study and the results are included through that citation.
41444	130	27	130	48	literature review? [Lourdes Tibig, Philippines]	Noted – unclear what this comment refers to.
60582	130	27	131	16	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Taken into account – The relevance of available studies to the 1.5°C/2°C thresholds has been strengthened where possible, and those studies that only refer to higher emission/warming scenarios have been removed.
22228	130	30			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
7244	130	32	130	35	Time periods should be provided, especially given that the three studies quoted do not address the same time periods. [Samuel MORIN, France]	Rejected – All country/region specific ski industry studies were removed to achieve specified word count reductions. This comment on comparable time periods, while valid, is no longer relevant with all of the detailed studies removed.
22230	130	39		44	When expressing increases/decreases in %, please add symbol +/-, as in line 48 in next page or lines 25-26 in page 132. [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
2344	130	40	130	41	It should be mentioned that larger ski areas are usually equipped with snowmaking, and this is the main reason for their lower vulnerability. [Greece]	Rejected – This is not actually the case in many ski markets where snowmaking is universal. The content on snowmaking capacity (current / future) has been reduced to a sentence to achieve specified word count reductions.
16398	131	3	131	7	Examples of diverse tourism impacts include.... compromised tourism in Australia' means what? Please be more exact. What tourism impacts have been actually observed? According to the Great Barier Reef Marine Park Authority http://www.gbrmpa.gov.au/visit-the-reef/visitor-contributions/gbr_visitation/numbers, 2.34 million visit-days were recorded for the park in 2016-17, about the same as in the previous year and around 15 per cent higher than in 2014-15. [Australia]	Not applicable – Sentence was removed.
8754	131	10	131	11	that reduced tourism revenue to storm damaged destinations will exceed $US600 in 2017 and early 2018.' $US600 CANT BE Right. [Robert Shapiro, United States of America]	Taken into account – This was a typing error, "millions" was missing. However, this sentence was removed to achieve word count reductions.
41624	131	11			Change "$US600" to "600 USD" [Czech Republic]	Editorial – copyedit to be completed prior to publication
24172	131	19	133	29	Please check the following refererence: Scott, D., Steiger, R., Rutty, M., & Fang, Y. (2018). The changing geography of the Winter Olympic and Paralympic Games in a warmer world. Current Issues in Tourism, 1-11. [Mustafa Tufan Turp, Turkey]	Accepted – the recommended publication was reviewed and included to support and update the previous reference.
24174	131	19	133	29	Please check the following refererences: “Impact of Climate Change on Ski Resorts in Northeast Turkey: A Dynamical Downscaling Approach”, Osman Cenk Demiroglu, Mustafa Tufan Turp, Tugba Ozturk, Mehmet Levent Kurnaz, Atmosphere, 7, 52 (2016). [Mustafa Tufan Turp, Turkey]	Taken into account – The recommended literature was reviewed. However, to achieve specified word count reductions, all country/region specific ski industry references were removed as they are covered by the global review paper by Steiger et al., 2017.
24176	131	19	133	29	Please check the following reference: Climate Change and Coastal Tourism: Recognizing Problems, Meeting Expectations & Managing Solutions; Jones, A., Phillips, M., [Eds.]; Centre for Agriculture and Biosciences International (CABI), (2018). [Mustafa Tufan Turp, Turkey]	Accepted – the recommended publication was reviewed and included
24178	131	19	131	29	Please check the following reference: Sustainable Mountain Regions: Challenges and Perspectives in Southeastern Europe; Koulov, B., Zhelezov, G., [Eds.]; Springer: Basel, Switzerland, pp. 77–88 (2016). [Mustafa Tufan Turp, Turkey]	Taken into account – The recommended publication was reviewed but not included in the section due to limited relevance and major reductions in all references to achieve specified word limits.
53426	131	19	131	19	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial – copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53544	131	19	131	19	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial – copyedit to be completed prior to publication
60584	131	19	133	29	This section should note that other socio-economic factors and development choices have a substantial impact on tourism, and given that there is limited research on temperature impacts on tourism sectors, that should be incorporated into the conclusions of this section unless further justification can be provided. [United States of America]	Taken into account – Agree and the point that understanding the interactions of climate change and other major drivers impact tourism has been emphasised.
22232	131	28			remove double comma in "e.g.,," [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44578	131	28	131	28	climate sensitive (e.g.,, urban sightseeing) (Scott et al., 2016a). [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
44580	131	29	131	34	Spacing and formatting issues [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
2346	131	46	131	49	Given that in the previous paragraph the reader gets the idea that it cannot be concluded whether summer conditions for tourism in Southern Europe will significantly deteriorate under +2 oC the inclusion of only this reference on reduced future tourist demand in southern Europe creates some inconsistency. Apart from this study dated from 2014, aren't there other studies showing different results? If not, it should be noted that there are not recent studies on this issue and thus it cannot be concluded that future tourism demand in southern Europe under +2 oC will be reduced because of climate change. [Greece]	Taken into account – This is a valid point. Some evidence indicates tourists have much higher thermal thresholds than the TCI index assumes. The TCI index has been criticized repeatedly in the literature, but that is not the mandate of this summary. The detailed / critical studies on thermal preferences were removed to achieve specified word counts. However, the uncertainties of estimates that utilize the TCI have been highlighted in the revised section.
22234	131	48		49	In order to facilitate a standard for comparison and also to facilitate the reading, currencies must be converted into USD. [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44582	131	48	131	49	billionyr-1 or "billion/year"? [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
44584	132	2	132	2	across the park system by 8 to 23%) and [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
35190	132	4	132	4	Decrease is grammatically correct instead of decreases in the sentence. [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
60586	132	7	132	13	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Taken into account – The relevance of available studies to the 1.5°C/2°C thresholds has been strengthened where possible, and those studies that only refer to higher emission/warming scenarios have been removed.
648	132	15	132	36	This paragraph is too long and the detail here is excessive. Since there are other more relevant aspects that should be included in this chapter this text could be much reduced. [Maria Jesus Iglesias Briones, Spain]	Accepted – text was revised and condensed; statements that were not specific to 1.5°C/2°C were removed.
7246	132	15	132	36	I find it very difficult to extract information relevant to the 1.5 vs 2°C global warming assessment, which should form the basis of this report. Why are results from RCP 4.5, RCP 8.5 etc. provided as such, without a reference to the corresponding global warming level ? In the current state, this paragraphs short fall in providing added value regarding especially the scope of the current report, with respect to recent reviews (e.g. Steiger et al., 2017). This paragraph is not formulated as an assessment. [Samuel MORIN, France]	Taken into account – The relevance of available studies to the 1.5°C/2°C thresholds has been strengthened where possible, and those studies that only refer to higher emission/warming scenarios (i.e., not compare lower and higher emission/temperature futures) have been removed. In additions, In order to achieve specified word count reductions, all country/region specific ski industry references were removed as they are covered by the global review paper by Steiger et al., 2017.
7248	132	15	132	36	This paragraph does not refer to 1.5 vs 2 °C impacts, which is a pity and makes it fall outside the scope of this report. Although, according to Steiger et al. (2017) impacts of climate change on ski tourism should not be based on studies ignoring snowmaking (some are cited here, however), it could be worth refering to recent studies addressing the local impact of 1.5 / 2°C warmer world quantitatively in terms of local meteorological and natural snow conditions. Verfaillie et al. (The Cryosphere Discussions 2017, rievised on February 12 2018, with minor revisions required - available upon request), processed 30 EUROCORDEX GCM/RCM pairs spanning RCP2.6, RCP4.5 and RCP 8.5, which were downscaled against a local reanalysis and used to feed the detailed snowpack model Crocus. Results in terms of 30 years average 2010-2040, 2040-2070 and 2070-2100 were compared to results of the 1986-2005 reference period, in terms of mean winter snow depth, snow season duration (date of beginning/end), peak snow water equivalent , number of days above given thresholds etc. at 1500 m altitude in the Northern French Alps. Using global temperature of the driving GCMs of the period 1850-1880 as a pre-Industrial baseline, the change in 30-years average mean winter snow depth (using the reference 1986-2005) is -24%+/- 12 for 1.5°C global warming, and -32% +/- 10 for 2°C global warming. Changes were also computed for peak SWE (-18% vs -23%) and for (natural snow) season duration (-23 days vs -34 days) etc. Note also significant change for winter pecipitation, but significant changes for local temperature changes. Changes were found to be linear wrt global warming rate, neither depending on the RCP nor on the lead time into the 21st century (no or very limited lag / histeresis at this altitude/location where snow is exclusively seasonal). Recent articles from Marty et al. (The Cryosphere, 2017) or Terzago et al. (The Cryosphere, 2017), can provide further hints into this issue, although they do not explicitly provide direct linkages between local changes in snow conditions and global warming level. Along with the Verfaillie et al. (2017) paper, none of them should be used directly used to infer the impact of climate chane on ski resorts operations, because they ignore snowmaking and other snow management activities, but it may be worth referring to them as climate boundaries for this sector, in a way more akin to the scope of this report than the paragraph on ski tourism is currently formulated. [Samuel MORIN, France]	Rejected – Papers that are in review are not available to the writing team. If this study is accepted, it does provide some useful context, but would belong in the cryosphere section, as it does not include snowmaking (thus does not reflect the operating realities of the industry) and does not provide insights into key operating thresholds needed by the ski industry.
8756	132	17	132	17	1.9 mill annual winter overnight stays' ??million?? [Robert Shapiro, United States of America]	Accepted – statement was corrected.
8758	132	17	132	17	in Europewhen global' should be 'in Europe when global' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
2348	132	18	132	18	Publication year of this reference? [Greece]	Accepted – reference was corrected.
22236	132	41		42	If I am understanding it well, the authors are using 130 UNESCO cultural World heritage sites to compare the risk of sea level rise and found that 6% will be affected if the increase is up to 1.5ºC and 19% if the increase goes up to 2ºC. The point is that 6% of 130 makes 8 sites and 19% of 130 makes 25 sites, but in the text is says 40 and 136 respectively. Moreover, 136 is above the total number of sites tested (130)! Please correct or explain it better. [LUIS VALDES, Spain]	Accepted – This was a typo, the number of World Heritage Sites examined was 720. The sentence has been revised to correct this error and to specify the number of impacted sites at warming of 1°C, 2°C and 3°C.
16400	132	47	132	49	The authors should check that the study on which this statement is based has sufficient scientific rigour and meets IPCC standards. The authors are a self-proclaimed "think tank" with doubtful claims to scientific rigour. In addition, the study has not been peer reviewed. Regardless, if the results were taken at face value, the net effects are limited as around 90% of the affected tourists identified by the Australia Institute planned to visit a different region in Australia as an alternative. [Australia]	Rejected – While consistent with the peer-reviewed study of Piggott-McKellar et al, this study and sentence has been removed, until a peer reviewed study with similar conclusions / estimates is available.
22238	132	47			insert space between "2017.If" [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44586	132	47	132	49	Spacing issue in 2 places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
2350	133	3	133	5	This is somehow contradictory to what is written in page 131 lines 37-41. [Greece]	Taken into account – statements were revised.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
8760	133	4	133	4	in the most European countries,' should be 'in most European countries,' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
22240	133	5			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted – references were corrected.
44588	133	5	133	6	Year is missing in 2 places [Rita Man Sze Yu, China]	Accepted – references were corrected.
2352	133	22	133	29	The key message is not fully clear and does not refer to 1.5 oC which is the topic of this Special Report. [Greece]	Taken into account – The relevance of available studies to the 1.5°C/2°C thresholds has been strengthened where possible, and those studies that only refer to higher emission/warming scenarios have been removed.
9718	133	24	133	29	There is a further indirect channel of climate change induced impacts on tourism via the impacts of mitigation on transport cost. [Mustafa BABIKER, Sudan]	Rejected – It is agreed that this is one of the 4 impact pathways set out by Scott et al. 2012 and is potentially an important impact if international aviation is required to abide by its emission reduction pledges. However, mitigation policy was beyond the scope of this section.
46042	133	25	133	27	'Increasing temperatures will directly impact climate dependant tourism markets, including sun and beach and snow sports tourism, with lesser impact on other tourism markets that are less climate sensitive (high confidence)'. Since this sentence expresses an implicitness I would not consider it as "Key Message". [Tim Rixen, Germany]	Not applicable – Not sure I understand the comment correctly, but nonetheless this sentence was removed from the key points/summary and added to the body text of the section.
7250	133	27	133	29	Sentence starting with "The translation …" is unclear. Is is that there is limited scientific evidence to assess the "translation", or is it that the translation it self is limited (which I don't exactly understand). What does "geographically limited" means when applied to a "translation" ? Are effects/impacts weaks ? Other meaning ? This sentence would certainly benefit from a rephrasing/clarification. [Samuel MORIN, France]	Taken into account – This sentence has been revised. It is the limited evidence of the wide range of potential impacts that precludes robust estimates of impacts to the tourism sector even in information rich regional markets like Europe, and the absolute knowledge gaps in many other regional markets that preclude global estimates of impacts on the sector.
2360	133	32	134	18	The information on transporation is very limited and does not cover all basic transportation means, especially road transport. In addition, there is little information on the risks under 1.5-2 oC. [Greece]	Taken into account – Text was edited for clarity and relevance, and literature constraints were highlighted.
6354	133	32			This sub-section is substantially weaker than the other subsections and the heading in line 49 misleading as the subsection cannot make the distinction between 1.5 and 2 degrees based on the available literature. [Anne Olhoff, Denmark]	Taken into account – Limited literature is available on specific impacts of 1.5°C/2°C on transportation. The heading title was changed.
9392	133	32	134	18	Sec. 3.4.9.3 - Although some of the factors associated with risk to transportation are mentioned briefly for 3 regions, there is no real discussion regarding these risks. It is not clear why there would be aircraft weight restrictions. The discussion focusses mainly on shipping and says notihing about land-based transportation (what do changes in permafrost or potential flooding etc. mean for these systems). [Sharon Smith, Canada]	Taken into account – Space limitations preclude adding more explanation. Literature limitations highlighted.
18472	133	32			This sub-section is substantially weaker than the other subsections and the heading in line 49 misleading as the subsection cannot make the distinction between 1.5 and 2 degrees based on the available literature. [Andrea TILCHE, Belgium]	Taken into account – Limited literature is available on specific impacts of 1.5°C/2°C on transportation. The heading title was changed.
2354	133	34	133	46	Still, aren't there any studies presenting quantitative findings on observed impacts which could be mentioned and briefly presented here? [Greece]	Taken into account – Additional references were included.
41446	133	34	133	46	not observed impacts [Lourdes Tibig, Philippines]	Taken into account – Heading title was changed and information removed
22242	133	35		51	Please review and correct spaces between words (e.g. lines 35, 37, 38, 50, 51) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
60588	133	35	133	46	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – statement edited for clarity.
44590	133	37	134	8	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
8762	133	38	133	38	on the locationof the' should be 'on the location of the' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
22244	133	46			Add full stop to be consistent with previous bullet points 1 and 2, which ended by ; [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
53428	133	49	133	49	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial – copyedit to be completed prior to publication
53546	133	49	133	49	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial – copyedit to be completed prior to publication
8764	133	50	133	50	supports thatincreases in global temperatureswill impact' should be 'supports that increases in global temperatures will impact' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
8766	133	51	133	51	Increasesin mean' should be 'Increases in mean' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
60590	133	51	134	2	This statement should be framed in comparison to 1.5°C of warming to remain within the scope of the report. [United States of America]	Not applicable – Sentence was removed.
8768	134	2	134	2	costs forairlines' should be 'costs for airlines' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
22246	134	2		47	Please review and correct spaces between words (e.g. lines 2, 6, 7, 8, 13, 35, 39, 47) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
35992	134	2	134	2	Add space between 'for' and 'airlines' [India]	Editorial – copyedit to be completed prior to publication
2356	134	5	134	6	What is it meant by 'more shipping'? How this will contribute to temperature rise (via GHG emissions?) and how was this contribution measured? [Greece]	Accepted – statement edited for clarity.
8770	134	7	134	7	months underRCP4.5 and' should be 'months under RCP4.5 and' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
61918	134	10	134	14	This impact on transportation may be captured in key findings incl. For the executive summary of the chapter. I think that the chapter does not sufficiently highlight the implications of 1.5°C for the Arctic region and for the sectors and other affected regions. This could be highlighted in a box, as for other "hotspots" of changes for a 1.5°C warmer world. [Valérie Masson-Delmotte, France]	Taken into account – Parts of paragraph were removed and the rest was edited for clarity and relevance.
2358	134	16	134	16	Aren't there other, recent, references available apart from Arent et al., 2014? [Greece]	Taken into account – Relevant references were added, literature limitations were highlighted.
60592	134	17	134	18	Provide additional information to justify the conclusion that impacts are projected to be "negative". [United States of America]	Not applicable – Sentence was removed.
6356	134	21	134	41	See comment above, which also applies to the water subsection. [Anne Olhoff, Denmark]	Taken into account – Text was revised – Sentence removed
10540	134	21	134	41	Large text was overlapping in this section. Some information is repeated in different places. The text needs to be 'trimmed' to avoid the overlapping [Hong Yang, Switzerland]	Taken into account – Text was revised – Section edited for clarity
18474	134	21	134	41	See comment above, which also applies to the water subsection. [Andrea TILCHE, Belgium]	Taken into account – Text was revised – Sentence removed
44592	134	23	134	30	Add a comment on Cape Town? [Rita Man Sze Yu, China]	Rejected - This paragraph presents AR5 information.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
2362	134	28	134	29	The magnitude of impact on water resources is not a matter of income, but depends on the geographical location and future local climatic conditions, on the number and size of economic activities which are water-served/water-affected and the ability for adaptation. It is the latter which is affected by income (as well as by other factors). Therefore, the sentence should be changed so that it reflects that the adaptive capacity is affected by many socio-economic factors, including income. [Greece]	Taken into account – Text was revised.
8772	134	30	134	30	to preparefor anticipated' should be 'to prepare for anticipated' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35994	134	30	134	30	Add space between 'prepare' and 'for' [India]	Editorial – copyedit to be completed prior to publication
2364	134	33	134	41	This sub-section 3.4.9.4.3 should present information on the risks to water systems and infrastrucure (since the section 3.4.9 is on Key economic sectors and services) and not just on flooding. [Greece]	Taken into account – Text was revised.
10446	134	33	134	41	I wonder if any of these studies is actually specific to the 1.5 vs 2°C question given that they come under the heading projected risks at 1.5 vs 2°C? [Christopher Reyer, Germany]	Taken into account – Text was revised.
24180	134	33	134	33	1.5 vs 2 ---> 1.5 vs. 2 [Mustafa Tufan Turp, Turkey]	Editorial – copyedit to be completed prior to publication
35192	134	33	134	33	Following relevant study should be cited in the section: Floods have affected almost 18 million people in Europe and these events caused loss of 133 billion USD . References: Guha-Sapir D, Below R and Hoyois P(2017) EM-DAT: The Emergency Events Database ("http://www.emdat.be" www.emdat.be) [Shaukat Ali, Pakistan]	Rejected. 3.4.9.4.2 is merged into 3.4.2.
53430	134	33	134	33	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial – copyedit to be completed prior to publication
53548	134	33	134	33	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial – copyedit to be completed prior to publication
18476	134	34	134	41	How do these projected costs compare to what is expected under 1.5 and 2 scenarios? Only BAU and 3 degress reported? [Andrea TILCHE, Belgium]	Taken into account – Text was revised.
22248	134	34			If we are talking about "low-, middle- and high-income countries", it will be more sounding to say "all countries, independently of their incomes," [LUIS VALDES, Spain]	Not applicable – Statement was removed.
41626	134	36			Change "US$1.5 billion" to "1.5 billion USD" [Czech Republic]	Editorial – copyedit to be completed prior to publication
8774	134	39	134	39	incremental costsof flood' should be 'incremental costs of flood' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
41628	134	39			Change "US$2.6 billion" to "2.6 billion USD" [Czech Republic]	Editorial – copyedit to be completed prior to publication
41630	134	39	134	40	Change "US$54 million" to "54 million USD" [Czech Republic]	Editorial – copyedit to be completed prior to publication
44594	134	40	134	47	Spacing issue in 2 places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
61920	134	40	134	40	a cross section assessment of changes for deltas is needed (also Mekong etc). It includes sea level, extremes, water etc. [Valérie Masson-Delmotte, France]	Taken into account – this topic is covered in Cross-Chapter Box 11.
2366	134	44	140	13	Section 3.4.10 is too long (5.5 pages), and creates imbalance with other sections of the chapter. [Greece]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
18478	134	44	140	42	The section could be streamlined - several sub-sections, for instance, address impacts through agriculture, or disasters, migration and conflict. Indeed, climate risks interact and cascade (last sub-section). The overlaps and repetitions make the text cumbersom and difficult to extract key messages and conclusions. [Andrea TILCHE, Belgium]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
60594	134	44	140	44	Section 3.4.10 would also benefit from an increased focus on how impacts under 1.5°C scenarios differ from 2°C scenarios and an inclusion of a clear indication of levels of confidence/uncertainties for statements throughout. [United States of America]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
35194	135	1	135	1	Following relevant study should be cited in the section: At low latitudes where the dominant location is of world's poorest people will be exposed to more frequent daily temperature extremes at much lower levels of warming than their wealthier counterparts. References: Harrington, L. J., Frame, D. J., Fischer, E. M., Hawkins, E., Joshi, M. and Jones, C. D.: Poorest countries experience earlier anthropogenic emergence of daily temperature extremes, Environ. Res. Lett., 11(5), 055007, doi:10.1088/1748-9326/11/5/055007, 2016. [Shaukat Ali, Pakistan]	Only references that specifically discussed 1.5/2 are included.
43230	135	1	135	28	Suggested improvement: A key concept to get across would be that "climate change and natural hazards prevent people escaping poverty because they prevent asset accumulation." (In more detail, from Byers et al: "Escaping poverty, and thus reducing one's vulnerability, can be particularly difficult due to the frequency of natural and climate hazards, preventing asset accumulation (Carter and Barrett, 2006) and impacting negatively on prices, productivity and opportunities (Hallegatte et al., 2016)." [Edward Byers, Austria]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed. We have coordinated with and pass this comment to Section 5.2.2.
43232	135	1	135	28	Suggested improvement: Climate change threatens not only those that are poor, but also a large portion of the population (typically lower-middle class) that are "vulnerable to poverty" .ie. If you suffered from a climate change extreme event (or lost your job), you would be likely to fall into poverty. "lack the economic stability and resilience to shocks that characterizes middle-class households " Lopez-Calva & Ortiz-Juarez, World Bank, 2011. [Edward Byers, Austria]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed. We have coordinated with and pass this comment to Section 5.2.2.
43252	135	1	135	28	I would suggest reading section 5.2.2 of Chapter 5 - it is similar in narrative and very well written and could be used for further inspiration for this section. [Edward Byers, Austria]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed. We have coordinated with Section 5.2.2.
60596	135	1	135	28	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
31080	135	2	135	11	some big statements are made on how CC will enhance poverty. Yet virtually all the refs are by one person as a lead or 2nd author, i.e. Hallegatte. Big conclusions need a bit more diversity of authorship and approaches that arrive at these conclusions. [James FORD, Canada]	Not applicable – The section was deleted. Sentences that are not specific to 1.5°C or 2°C were removed.
60598	135	2	135	11	It is surprising not to see a reference here to the dependence of the poor and their livelihoods on natural resources and ecosystems, many of which are at risk from climate impacts. There is ample documentation of this dependence in the literature, both peer-reviewed and grey. [United States of America]	Not applicable – The section was deleted. Sentences that are not specific to 1.5°C or 2°C were removed.
22250	135	6		45	Please review and correct spaces between words (e.g. lines 6, 22, 23, 26, 41, 45) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44596	135	6	135	45	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49968	135	6	135	7	Instead of using poor, can we use low income communities and if possible provide the definition or thresholds. [Perdinan Perdinan, Indonesia]	Not applicable – The section was deleted. Sentences that are not specific to 1.5°C or 2°C were removed.
43234	135	7	135	8	I would add loss of assets or personal goods… i.e. all of vulnerable poor people's wealth are in bricks , assets and crops that can be wiped out by a flood - conversely rich people store their wealth in banks. [Edward Byers, Austria]	Not applicable – The section was deleted. Sentences that are not specific to 1.5°C or 2°C were removed.
43236	135	7	135	8	Byers et al found disproportionate increases in the number of vulnerable people exposed to multi-sector climate impacts (using 14 indicators across water / energy / land sectors) when compared to the global population as a whole. Whilst the global population of "exposed and vulnerable" (with income <US$10 / day 2011PPP) approximately doubles between 1.5 to 2.0°C (depending on SSP scenario), in Southern and Western African regions the change factor is ~5x, and in East Africa is projectedup to a 10x increase. (Supplementary information, Table S6, section 4). [Edward Byers, Austria]	This reference is cited in section 3.4.11
50698	135	7	135	8	Byers et al found disproportionate increases in the number of vulnerable people exposed to multi-sector climate impacts (using 14 indicators across water / energy / land sectors) when compared to the global population as a whole. Whilst the global population of "exposed and vulnerable" (with income <US$10 / day 2011PPP) approximately doubles between 1.5 to 2.0°C (depending on SSP scenario), in Southern and Western African regions the change factor is ~5x, and in East Africa is projectedup to a 10x increase. (Supplementary information, Table S6, section 4). [Bastiaan van Ruijven, Austria]	This reference is cited in section 3.4.11
7210	135	13	135	28	There is significant overlap with section 5.2. Agreement was that Ch3 would focus on global to regional and Ch5 on sub-regional to households and individuals. There are other overlaps in the following pages as well (e.g. e.g. heat waves in particular cities on p 161 lines 39-44). [Petra Tschakert, Australia]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed. We have coordinated with section 5.2.2.
12102	135	21	135	22	annual average *global* temperature? [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable – this sentence was removed because it was not specific to 1.5°C or 2°C.
8776	135	23	135	23	warming couldreshape the' should be 'warming could reshape the' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35996	135	23	135	23	Add space between 'could' and 'reshape' [India]	Editorial – copyedit to be completed prior to publication
12104	135	24	135	27	Not a full sentence - the extent will increase? [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable – Statement was removed.
35196	135	33	135	33	Following studies should be cited under the section : The International Organization for Migration (IOM) outlined the environmental degradation as the link between climate change and migration. Migration pressure increases as the climate change progresses due to increase in environmental degradation.(Study commissioned by Greenpeace Germany 'Climate change, Migration and Displacement(2017)) [Shaukat Ali, Pakistan]	Taken into consideration – Definitions are provided in the Glossary of this Special Report.
49480	135	33	135	33	Needs a specific emphasis in this section on small islands here with respect to migration (historical and future change). The future emphasis is generally on sea-level rise (plus development), but historically there has always been migration in small islands. [Sally Brown, United Kingdom (of Great Britain and Northern Ireland)]	Taken into consideration – Please refer to Box 3.5 "Small island developing states (SIDS)".
12118	135	35	137	24	This whole section is not very 1.5 specific - could cut large parts out to shorten report. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
30514	135	35	135	35	Please define migration and displacement [France]	Taken into consideration – The definitions are provided in the Glossary of this Special Report.
60600	135	35	137	24	This section is not 1.5°C temperature scenario specific and should therefore be removed. Further, given the statement on page 135, line 49 – "No studies specifically explored the difference in risks between 1.5 and 2°C on human migration" – there is insufficient rationale for this section to be included as it does not have sufficient information to contribute to the mission of this report. [United States of America]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
22252	135	36			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
22254	135	38			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
60602	135	45	135	45	immobility"" is linked/conflated with ""trapped"". These two terms are not synonymous: 'immobility' means a household that voluntarily chooses to stay. This may be quickly remedied by adding the term forced in front of the word. Oftentimes, the choice to stay is not always the most adaptive (Black et al., 2011). Additionally, the word 'trapped' was very famously coined and written about by Richard Black et al. in the UK's Foresight Report on Environmental Change and Migration. These works should be cited (Black et al., 2012; Foresight, 2011). [United States of America]	Not applicable – this sentence was removed because it was not specific to 1.5°C or 2°C.
12120	135	46	135	47	Are there other viable adaptation strategies? How feasible is a "planned, safe, dignified and orderly migration"? [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable – this sentence was removed because it was not specific to 1.5°C or 2°C.
34790	136		136		Where is the section on migration in the Pacific and Small Islands? There are sections on migration Globally, in South America, Africa and Asia. However, the Pacific and Small Islands are notably missing from this section. The small islands should be included in a separate section if possible, as there is a range of literature available and this issue of particularly important to small islands. E.g. Farbotko and Lazrus (2012); Locke (2009); Mortreux and Barnett (2009); [Helena Wright, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – Please refer to Box 3.5 "Small island developing states (SIDS)".
12928	136	3			…1.5°C and 2.0°C… everywhere else it is listed as 2°C [Marie-Jeanne S. Royer, Canada]	Editorial – copyedit to be completed prior to publication
22256	136	6		48	Please review and correct spaces between words (e.g. lines 6, 10, 14, 19, 24, 28, 29, 37, 38, 48) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
44598	136	6	136	38	Spacing issue in numerous places [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication
2422	136	18	137	12	What was the contribution of socio-economic factors on outmigration in the regions mentioned? The section, as it stands, does not help the reader understand what is the relative weight of climate-factors vs socio-economic factors. If such an information cannot be derived from the studies included as references, then it should be stated explicitly. In addition, it does not provide information on the impact under 1.5 oC which is the topic of this Special Report. [Greece]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
8778	136	19	136	19	A1°C increase' should be 'A 1°C increase' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
8780	136	23	136	23	same databased, but' should be 'same database, but' IS DATABASE CORRECT ?? [Robert Shapiro, United States of America]	Not applicable – Statement was removed.
12106	136	23	136	25	Not very layperson-friendly - can this be rephrased for clarity e.g. refer to explicit increases in precipitation, not "an increase in precipitation anomalies" [United Kingdom (of Great Britain and Northern Ireland)]	the sentence referred to an increase in precipitation anomalies, which is not the same as an increase in precipitation. The term anomalies appears about a dozen times in the chapter, so we decide not to make the change.
22258	136	28			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
12108	136	36	136	37	Again, use simple, clear language where possible and keep non-expert reader in mind e.g. "increase in temperature" not "positive maximum temperature anomalies" - same goes for rest of this section. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
2420	137	1	137	1	It is better to say 'Outmigration in the Philippines was found to have a positive correlation with summer temperature, …' [Greece]	Not applicable – Statement was removed.
35198	137	1	137	4	The word "emigration" should be appropriate instead of outmigration. [Shaukat Ali, Pakistan]	Changed.
41448	137	1	137	3	In the Philippines , outmigration had not been dependent on temperature. [Lourdes Tibig, Philippines]	Not applicable – this sentence was removed.
22262	137	2		51	Please review and correct spaces between words (e.g. lines 2, 7, 12, 18, 20, 21, 22, 35, 50, 51) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
22260	137	3			Please note that a comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
46796	137	3	137	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account – use of Uncertainty Language was revised.
2424	137	14	137	15	Theorising on the pathways through which climate will impact on migration appears most 15 strongly supported in literature for a pathway through agriculture…': this sentence is unclear. [Greece]	Not applicable – this sentence was removed.
12110	137	14	137	16	Please rephrase for clarity and brevity e.g. "Migration appears to be most strongly affected by climate via agriculture, suggesting the countries most likely to see a climate signal in migration are those from the global south with high rural unemployment (Coniglio and Pesce…)..." [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable – Statement was removed.
46798	137	16	137	16	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account – use of Uncertainty Language was revised.
2426	137	18	137	18	Temperature increases can INCREASE migration..' [Greece]	Not applicable – Statement was removed.
8782	137	18	137	18	Temperature increasescan reduce migration' should be 'Temperature increases can reduce migration' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
12112	137	18	137	21	I don't understand what this means [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable – this sentence was removed.
28422	137	18	137	18	Please clarify that the text refers to the phenomenon of "trapped populations". In its current form, the statement „Temperature increases can reduce migration" is confusing and may be perceived as inconsistent with the overall message of the chapter. [Germany]	Not applicable – this sentence was removed.
35200	137	18	137	18	The spacing is missing between words "increasecan" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
2428	137	19	137	19	Instead of 'strengthen the incentives to migrate to cities' it is better to say 'motivate people to migrate to cities' [Greece]	Not applicable – Statement was removed.
2430	137	19	137	21	Why temperature increases 'strengthen the incentives to migrate to cities…., or encourage transformation towards more urban and productive economies and increase emigration'? [Greece]	Not applicable – this sentence was removed.
8784	137	20	137	20	and encouragea transformation' should be 'and encourage a transformation' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35202	137	20	137	20	The spacing is missing between words "encouragea" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
22264	137	21		23	Please note that a comma must be inserted in between of the authors names and the year of publication (several cases in lines 21, 22 and 23) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
2432	137	26	137	26	The title should be 'Climate-related disasters' (as there are also non-climate physical disasters (e.g. earthquakes, tsounamis) which are not relevant to this report. [Greece]	Yes. We changed the term into climate-related disasters / environmental disasters
2434	137	26	138	29	Almost the whole section presents figures for past climate-disasters in different regions, but does not 'translate' this information to expected risks under 1.5 or 2 oC. Only the last paragraph (p. 138, lines 25-29) touches upon this issue -which is the topic of this Special Report- but provides only one reference for this purpose. If the available literature does not allow to assess risks from climate-related disasters under 1.5 or 2 oC, this should be clearly stated. [Greece]	Not applicable – this sentence was removed.
6358	137	26	138	29	It is surprising that the section on disasters is unable to draw more on projected impacts and risks based on temperature scenarios. [Anne Olhoff, Denmark]	Not applicable – this sentence was removed.
18480	137	26	138	29	It is surprising that the section on disasters is unable to draw more on projected impacts and risks based on temperature scenarios. [Andrea TILCHE, Belgium]	Not applicable – this sentence was removed.
30516	137	26	137	26	« Disasters » Please change the structure of this section. Disasters and migrations are right now two subtitles with the same level of importance while the disasters section deals about migration. maybe: "direct CC and migrations" and "disasters and migrations" [France]	Taken into account – section was restructured.
60604	137	26	138	29	This is not specific to 1.5 or 2°C scenarios and should be removed. [United States of America]	Accepted – this sentence was removed.
30518	137	28	137	28	Is "disasters" used here as "Natural catastrophes"? [France]	Yes. We changed the term into climate-related disasters / environmental disasters
8786	137	29	137	29	In contrasts,' should be 'In contrast,' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
12114	137	35	138	2	These two paragraphs are quite repetitive and could be condensed e.g. "Displacement: Over the coming century, climate change is projected to increase the displacement of people (Cramer 2014). Displacement associated with disasters and conflicts is a gloabal issue, with three times more individuals displaced because of disasters than because of conflict (IDMC2017). Almost 230 million displacements have been recorded since 2008, an average of 25.3 milion a year, with 165.9 million people newly displaced in the five-year period 2008-2013 (IDMC 2017). Most displacements are triggered by weather- or climate-related disasters e.g. between 2011 and 2015, over 90% of displacements were related to climate and weather disasters such as storms, floods, wildfires and severe winter (IDMC 2017, NRC 2017)." [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
35998	137	35	137	44	All disaster related displacement cannot be attributed to climate change. There is a need for better attribution of natural diasaters to climate change. There is very low evidence that climate change is a driver for armed conflict. Attrubuting causal relationship between armed violence and climate change is conterproductive and diverts attension from the socio-economic, historical and political factors that are at the centre of such conflicts. [India]	Not applicable – this sentence was removed.
44602	137	35	137	35	Displacement:Over the 21st century climate change, is projected to increase the displacement of people [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
50550	137	35	137	36	Over the 21st century climate change, is projected to increase the displacement of people (Cramer et al., 2014a): While this seems plausible, I am not aware of any studies actually providing quantitative projections of disaster-induced displacement, let alone on a global scale. In particular, I do not find any support for the quoted statement in AR5 WG2 Chap. 18 (Cramer et al., 2014a), nor in Chapters 12 or 19 of that report. [Jacob Schewe, Germany]	Not applicable – this sentence was removed.
12122	137	38	138	29	Not very 1.5 specific, cut out some descriptive bits to shorten report. [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable – this sentence was removed.
22266	137	46			Numbers/figures on the magnitude of displacement are not fully consistent between pages 137 and 138. Please adjust. [LUIS VALDES, Spain]	Not applicable – this sentence was removed.
8788	138	1	138	1	million people was displaced' should be 'million people were displaced' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
32570	138	4	138	4	Change "Carribbean" to "Caribbean" [Rosanne Martyr-Koller, Germany]	Editorial – copyedit to be completed prior to publication
22268	138	10		49	Review and correct spaces between words (e.g. lines 10, 25, 28, 29, 35, 37, 39, 40…) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
32572	138	14	138	15	Another stark example is that of Barbuda, in which the entire island population was evacuated after Hurricane Irma. There has also been regional migration throughout the eastern OECS due to disasters. What kind of migration is this considered in this context? [Rosanne Martyr-Koller, Germany]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
50554	138	17	138	18	I think this sentence is ambiguous, and should be reworded for clarity. Suggestion: "They however found that globally, between 1980-2010, there was a 9% coincidence rate between armed-conflict outbreak and climatic disasters such as heat waves or droughts. In ethnically highly fractionalized countries in North and Central Africa and Central Asia, this rate was 23% (Schleussner et al. 2016)." [Jacob Schewe, Germany]	Taken into account – The sentence referred to here was on page 139 line 16–19 (rather than 138). The sentence is deleted since it does not address impacts on 1.5°C or 2°C.
35204	138	22	138	22	The spelling of Somalia is written incorrect. [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
8790	138	25	138	25	Using ascenario of' should be 'Using a scenario of' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
8792	138	25	138	25	potential forsignificant population' should be 'potential for significant population' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35206	138	25	138	28	The spacing is missing between words "ascenario, forsignificant, adisproportionately " [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
50552	138	26	138	26	Tropical populations may have to travel distances greater than 1000 km…: Since this refers to the speed with which populations would have to relocate over the course of several decades, I wonder if the word "travel" is misleading, and should be replaced by "move", "shift" or similar. [Jacob Schewe, Germany]	Accepted – sentence was revised with the suggested edit.
8794	138	28	138	28	Adisproportionately rapid' should be 'A disproportionately rapid' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
2444	138	31	140	13	The section as it stands provides too little information on the expected risks under 1.5 or 2 oC. [Greece]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
2436	138	33	138	33	The AR5 concluded THAT the detection…' [Greece]	Not applicable – Statement was removed.
12116	138	33	138	50	This paragraph is quite dense, could you condense it? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
30520	138	33	138	50	This statement is well balanced between both thesis [France]	Thank you.
36000	138	33	140	13	Entire conflict section may be deleted. It quotes literature purporting to investigate the relation between temperature increase and conflict. However it does not account for the fact that there is vast literature on conflict that see no connection whatsoever of conflict and climate. Without engaging with this literature, this section is written as if there is no counter-literature to the ones cited. [India]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
61922	138	33	139	40	A recent study has called for cautiousness in relating conflict to climate change due to sampling bias. Please also refer to this study (Adams et al, Nature Clim Change, 2018). [Valérie Masson-Delmotte, France]	Accepted – recommended literature added
41632	138	34			Italics for "low confidence" [Czech Republic]	Editorial – copyedit to be completed prior to publication
46886	138	34	138	34	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account – use of Uncertainty Language was revised.
22270	138	35		47	A comma must be inserted in between of the authors names and the year of publication (this affect to almost all the literature cited in this paragraph. Correct!) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
39938	138	45	138	45	It is suggested one more paragraph about the climate change impact water resources crises in Iran based on; DOI: 10.2166/nh.2015.143 and DOI: 10.2166/wcc.2016.045 [Hamidreza Solaymani Osbooei, Iran]	Rejected – References that are not specific to impacts of 1.5°C or 2°C were not included.
48284	138	45	138	45	It is suggested one more paragraph about the climate change impact water resources crises in Iran based on; DOI: 10.2166/nh.2015.143 and DOI: 10.2166/wcc.2016.045 [Iran]	Rejected – References that are not specific to impacts of 1.5°C or 2°C were not included.
47302	138	46	138	46	Carleton and Hsiang has not date listed. Is this 2014 or 2016? [Sarah Connors, France]	Accepted – reference was corrected.
47292	138	47	138	47	Burke 2015c is missing from the reference list. [Sarah Connors, France]	Accepted – reference was corrected.
13134	138	49	138	50	Delete the text "Some studies warn against deterministic positivist approaches towards linking extreme wheather or climate change directly with human security issues in general (Raleigh et al., 2014; Selby, 2014).". [Eleni Kaditi, Austria]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
8796	139	1	139	1	conflict at different' should be 'conflict in different' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
12124	139	1	139	24	Contradictory - you say imapct of drought on conflict is limited but then say there is a 9% coincidence rate with cliamte events such as heat waves and droughts. Similar issues throughout this paragraph. If paragraph was condensed and made more sense structurally then it would remove this problem. [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
30522	139	1	139	24	Surprisingly, in the previous section it is underlined that there are inconsistent results about the "link between climate change and conflicts" but here (l3-24), you give a lot of details about Hsiang and Burke thesis. This is a bit confusing for a non-expert reader. [France]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
8798	139	2	139	2	micro levelsuggest the' should be 'micro level suggest the' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
22272	139	2		50	Review and correct spaces between words (mutiple lines in this page) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
35208	139	2	139	2	The spacing is missing between words "levelsuggest" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
36002	139	2	139	2	Add space between 'level' and 'suggest' [India]	Editorial – copyedit to be completed prior to publication
8800	139	10	139	10	by 2 - 4oCby 2050' shoud be 'by 2 - 4oC by 2050' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
12126	139	10	139	12	What does this sentence mean and what does it have to do with climate change and conflict? [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
44604	139	12	139	12	millennium, (Hsiang and Burke, 2014). A one-standard deviation [Rita Man Sze Yu, China]	Editorial – copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
2438	139	13	139	13	Add 'On the other hand,' before 'Schleussner et al…', as the findings of this study contradict what is said in the previous sentences based on other studies. [Greece]	New sentence: Armed-conflict risks and climate-related disasters are associated in ethnically fractionalized countries, indicating there is no clear signal that environmental disasters directly trigger armed conflicts (Schleussner et al. 2016).
57094	139	13	139	22	missing spaces [AMANDINE PASTOR, France]	Editorial – copyedit to be completed prior to publication
2440	139	16	139	19	A 9% coincidence rate implies of very low R-square between armed-conflict outbreak and disasters such as heat waves or droughts. Therefore, in my view, the figures of coincidence presented here confirm the main finding of this study (i.e. that there is no clear signal that environmental disasters directly trigger armed conflicts); thus, the word 'however' in line 16 should be deleted. [Greece]	Taken into account – this statement was rephrased for clarity and accuracy.
12128	139	26	139	43	No mention of 1.5 here, could renove to shorten report [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
2442	139	28	139	29	Under which climate change scenario? [Greece]	Not applicable – Section was edited, statement was removed because the reference was not specific to 1.5°C or 2°C-
8802	139	29	139	29	changed-related' should be 'change-related' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
1016	139	30	139	34	Says “Wischnath and Buhaug (2014b) examined food production and conflict severity in India and found that a food production loss was associated with more severe civil violence, suggesting that food insecurity was the intermediate link between climate and conflict. Processes by which lower food production can escalate existing conflicts include lower opportunity costs for rebelling, increased opportunities for recruitment, and widespread social grievances”. The study linking food production in India and political violence lacks evidence, and are based on inadequate data and a flawed analysis - and hence should be removed from the report. Reasons are given below. The authors (Wischnath and Buhaug) prepare a statistical model based on the relationship between food production and political violence in India. They use this model to suggest increasing violence with future climate change. However, the data used to indicate political violence is incomplete, and results in giving spurious correlations with agriculture food production. For example, the India Sub-National Problem Set (ISPS) dataset they use includes only specific riots during 1980-2011 (not a consistent time series) and hence cannot be used for preparing the rate of violence or compare it to the food production. For example, Fig.1 in their study shows large number (>2000) of casualties coinciding with Bombay (1992) and Gujarat (2002) communal riots and near-zero causalities in other years – which has no link with food production or climate change. Also, the statement “Processes by which lower food production can escalate existing conflicts include lower opportunity costs for rebelling, increased opportunities for recruitment, and widespread social grievances” used in IPCC SR15 is a generalized assumption made by the authors (Wischnath and Buhaug) and is not based on any scientific data or analysis and need not hold true for India. Reference: Marshall, M. G., Sardesi, S., & Marshall, D. R. (2005). India Sub-National Problem Set Codebook, 1960-2004. Center for Systemic Peace. [Roxy Mathew KOLL, India]	Not applicable – Section was edited, statement was removed because the reference was not specific to 1.5°C or 2°C-
36004	139	30	139	34	To be deleted from the report. It says“Wischnath and Buhaug(2014b) examined food production and conflict severity in India and found that food production loss was associated with more severe civil violence, suggesting that food insecurity was the intermediate link between climate and conflict. Processes by which lower food production can escalate existing conflicts include lower opportunity costs for rebelling, increased opportunities for recruitment, andwidespread social grievances”.The study linking food production in India and political violence lacks evidence, and are based on inadequate data and a flawed analysis - and hence should be removed from the report. Reasons are given below. The authors (Wischnath and Buhaug) prepare a statistical model based on the relationship between food production and political violence in India. They use this model to suggest increasing violence with future climate change. However, the data used to indicate political violence is incomplete, and results in giving spurious correlations with agriculture food production. For example, the India Sub-National Problem Set (ISPS) dataset they use includes only specific riots during 1980-2011 (not a consistent time series) and hence cannot be used for preparing the rate of violence or compare it to the food production. For example, Fig.1 in their study shows large number (>2000) of casualties coinciding with Bombay (1992) and Gujarat (2002) communal riots and near-zero causalities in other years – which has no link with food production or climate change. Also, the statement “Processes by which lower food production can escalate existing conflicts include lower opportunity costs for rebelling, increased opportunities for recruitment, and widespread social grievances” used in IPCC SR15 is a generalized assumption made by the authors (Wischnath and Buhaug) and is not based on any scientific data or analysis and need not hold true for India. India has implemented right to food as one of the fundamental human rights. There is no significant signal of the association of climate change or climate variability with civil conflicts. These conflicts are related to the social, economic and political circumstances of the region and should not be attributed to climate change in any manner in any country. [India]	Comment duplicated – please see response to comment #1016
12130	139	36	139	44	Attempts to link to 1.5, please make more explicit [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
22276	139	36		44	A bit speculative, I would say. Moreover, it is contradicting the assert "there is weak and often inconsistent 1 connection between food production and violent conflict" in next page (lines 1-2) [LUIS VALDES, Spain]	This sentence is deleted
35212	139	36	139	36	Following studies should be cited under the section : Human-induced climatic change was a contributory factor in the extreme drought that was experienced within Syria before its civil war was human induced climate change which resulted into large-scale migration and caused socio-economic stresses that led Syria towards war. References: JanSelby, Omar S.Dahi, Christiane Fröhlich, MikeHulmee (2017), Climate change and the Syrian civil war revisited, 60, p. 232-244. [Shaukat Ali, Pakistan]	Taken into account – Sentences that are not specific to 1.5°C or 2°C were removed. References that pertain to 1.5°C/2°C were incorporated as applicable. Please also refer to Box 3.2: Mediterranean Basin and the Middle East droughts.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
36006	139	36	139	44	Climate change is being linked to Syrian crisis . There is very low evidence that climate change is a driver for armed conflict. Attrubuting causal relationship between Syrian crisis and climate change is counterproductive as well as a distraction that diverts attention from the socio-economic, historical and political factors that are at the centre of the conflict. References: 1) Gleditsch, N. P., & Nordås, R. (2009). Climate Change and Conflict: A Critical Overview. Die Friedens-Warte, Vol. 84, No. 2, 11-28. 2) De Châtel, F. (2014). The Role of Drought and Climate Change in the Syrian Uprising: Untangling the Triggers of the Revolution. Middle Eastern Studies, Vol. 50, No. 4, 521-535. 3) Gleditsch, N. P. (2012). Whither the weather? Climate change and conflict. Journal of Peace Research, Vol. 49, No. 1, 3-9. 4) Raleigh, C., & Urdal, H. (2007). Climate change, environmental degradation and armed conflict. Political Geography, Vol. 26, No. 6, 674-694. 5) Salehyan, I. (2008). From Climate Change to Conflict? No Consensus Yet. Journal of Peace Research, Vol. 45, No. 3, 315-326. [India]	Taken into account – Sentences that are not specific to 1.5°C or 2°C were removed. References that pertain to 1.5°C/2°C were incorporated as applicable. Please also refer to Box 3.2: Mediterranean Basin and the Middle East droughts.
8804	139	38	139	38	contributed tothe deterioration' should be 'contributed to the deterioration' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
40494	139	38	139	38	The spacing is missing between words "tothe" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
30524	139	39	139	42	This statement is too strong. See selby et al (2017) Climate Change and the Syrian Civil War Revisited. Political Geography, Vol. 61 (2017) [France]	Taken into account – Sentences that are not specific to 1.5°C or 2°C were removed. Please also refer to Box 3.2: Mediterranean Basin and the Middle East droughts.
50558	139	42	139	42	The reference Kelly et al. (2015b) doesn't exist in the bibliography. Perhaps there should be a reference to Kelley et al. (2017) instead. [Jacob Schewe, Germany]	Taken into account – reference was corrected.
8806	139	43	139	43	of conflictaround the' should be 'of conflict around the' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35210	139	43	139	43	The spacing is missing between words "conflictaround" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
163	139	46	140	13	This passage, on conflict and climate in Africa, is incoherent. There is much reporting of contrardictory views via a literature review but little if any discernible assessment. I have difficulty separating what may be the chapter author judgments from those found in the literature. A total rewrite is needed with a view toward either making some clear judgments or clearly stating where the disagreements reside and why. [Michael Oppenheimer, United States of America]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
12132	139	46	140	13	Link to 1.5 degrees or remove to shorten report [United Kingdom (of Great Britain and Northern Ireland)]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
22274	139	50			A comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
8808	140	1	140	1	productionin Sub-Saharan Africa, there is weak' should be 'production in Sub-Saharan Africa, there is a weak' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
43204	140	1	150	1	I would suggest merging the sections of 3.5.2 on the avoid impacts discussion directly into section 3.4, otherwise much of this seems repetitive. I have heard that there is a need to cut a lot of text and this could help with duplicate information , as well as make things more succinct. This way we have all the info on various sectors (e.g. aquatic ecosystems, coral reefs, heatwaves, etc) largely in the same place. [Edward Byers, Austria]	Taken into account – section was restructured.
43206	140	1	150	1	The second half of section 3.5 is interesting as it brings new perspective, e.g. sections on regional hotspots, tipping points, - and it will also be "go-to" information when someone is interested in a particular region as opposed to a sector. [Edward Byers, Austria]	Thank you.
35214	140	2	140	2	The correct expression is " The proposed linkages are the adverse weather patterns that cause …" [Shaukat Ali, Pakistan]	Not applicable – Statement was removed.
22278	140	3			I think that to say in the report that "may lead to coup d'etat and civil conflict" is risky and speculative and contradicting the assert "there is weak and often inconsistent connection between food production and violent conflict" in previous lines. [LUIS VALDES, Spain]	Taken into account – The section was shortened and rewritten. Sentences that are not specific to 1.5°C or 2°C were removed.
22280	140	3		42	Correct spaces between words (e.g. lines 3, 8, 13, 42) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
8810	140	8	140	8	colonial Nigeria,there was' should be 'colonial Nigeria, there was' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
10542	140	18	140	25	This section should follow section 3.4.8. [Hong Yang, Switzerland]	Rejected – it was decided to have key economic sectors next to urban areas.
22282	140	18			delete symbol + (to be consistent with the rest of the report) [LUIS VALDES, Spain]	Editorial – copyedit to be completed prior to publication
61924	140	18	140	35	Almost no content in this section (1 reference cited), despite aspects related to crops assessed previously, and potential implications of land use in mitigation scenarios. [Valérie Masson-Delmotte, France]	Accepted – section was removed
2446	140	28	140	42	Land area affected is one of the many different potential metrics for assessing interacting and cascading risks. There are many other, such as population affected, economic output affected, etc. In addition, the severity of expected risks in the various regions could be integrated in teh assessment to provide more informed metrics. It is clear that the current knowledge (and available literature) on interacting and cascading risks is very limited (only one reference is included in this section), and this should be clearly stated in the text. [Greece]	Accepted – additional information was added, and limitations of data were stated.
10464	140	28	140	42	One paper about interacting climate impacts in a 1.5 and 2 °C world by Stefan Lange et al. and entitled " The climate change signal in natural disasters. " was submitted to the Chapter 3 scientist before the submission deadline and could be cited here. [Christopher Reyer, Germany]	Accepted – recommended literature added
31082	140	30	140	42	only one ref in this paragraph and unclear where all the information is coming from. Figire 3.22 - where is this figure coming from? And unclear what this figuring is showing [James FORD, Canada]	Accepted – additional information was added to the text, and a revised caption added to the figure.
43238	140	34	140	34	If you want to change this specifically to the difference between 1.5 & 2.0, then the change is ~2 fold see tables in (Supplementary information, Table SS5 / 6, section 4). This applies (on a global level) to both exposed, and "exposed & vulnerable" populations. [Edward Byers, Austria]	Accepted – text revised
41634	140	36			Change "income <$10/day" to "income < 10 USD day-1" [Czech Republic]	Editorial – copyedit to be completed prior to publication
43172	140	36	140	36	suggested clarification: "exposure to climate risks in multiple sectors"…. Is an order of magnitude… [Edward Byers, Austria]	Accepted – text revised
43174	140	36	140	36	SSP3 (~100 million), SSP1 (1.4 billion) [Edward Byers, Austria]	Accepted – clarifications added
43176	140	36	140	36	Clarification: Exposure to multi-sector risks increases from 1.8billion to 3.2 billion between 1.5 and 2.0°C, with 4.4 billion exposed at 3.0°C under SSP2.The exposed and vulnerable (<$10/day) comprise approximately 16%, being 0.3bi at 1.5 and 0.6 bi at 2.0°C.. [Edward Byers, Austria]	Accepted – statement edited for clarity
43182	140	40	140	40	Clarification: "South Asia" (mostly Pakistan, India and China) [Edward Byers, Austria]	Accepted – statement edited for clarity
43240	140	40	140	40	The change in number of "exposed and vulnerable" people to multi-sector climate impacts between 1.5 to 2.0C is highest in African regions: Southern and Western African regions increases by approximately ~5x, and in East Africa is projectedup to a 10x increase (Supplementary information, Table SS5 / 6, section 4). [Edward Byers, Austria]	Accepted – updated information added

Comment No	From Page	From Line	To Page	To Line	Comment	Response
8812	140	41	140	41	butspreading to' should be 'but spreading to' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
35216	140	41	140	41	The spacing is missing between words "butspreading" [Shaukat Ali, Pakistan]	Editorial – copyedit to be completed prior to publication
43178	141	1	141	3	Figure 3.22 should include colorbar - authors can provide edited hi-resolution figure exactly to your specifications. [Edward Byers, Austria]	Accepted – Figure was revised and a colourbar included.
43180	141	1	141	3	Figure 3.22 A third panel showing the masked difference between 1.5/2.0 could be produced by authors [Edward Byers, Austria]	Accepted – Figure was revised and a third panel included as suggested.
50560	141	3	141	3	Figure 3.22: Source and details (such as color legend) are missing. I suppose the figure is taken from the submitted study by Byers et al. [Jacob Schewe, Germany]	Accepted – figure caption was revised and the correct reference provided.
10450	141	11	141	29	the whole box is about one example, so maybe make this clear in the heading which is much more general at the moment [Christopher Reyer, Germany]	Not applicable – This box was removed.
32574	141	11	141	11	How are interacting physical impacts considered in this document? E.g. SLR combined with reduced precipitation (and the subsequent impact on water supply) or SLR with extreme precip (and impact on coastal flooding)? [Rosanne Martyr-Koller, Germany]	Not applicable – This box was removed.
41450	141	11	141	29	Box 3.8 needs a brief introductory remark on what are cascading and interacting impacts. [Lourdes Tibig, Philippines]	Not applicable – This box was removed.
61926	141	11	141	30	There is a major gap between the title of the box and the content (one case study). There is just a description of events from a few publications and no assessment. What is the link between this case study and 1.5°C? [Valérie Masson-Delmotte, France]	Not applicable – This box was removed.
9072	141	23			The sentence "In April and May, a bloom of Alexandria catenella, an organism producing a paralytic neurotoxin, …" should be more precise as "In April and May, a bloom of the dinoflagellate Alexandria catenella, an organism producing a paralytic neurotoxin, ..." because it is important that a scientific report like this should indicate the type of organism we are talking about, as it has been done in other parts of this chapter like in page 93, line 45 or in page 94, line 5, or in page 100, lines 45-46. [Alejandro Cearreta, Spain]	Not applicable – This box was removed.
2448	142	1	165	7	Information on the avoided impacts and reduced risks at 1.5 oC compared to 2 oC is also included in the previous sections; this 'duplication' creates some confusion about the purpose of section 3.5 and its consistency with previous sections. At least, links to section 3.4 should be made in each sub-section of section 3.5 [Greece]	Rejected. Section 3.5, particularly in its revised form, adds extended information on the global Reasons for Concern, regional economic costs at 1.5 vs 2 degrees C of global warming, and regional climate change hot spots and tipping points at 1.5 vs 2 degrees C of global warming.
18482	142	1	147	44	This section tends to repeat what has alredy been said in previous parts of the chapter (e.g. people at risk from sea level rise, temperature increase,…). A substantial effort is needed to streamline the text of Chapter 3. [Andrea TILCHE, Belgium]	Rejected. Section 3.5, particularly in its revised form, adds extended information on the global Reasons for Concern, regional economic costs at 1.5 vs 2 degrees C of global warming, and regional climate change hot spots and tipping points at 1.5 vs 2 degrees C of global warming.
22284	142	1			It seems to me that the previous sections already discussed the avoided impacts in 1.5ºC compared to 2ºC. Therefore, I think that this entire 3.5 subsection is redundant in most of its paragraphs. [LUIS VALDES, Spain]	Rejected. Section 3.5, particularly in its revised form, adds extended information on the global Reasons for Concern, regional economic costs at 1.5 vs 2 degrees C of global warming, and regional climate change hot spots and tipping points at 1.5 vs 2 degrees C of global warming.
28424	142	1	150	26	Figure 3.23. We have strong concerns regarding the envisaged update of the "Reasons for Concern" Graphic as a synthetic output of this chapter. Based on the current status of the analysis here we would urge the author team to reconsider whether an update of the RFC-figure is the best graphical representation of the available evidence. The WGIIAR5 dedicated four years and an entire chapter plus considerable cross-chapter coordination and efforts to produce the RFC version included in the SPM of AR5WGII and subsequently in the SYR. Given the very tight timeline, comparatively small chapter team and limited synthetic research published on the matter, it seems very ambitious to update the assessment of Chapter 19 of AR5WGII in a substantive and well-founded way. Also, the lower bound of the RFC graphic was informed by AR5WGII Chapter 18 on observed impacts, which would have to be updated along with the risk assessment. We would therefore encourage the authors to abandon the idea to include an update of the RFC into the SR1.5 and leave this update to the AR6. Alternatively, the author team may consider to restrict the representation to those risks where meta-level research is actually available that helps inform the assessment in a way that is scientifically robust, straightforward to understand and defendable to governments, or expand the format to other areas, as has been done for Oceans and Species distribution in the SYR. [Germany]	We have proceeded to update the figure based on a substantial amount of literature that has become available since AR5, but with a focus on risks at 1.5 vs 2 degrees of global warming. Moreover, we have discontinued the embers at 3 degrees C given the focus of SR1.5, and in anticipation of AR6.
60606	142	1	150	1	Section 3.5 would have been a useful one to include in the text if there was substantial new material that was not discussed earlier (in sections 3.3 and 3.4). section 3.5.2.4.2 is fairly well written but the ones before and after do not include new material. Some of those sections are exactly taken out of the previous 3.3 section. [United States of America]	Accepted. The entire section 3.5 has ben significantly revised and updated since the SOD. It should be realised though, that the Reasons For Concern is to some extent about global aggregated risks and will (and must) be based on the analysis of Sections 3.3 and 3.4.
60608	142	1	162	21	The entire section 3.5 (Avoided impacts and reduced risks at 1.5°C compared with 2°C) is redundant with the material presented in the over 100 pages of material leading up to this point. The attempted reframing by labeling as "avoided impacts" or "reasons for concern (RFC)" adds little value. Discussions of Arctic and coral reef impacts stand out as especially redundant. Strongly suggest authors focus on the most value-added insights from section 3.5. And delete the rest. [United States of America]	Rejected. Section 3.5, particularly in its revised form, adds extended information on the global Reasons for Concern, regional economic costs at 1.5 vs 2 degrees C of global warming, and regional climate change hot spots and tipping points at 1.5 vs 2 degrees C of global warming.
29358	142	6	142	6	After 'Reasons for Concern' the abbreviation (RFC) is missing. Because in line 34 only RFC is written but the reader does not know what is it [Borbala Galos, Hungary]	See response to comment #33510
13954	142	18	142	18	Distribution of impacts doesn't explain what about the distribution is important: perhaps say physical as well as socioeconomic? [Natalie MAHOWALD, United States of America]	Noted. The original naming for the RFC3 is "distribution of impacts". See Oppenheimer et al. (2014, AR5 Chapter 19)
32576	142	22	142	22	Rephrase "benefits" to "reduction of risk". See Comment 2. [Rosanne Martyr-Koller, Germany]	Rejected. Use of the word "benefits" is appropriate to use in the text, including to, in some instances, when referring to "reduced risks".
22286	142	23		27	Please ensure concordance with the numbering of subheadings. It seems that they should be 3.5 something, instead of 3.6. something. [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
10544	142	29	142	29	"tbales" should be "tables" here. [Hong Yang, Switzerland]	Not applicable - This text was deleted
49232	142	32			No indication is given, whether or not the RFCs will be updated. If the authors would decide to do so, and I would argue that there is very good basis for this i.e. for RFC5 in the light of potentially already triggered WAIS glacier disintegration, this would be a major result of the report. I find it therefore very disappointing that there is no indication given for any of those, whether or not these will be changed for the last expert review. At the same time, the summary given her suffers from similar short-comings as outlined for the individual chapters above. [Bill Hare, Germany]	Accepted. The RFCs have been updated in terms of the latest insights into risk levels as a function of the increase in the global mean temperature.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
53432	142	32	142	32	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication
53550	142	32	142	32	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication
61928	142	32	150	25	At this stage this whole section looks like an empty catalogue, and implies repetition from earlier parts. The structure does not work. [Valérie Masson-Delmotte, France]	The section has been significantly populated since the SOD, based on a substantial amount of new literature that has become available on impacts at 1.5 vs 2 degrees C of global warming.
2452	142	34	142	38	The modification of the RFC figure in AR5 in this Special Report is problematic in my view, as it is not possible to fulfill within the short SR1.5 cycle what will be done in the much longer AR6 cycle with respect to literature review on CC impacts. In addition, the inclusion of this 'updated' graph in SR1.5 creates a potential constraint for the relevant work to be carried out in AR6. What could be done though is to assess the DIFFERENCE between 1.5 oC and 2 oC (which is the topic of this section 3.5) across the five RFC. [Greece]	Rejected. The RFCs have been updated in terms of the latest insights into risk levels as a function of the increase in the global mean temperature, based on an substantial amount of literature that has become available since AR5. Nevertheless the analysis is firmly routed in the AR5 baseline, and the updates are focused on interpreting risks at 1.5 vs 2 degrees C of global warming. In fact, the embers are discontinued at 3 degrees C, due to SR1.5 focussing on risks avoided at 1.5 vs 2 degrees C of global warming.
4196	142	34	142	38	The 'update' of the RFC figure of AR5 in this Special Report is problematic in my view, as it creates a potential constraint for the relevant work to be carried out in AR6 (whose cycle has already started). In addition, since in many cases the literature published after AR5 on the impacts at 1.5 and 2 oC is very limited, it is too ambitious to attempt to 'correct' the graph under the ligh of this still limited literature. During the AR6 cycle, hopefully much more studies on this issue will be published, allowing for a more informed update of the graph. Perhaps it would be better for SR1.5 to illustrate the findings on the transition zone between 1.5 and 3-4 oC by means of a totally different graph. [Greece]	Rejected. The RFCs have been updated in terms of the latest insights into risk levels as a function of the increase in the global mean temperature, based on an substantial amount of literature that has become available since AR5. Nevertheless the analysis is firmly routed in the AR5 baseline, and the updates are focused on interpreting risks at 1.5 vs 2 degrees C of global warming. In fact, the embers are discontinued at 3 degrees C, due to SR1.5 focussing on risks avoided at 1.5 vs 2 degrees C of global warming.
33510	142	34			define RFC here - not been used in this chapter before (except in table of contents). "...accrual of reasons for concern (RFC) with…" [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Term is defined now in ES and section 3.4.13
41636	142	34			Add explanation of "RFC" [Czech Republic]	See response to comment #33510
12134	142	38	142	42	Relevance? [United Kingdom (of Great Britain and Northern Ireland)]	Section 3.5.2 discusses benefits and avoided risks at 1.5 vs 2 degrees C of global warming for each of the Reasons of Concern (RFCs) and is highly relevant to SR1.5 and Chapter 3.
10018	142	39	142	42	Better assessment is required for clarifying number of claims in the report. In regard to the reference base line (year 1986-2005) vs preindustrial time line are different for the timeframes. [Saudi Arabia]	Much of the impacts literature refers to future risks in terms of a present-day baseline rather than the pre-industrial baseline, and are reported as such in SR1.5. However, when summarising aggregated risks, such as in the burning ember diagram, the interpretation for all sectors is given consistently in terms of the pre-industrial base-line.
29360	143		143		Based on Chapter 1 the period 1986-2005 is 0.64 °C warmer than the pre-industrial period 1950-1900 (page 1-14 line 43). This value should be consistent with Figure 3.23. [Borbala Galos, Hungary]	Accepted.
12136	143	1	143	1	I know this figure appears elsewhere, but it is really difficult to understand what it's showing, can it be improved? [United Kingdom (of Great Britain and Northern Ireland)]	The Figure has been revised with a more extensive explanation of the conventions it I based on.
35218	143	2	143	2	The caption can be briefly written as: Figure showing the dependence of risk associated with the Reasons for Concern (RFCs) on the level of climate change,highlighting the nature of this dependence between 0 and 2ºC warming above pre-industrial levels. The color scheme indicates the additional risks due to climate change. The shading of each ember provides a qualitative indication of the increase in risk with temperature for each individual 'reason'. [Shaukat Ali, Pakistan]	Thanks. Text was revised
22288	143	15			remove duplication of "how" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
35220	144	1	144	1	Following studies should be cited under the section : Climate change is posing serious threats and challenges for coral reefs. Most of warm water coral reefs are likely to be eliminated by 2040-2050 under lower greenhouse gas emission scenarios like RCP 4.5. References:Ove Hoegh-Guldberg, Elvira S. Poloczanska, William Skirving and Sophie Dove (2017), Coral Reef Ecosystems under Climate Change and Ocean Acidification, Frontiers in Marine Science. [Shaukat Ali, Pakistan]	Rejected. The mentioned reference is used in Section 3.4, however, but these specific details need not to be mentioned in the discussion of the RFC.
31084	144	2	144	9	It was also observed that many species and systems have limited ability to adapt to the very large risksassociated with warming of 2.6ºC or more, particularly Arctic sea ice - what is meant here by "systems"? Does it include human systems - if it does it needs clarifying because there is very little Arctic literautre looking at how human systems might adapt to warming of 2.6C or more. [James FORD, Canada]	The section refers to ecosystems, and this is very clear in the revised text.
8814	144	3	144	3	currenttemperatures, with' should be 'current temperatures, with' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22290	144	3			insert space between "currenttemperatures" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
33512	144	3	144	5	two spaces missing "current temperatures" and "risks associated" [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised with the suggested edit
35222	144	3	144	3	The spacing is missing between words "currenttemperature" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
16402	144	4	144	6	No mention of Southern Ocean or other non-Arctic sea ice, please amend. [Australia]	Arctic sea-ice is dealt with separately, in the sections on regional tipping points and hot spots (3.5.4 and 3.5.5) - but it is not classified as a "Reason for Concern" - unlike ice-sheet instabilities, which are dealt with in Section 3.5.2.5 - including for the Antarctic.
8816	144	5	144	5	large risksassociated with' should be 'large risks associated with' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22292	144	5			insert space between "riskassociated" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
8818	144	7	144	7	present dayglobal temperatures' should be' present day global temperatures' [Robert Shapiro, United States of America]	Editorial – copyedit to be completed prior to publication
6360	144	13	144	24	This is a key difference which should be highlighted very clearly in the chapter summary and SPM [Anne Olhoff, Denmark]	Accepted - these findings are indeed also prominently reported on in the SPM.
6362	144	13	145	27	These subsections need thorough review once completed. [Anne Olhoff, Denmark]	The Reasons for Concern subsections were extensively revised and further developed since the SOD.
18484	144	13	144	24	This is a key difference which should be highlighted very clearly in the chapter summary and SPM [Andrea TILCHE, Belgium]	Accepted - these findings are indeed also prominently reported on in the SPM.
18486	144	13	145	27	These subsections need thorough review once completed. [Andrea TILCHE, Belgium]	The Reasons for Concern subsections were extensively revised and further developed since the SOD.
22294	144	15		24	I found this paragraph redundant. Its content is repeated in section 3.4.4 and Box 3.6 (as indicated in line 15) [LUIS VALDES, Spain]	Accepted. The text has been substantially revised.
8820	144	17	144	17	still be see a' should be 'still show a' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
8822	144	21	144	21	adapt or reassort geographicallyshould be 'adapt or reassert geographically' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32578	144	23	144	23	Change "red to purple" to "purple to red" [Rosanne Martyr-Koller, Germany]	Thanks. The section is related to Fig 3.23 in SOD. "the transition from red to purple" follows the wording in the caption.
9394	144	30	144	42	What about greening of the tundra (shrubification) - this would be a significant change in Arctic ecosystems. Perhaps this will be discussed further once additional literature is reviewed as indicated in placeholder statement [Sharon Smith, Canada]	Shrubification of the tundra is discussed in Section 3.5.4 (regional hot spots), rather than under "Reasons For Concern".
34116	144	30	144	42	3.5.2.1.2 Arctic ecosystems: This subsection does not say anything about ecosystems in its current state, it only deals with zero ice vs not zero ice scenarios. We assume the "placeholder" will have some content covering ecosystems. However, please note our view that Arctic ecosystems have not received much attention in the current version of the report. Given the changes observed in the Arctic, this seems like a large gap for this report so far. [Norway]	Indeed, this section points to the loss in Arctic sea-ice as a risk to the unique ecosystem, but the specific ecosystem vulnerabilities are discussed in Section 3.3.9 and are not repeated here.
42796	144	31	144	42	Screen and Williamson 2017 found that the Arctic has a 1 in 3 chance of becoming ice-free if temperatures reach 2ºC. [Kristin Campbell, United States of America]	Many thanks for pointing this out - this study is being referred to in Section 3.3.8.
43036	144	31	144	42	Screen and Williamson 2017 found that the Arctic has a 1 in 3 chance of becoming ice-free if temperatures reach 2ºC. [Durwood Zaelke, United States of America]	Many thanks for pointing this out - this study is being referred to in Section 3.3.8.
306	144	37	144	38	Meant to read.....at 1.50 C vs. 20 C, which..... [Paul Doyle, Canada]	Accepted - Text was revised with the suggested edit
3670	144	37			Revert '2' and '1.5'. Risks are reduced at 1.5°C vs. 2°C. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
8824	144	37	144	37	at 2ºC vs. 1.5ºC,' should be 'at 2ºC vs. 1.5ºC,' isnt this backwards: should be 1.5 vs. 2.0 [Robert Shapiro, United States of America]	Rejected. It is sometimes more useful to compare risks under 2 degrees C of warming to those at 1.5 degrees C of global warming (the aspirational threshold not to exceed under the Paris Agreement).
32580	144	37	144	38	This reads as if 2C would reduce permafrost thawing. Please rephrase. [Rosanne Martyr-Koller, Germany]	Accepted - Text was revised.
34118	144	37	144	38	Reduced thawing of permafrost would be expected to occur at 2ºC vs. 1.5ºC. Please consider if this is formulated as the opposite of what is meant. [Norway]	Thank you for pointing this out - correction made.
52626	144	37	144	38	This seems to be the worng way around. Reduced thawing at 1.5oC compared with 2oC. Again, suggest avoiding the use of 'reduced' in the 1.5oC scenario given it is still considered an increase relative to current/pre-industrial levels. [Charlotte Roehm, United States of America]	Thank you for pointing this out - correction made.
56010	144	37	144	42	Add carbon budget figures here per previous comments, for example, "…Arctic as well as less carbon release over time, decreasing the pressure on carbon budgets." Anticipate greater detail in Arctic in general per "placeholder" statement lines 40-42. [Pamela Pearson, United States of America]	This specific section deals with threatened ecosystems, not with carbon budgets, which is discussed extensively in Chapter 2 of the report.
650	144	45	145	6	Another disappointment here… peatlands are not even mentioned here. [Maria Jesus Iglesias Briones, Spain]	Peatlands and the vulnerability of the peatlands carbon sink to Global Warming and regional climate change are discussed in detail in sections 3.4.3.4, 3.4.3.5.4 and 3.4.4.12. Unfortunately, no literature was available at the time of finalising SR1.5 on the sensitivity of the peatland carbon sink to 1.5 vs 2 degrees C of Global warming, and thus do not feature prominently in section 3.5 (which focused on avoided impacts and reduced risks at 1.5 vs 2 degrees C of Global Warming).
41638	145	1			Change "N America" by "North America" or "N. America" to be consistent in whole Report [Czech Republic]	Editorial - copyedit to be completed prior to publication
8826	145	2	145	2	would not doso' should be 'would not do so' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22296	145	2			insert space between "doso" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
55922	145	2	145	2	Space between do and so [Debora Ley, Guatemala]	Accepted - Text was revised with the suggested edit
18488	145	9	145	17	Broaden section title and content to cover risks for low lying islands, coasts and communities [Andrea TILCHE, Belgium]	Unique and threatened systems in small island states and in systems fed by glacier meltwater were also considered in AR5 in making a contribution to this RFC, but there is little new information about these systems that pertains to 1.5ºor 2ºC global warming, as we point out in the final version of the section.
22298	145	9		27	Not going to the point of title 3.5 "Avoided impacts and reduced risks at 1.5°C compared with 2°C" [LUIS VALDES, Spain]	The section has been extensively revised since the SOD and in the final version clearly addresses avoided impacts at 1.5 vs 2 degrees C of global warming.
9622	145	20	145	27	Great start on this section, but the associated risks to socioecological systems are not limited to "the Andes and Asia." In fact, the most thoroughly studied region in this regard is northwestern North America, including Alaska, USA and British Columbia, Canada. See (and cite) the recent review article by O'Neel et al. (2015, Bioscience, 65: 499-512). [Sean Fleming, United States of America]	We have refrained in the revised text from focussing under the Reasons For Concern discussion on specific socioecological systems.
2450	145	32	145	33	Where current evidence is available' or 'Where sufficient evidence is available for this purpose'? It may be the case that at present there is some evidence, but it is limited. [Greece]	The section has been revised to translate the evidence available into IPCC uncertainty language and related confidence statements.
8828	145	43	145	43	since AR5provides' should be 'since AR5 provides' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22300	145	43			insert space between "AR5provides" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
17182	145	46	145	47	Several studies have analyzed the meteorological conditions favoring hail precipitations in Europe and North America. There is a consensus among the authors that have found. on one hand, the global warming leads us to an evolution toward synoptic environment, favoring the severe convection and hail precipitation (Sanchez et al., 2017, Pucik et al., 2017) on the other hand, the increase of temperature results of an increase in the melting level height (Dessens et al., 2015). [JOSE LUIS SANCHEZ, Spain]	Many thanks for the comment, but in this section we focus on distinguishing in the occurrence of heavy falls of rain at specifically 1.5 vs 2 degrees C of global warming, rather than on changes in extreme precipitation events in general.
17608	145	46	145	47	Several studies have analyzed the meteorological conditions favoring hail precipitations in Europe and North America. There is a consensus among the authors that have found. on one hand, the global warming leads us to an evolution toward synoptic environment, favoring the severe convection and hail precipitation (Sanchez et al., 2017, Pucik et al., 2017) on the other hand, the increase of temperature results of an increase in the melting level height (Dessens et al., 2015).Brimelow et al., 2017 North America has shown a dramatic decrease in hail frequency in low altitude areas due to a significant increase in melting level. Conversely, in some regions with higher height in Southern Europe, we have found an increase of intensity and severe hail precipitations with statistically significant results (Hermida et al., 2015, Sánchez et al., 2017) [JOSE LUIS SANCHEZ, Spain]	Many thanks for the comment, but in this section we focus on distinguishing in the occurrence of heavy falls of rain at specifically 1.5 vs 2 degrees C of global warming, rather than on changes in extreme precipitation events in general.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
17610	145	46	145	47	The expected scenario is that an increase of 1,5ºC or 2ºC, at least in medium altitudes, provokes the small hail precipitations decrease for the merger effects and increase the strong hail precipitations as an effect of the increase of convection. In mountain or high altitude areas as the Pyrenees in South Europe or the Rocky Mountains in North America and in general in areas where the increase of the merger is not enough, the global warming will lead to an increase and larger of the hail precipitations which is expected to increase the damage increased. [JOSE LUIS SANCHEZ, Spain]	Many thanks for the comment, but in this section we focus on distinguishing in the occurrence of heavy falls of rain at specifically 1.5 vs 2 degrees C of global warming for land regions in general, rather than on changes in hail events at specific locations.
17612	145	46	145	47	References [JOSE LUIS SANCHEZ, Spain]	New paragraph refer to section 3.3
17614	145	46	145	47	Brimelow J. C., Brrows W. R., Hanesiak, J. M. 2017. The changing hail threat over North America in response to anthropogenic climate change. Nature Climate Change, 7, 516-524. [JOSE LUIS SANCHEZ, Spain]	Many thanks for the comment, but in this section we focus on distinguishing in the occurrence of heavy falls of rain at specifically 1.5 vs 2 degrees C of global warming for land regions in general.
17616	145	46	145	47	Dessens, J., Berthet, C., Sanchez, J.L., 2015. Change in hailstone size distributions with an increase in the melting level height. Atmos. Res. 158–159, 245–253. Hermida, L., López, L., Merino, A., Berthet, C., García-Ortega, E., Sánchez, J.L., Dessens, J., 2015. Hailfall in southwest France: relationship with precipitation, trends and wavelet analysis. Atmos. Res. 156, 174–188. [JOSE LUIS SANCHEZ, Spain]	Many thanks for the comment, but in this section we focus on distinguishing in the occurrence of heavy falls of rain at specifically 1.5 vs 2 degrees C of global warming for land regions in general.
17618	145	46	145	47	Púˇik, T., Groenemeijer, P., Rädler, A.T., Tijssen, L., Nikulin, G., Prein, A., Meijgaard, E., Fealy, R.h Jacob, D., Teichmann, C. 2017. Future changes in European severe convection environments in a regional climate model ensemble. Journal of Climate, 30, 17, 6771-6794. Sanchez J. L., Merino A., Melcon P., García-Ortega E., Fernández González S., Berthet C., Dessens J. 2017. Are meteorological conditions favoring hail precipitation change in Southern Europe. Analysis of the period 1948-2015. Atmos. Res., 198, 1-10. [JOSE LUIS SANCHEZ, Spain]	Many thanks for the comment, but in this section we focus on distinguishing in the occurrence of heavy falls of rain at specifically 1.5 vs 2 degrees C of global warming for land regions in general.
35224	145	48	145	48	Following study is to be cited under the section: As a result of increase in per °C of global warming increases in heatwave days between 4–34 extra days per season are projected. Reference:S. E. Perkins-Kirkpatrick & P. B. Gibson(2017), Changes in regional heatwave characteristics as a function of increasing global temperature, Scientific Reports, 7. [Shaukat Ali, Pakistan]	Thank you for the reference, however we limited the discussion in the text to specifically impacts at 1.5 vs 2 degrees C of global warming.
46800	145	49	145	49	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has ben carefully revised in rephrased in terms of the usage of IPCC uncertainty language.
47274	146		146		Astrom et al (2013) Cited three times with completely identical statements on Page 121, Page 146 and Page 156 [Sarah Connors, France]	The text has been revised to avoid this repetition.
5386	146	2	146	6	This difference probability is more than 2 ºC in some regions, such as West Asia, Middle East and North Africa. [Leili Khazanedari, Iran]	The values stated need to be representative of land regions in general and consistent with the quantitative analysis in Section 3.3.
46802	146	3	146	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has ben carefully revised in rephrased in terms of the usage of IPCC uncertainty language.
3740	146	5			and fluviomarine ecosystem services. [Castor Muñoz Sobrino, Spain]	Rejected, in the absence of literature specific to impacts at 1.5 vs 2 degrees C of warming.
2454	146	6	146	9	Does this sentence mean that in terms of impacts of extreme temperature to crop yields, human health and the sustainability of ecosystems, a conclusion on avoided impacts under 1.5 oC compared to 2 oC cannot be concluded? If so, it should be clearly stated here. [Greece]	No. It merely states, and does so clearly, that benefits from restricting global warming to 1.5 degrees C depend on whether certain thresholds of extremes being exceeded at this level of warming or not, with these thresholds being wide-ranging depending on the specific crop or ecosystem under consideration.
22302	146	6			replace] by) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
5388	146	11	146	11	I think "Human mortality from cold extremes" is important, too! [Leili Khazanedari, Iran]	That certainly is important, but the section focuses on the exceedance of hot extremes under 1.5 vs 2 degrees C of warming.
24182	146	11	146	11	Section 3.4. 7 ---> "Section 3.4.7" [Mustafa Tufan Turp, Turkey]	Not applicable - This section was rewritten
5390	146	13	146	16	There is a clear relationship between high temperature and premature mortality in the MENA (J. Lelieveld, Y. Proestos, P. Hadjinicolaou, M. Tanarhte, E. Tyrlis, G. Zittis, 2016, Strongly increasing heat extremes in the Middle East and North Africa (MENA) in the 21st century, Journal of Climate Change, 137:245-260 DOI 10.1007/s10584-016-1665-6), so it is important to attend it. [Leili Khazanedari, Iran]	Thank you for the reference - but in this discussion we focus specifically on impacts at 1.5 vs 2 degrees C of global warming.
18490	146	13	146	16	Example and text same as in p. 121 - lines 48-50, as well as p. 156, 45-47. This is not the only repeted case/text. [Andrea TILCHE, Belgium]	Thanks. Text was revised.
2456	146	19	146	28	This sub-section presents the difference between 1.5 oC and 2 oC in terms of heavy precipitation, but not in terms of what the effects of this heavy precipitation are for natural and human systems. [Greece]	Correct - this section deals with extreme events specifically from a physical science perspective, with impacts on human and natural systems described extensively in section 3.4.
16404	146	19	146	28	It is not clear why this section focuses on "heavy precipitation" only. In some cases, changes in the mean will be important. In other cases, changes in interannual or intraseasonal variability. In other cases, changes in extremes and associated flooding. These should all be included. [Australia]	This section discussed specifically changes in extreme events as a global aggregated risks, so changes in the mean are not relevant o this section - these are dealt with extensively elsewhere, for example in section 3.3.
36438	146	25	146	26	The statement is biased and seems to be apprehensively formulated. [Snaliah Mahal, Saint Lucia]	Wording of the section has been revised.
6364	146	31	146	38	Again a finding worth highlighting very clearly in the messaging. [Anne Olhoff, Denmark]	Accepted - this finding features prominently in the Executive Summary.
18492	146	31	146	38	Again a finding worth highlighting very clearly in the messaging. [Andrea TILCHE, Belgium]	Accepted - this finding features prominently in the Executive Summary.
9620	146	31	146	38	This very short section on drought seems confusing and could contribute a little more. For example, the first sentence opens with "When considering the difference between precipitation minus evaporation as a function of global temperature changes", but this is a limiting view of drought and its sources: P-E is a mediocre drought indicator, and more importantly, drought (even if indexed by P-E) is obviously as affected by climate change-induced changes in P as it is by "global temperature changes". Perhaps "global temperature changes" was intended to mean "global anthropogenic climate change leading to a 1.5°C temperature increase" or something roughly like that, but as it stands, the overall section needs some more work. [Sean Fleming, United States of America]	Rejected. P-E is a very important indicator of water availability. It should be noted that this section discussed global aggregated risks, and that section 3.3 discussed drought under 1.5 vs 2 degrees C of global warming in more detail.
60610	146	31	146	38	Statement is not necessarily true. Depending on the scenario used to create the 1.5 vs 2°C change, a scenario of increased need for biofuels could imply more water stress in many regions. Refer to Hejazi et al. (2015). [United States of America]	Rejected. This statement specifically refers to the occurrence of drought as a consequence of reduced precipitation.
5392	146	37	146	38	I suggest to add "West Asia and Middle East" at the end of sentence. [Leili Khazanedari, Iran]	Rejected - not substantiated by the literature available for impacts at 1.5 vs 2 degrees C.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9346	146	41			The text of section "3.5.2.2.4 Fire" is basically the same of lines lines 17-28 at page 81. You may consider avoiding this kind of repetition. Regarding the content, I suggest to clearly indicate that very few studies have explored the impact of climate change on fire on a global scale and (to date) no one considering the periods of 1.5°C vs. 2°C of global warming. In addition, the predictability of fires is a complex issue due to the limitations in observational fire data and to the concurrence of a variety of factors affecting fire activity. Under changing climate conditions, several possible pathways of wildfire response can be identified –depending on the magnitude of climate change as well as on differences in how fires, vegetation and humans respond to such changes. Somehow I feel that these uncertainties are not sufficiently assessed and acknowledged, which results in perhaps overly confident statements. It would be fine to give the reader some comments on these uncertainties and additional references should be added, as for instance: Hessl, Amy E. 2011. Pathways for climate change effects on fire: Models, data, and uncertainties. Progress in Physical Geography, 35(3), 393–407. Jolly, W. M. et al. Climate-induced variations in global wildfire danger from 1979 to 2013. Nature Communications 6 (2015). Batllori, E., Parisien, M.-A., Krawchuk, M. A. & Moritz, M. A. Climate change-induced shifts in fire for Mediterranean ecosystems. Global Ecology and Biogeography 22, 1118–1129 (2013). Turco, M. et al. On the key role of droughts in the dynamics of summer fires in Mediterranean Europe. Scientific reports 7 (2017). Andela, N. et al. A human-driven decline in global burned area. Science 356, 1356–1362 (2017) Pechony, Olga, & Shindell, Drew T. 2010. Driving forces of global wildfires over the past millennium and the forthcoming century. Proceedings of the National Academy of Sciences, 107(45), 19167-19170. [Marco Turco, Spain]	Please see section 3.4.3, for a more in depth discussion of the available literature on fire risks at 1.5 vs 2 degrees C of global warming. The RFC related discussion needs to be concise and focussed on global aggregated risks.
41640	146	43			Change "N America" by "North America" or "N. America" to be consistent in whole Report [Czech Republic]	See response to comment #41638
35226	147	11	147	11	Following literature should be cited in the section: The hydrological impacts of climate change in a 1.5, 2 and 3 °C degree warmer world are more intense and spatially more extensive. Reference:Chantal Donnelly, Wouter Greuell, Jafet Andersson, Dieter Gerten, Giovanna Pisacane, Philippe Roudier, Fulco Ludwig(2017), Impacts of climate change on European hydrology at 1.5, 2 and 3 degrees mean global warming above preindustrial level, Climatic Change, 143, pp. 13–26. [Shaukat Ali, Pakistan]	Many thanks, we have included this reference.
4198	147	22	147	22	What is the 'renewable surface water resource'? [Greece]	Not applicable - This section was rewritten
8830	147	24	147	24	for less less' should be 'for less' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
4200	147	28	147	38	What about the sea-level rise under 1.5 oC? Only the 2 oC are mentioned here. [Greece]	Many thanks for the comment. However, the purpose of this sentence is to point out that there may regional differences in terms of sea-level impacts, rather than to point out differences between these impacts at 1.5 vs 2 degreesC of warming. The latter comparison is drawn in some detail in section 3.3.9.
60612	147	28	147	38	This section on SLR seems redundant with previous material. This is an example where repeating material, but placing it under a different heading like RFC, doesn't necessarily provide more value to the reader. [United States of America]	Many thanks for the comment. The section has been revised, and now refers to sea-level rise only for the purpose of pointing out that impacts may differ regionally. The more extensive discussion of sea-level rise impacts is provided in section 3.3.9.
12138	147	29	147	30	What does SLR have to do with the number of people living in coastal megacities? [United Kingdom (of Great Britain and Northern Ireland)]	Accepted. The sentences this comment refers to has been removed from the text.
33514	147	31	147	32	repeat of reference Jevrejeva et al [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
58096	147	31	147	32	There is a repetition of the reference "Jevrejeva et al. (2016)" so that the second may be deleted. [Siir KILKIS, Turkey]	Not applicable - This section was rewritten
58098	147	31	147	32	The sentence "Subsidence of coastal areas as erosion increases will enhance those exposed" is not clear. The reference Jevrejeva et al. (2016) indicates that "The coastal communities of rapidly expanding cities in the developing world, and vulnerable tropical coastal ecosystems, will have a very limited time after midcentury to adapt to sea level rises unprecedented since the dawn of the Bronze Age." [Siir KILKIS, Turkey]	Not applicable - This section was rewritten
22304	147	36			insert space between "2017b)and" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
33516	147	36			here and some other places in this chapter missing space after bracket. "…2017b)and…" [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
22306	147	48			insert space between "2014)explain" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
22308	147	51			Full stop missed [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
17838	148		149		The explanation is not thematically organized. The explanation can be better reorganized by ecosystem fields such as plant. animal. Insect, or tessrestrial, aquatic, ocean, etc.. And ecosystem function or service tin the title is not explained in the text. It should be added./Song, C., Lee, W.K., Choi, H.A., Kim, J., Jeon, S.W., Kim, J.S. 2016. Spatial assessment of ecosystem functions and services for air purification of forest in South Korea. Environmental Science & Policy 63:27-34. [Republic of Korea]	Rejected. The title of the section is "Biome shifts, risks of species extinction and ecosystem functioning and services", which suitably describes the content of the section. Moreover, each of these aspects is systematically addressed within the section. The discussion has been updated and streamlined in the final version of the Chapter, however.
6366	148	1	148	31	the aggregate economic impacts and the uncertainty and likely underestimation of these could be presented more clearly. [Anne Olhoff, Denmark]	Accepted. We have significantly revised and extended the discussion, pointing out uncertainties and indicating where assumptions indeed imply that costs may be underestimated.
18494	148	1	148	31	the aggregate economic impacts and the uncertainty and likely underestimation of these could be presented more clearly. [Andrea TILCHE, Belgium]	Accepted. We have significantly revised and extended the discussion, pointing out uncertainties and indicating where assumptions indeed imply that costs may be underestimated.
32826	148	1	148	31	This section on economic impacts would benefit from greater attention being paid to co-benefits as these can be large but are often neglected in the social cost of carbon estimates discussed here. A specific example are the co-benefits that occur via public health due to reduced impacts of air pollution under 1.5C vs 2C. We recently estimated these at 0.5-0.6% of world GDP by mid-century (2060) in Shindell et al., Nature Climate Change, 2018 (market costs only, following OECD methods, with non-market valuation much larger. To put this into context note that this value is as large as the total benefit (reduced risk) reported for the US for 1.5C vs 2C in the second paragraph of this section, suggesting that benefits would be even larger elsewhere (where air pollution is worse, as in those areas the co-benefit would of course be complemented by climate benefits as well). [Drew SHINDELL, United States of America]	Thank you for pointing out this important publication - its findings are discussed in the final version of the Chapter and also in this section (RFC4).

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32830	148	1	148	31	It would be useful to have at least some discussion of how the avoided damages/risk reduction compare with the mitigation costs (the latter are presented in chapter 2), even if it's just to say that this kind of comparison if very difficult (market vs non-market impacts, different parties paying costs vs receiving benefits, etc.). Otherwise readers will wonder why this is missing and may also try to make such comparisons themselves without realizing the challenges. [Drew SHINDELL, United States of America]	Rejected. This section deals with specifically global aggregated impacts, including economic impacts. Combining this discussion with mitigation costs would imply a complex discussion out of the scope of the section. It is best for the complex issue of mitigation costs to be dealt with in detail in Chapter 2. At least qualitative comparisons are possible between RFC4 and Chapter 2, in the sense that global aggregated costs from damages can be compared to global aggregated mitigation costs.
60614	148	1	148	7	This section on Global Economic Impacts should be its own section rather than being a small part of RFC. Suggest moving to 3.5.3. [United States of America]	Rejected. Global economic impacts is by definition a key component of RFC4 (global aggregated impacts).
32822	148	2	148	7	The second sentence in this paragraph repeats nearly everything stated in the first so theset should be merged [Drew SHINDELL, United States of America]	The section has been largely rewritten.
588	148	9	148	14	There are no cites in this paragraph. [Robert Koppu, United States of America]	Thanks. Text was revised with the suggested edit
10020	148	9	148	14	Extensive studies required specific to 1.5C scenario and also including other regions. The information was generated only for USA region. [Saudi Arabia]	Since the SOD, a number of additional papers on economic impacts under 1.5 vs 2 degrees C of warming were published, and these are now being referred to in the text.
18496	148	9	148	14	While the recent literature on the US is interesting, it cannot be used to infer more broad results, even with the disclaimer. [Andrea TILCHE, Belgium]	Since the SOD, a number of additional papers on economic impacts under 1.5 vs 2 degrees C of warming were published, and these are now being referred to in the text. The overall body of evidence have prompted us to maintain the statement that the global aggregates of economic impacts become negative is below 2ºC , and that there is a possibility that this is below 1.5ºC warming. To the former of these points, we have allocated a "medium" level of confidence.
32824	148	9	148	14	The study being discussed here should be referenced (presumably this is the Hsiang et al Science 2017 paper). The units also need to be given (presumably this is percent of US GDP?). [Drew SHINDELL, United States of America]	Many thanks for the comment - accepted. In fact, since the SOD we have significantly expanded the section on global aggregated economic impacts. Several references are listed in the revised discussion, and the units in which changes are projected are listed for each of the different studies that have been assessed. Some of these studies (such as Hsiang et al., 2017) have measured economic damages and costs using GDP as unit, whilst others used the Gross World Product (GWP).
4202	148	13	148	13	Perhaps it is better to say '..the point at which economic benefits from avoided risks outweigh economic impacts at global level could be lower than in AR5…' (because, still at this point, there will be economic impacts of climate change despite adaptation efforts). [Greece]	We have rewritten the section, and it is clear from the text that risks avoided by restricting the temperature increase to 1.5 degrees C are more substantial than for 2 degrees C, whilst projected damages are lower.
22310	148	16			insert space between "2014)note" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
32828	148	16	148	31	The material here concentrates on social costs of carbon. There are other issues associated with this that are not mentioned here (e.g. costs for non-CO2 emissions that include air quality, equity weighting, etc.) but are discussed in Box 2.1 (in chapter 2). It'd be helpful to the reader to cross-reference that box and discussion here. [Drew SHINDELL, United States of America]	Rejected. This section focuses specifically on global aggregated risks, and the content of Box 2.1 is not of direct relevance.
35228	148	16	148	17	The spacing is missing between words "2014)note and indicateda" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
8832	148	17	148	17	have indicateda potential' should be 'have indicated a potential' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22312	148	17			insert space between "indicateda" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
3734	148	19			aggregate [Castor Muñoz Sobrino, Spain]	Accepted - Text was revised with the suggested edit
22314	148	19			correct agregate [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
590	148	20	148	29	The social cost of carbon is discussed here without being defined or introduce -- this will be unintelligible to those who are not familiar with the concept and its challenges. [Robert Koppu, United States of America]	Accepted. We have moved this discussion to box 3.6, with a clear reference to the definition of the "social costs of carbon" in Chapter 2.
3736	148	21			. [Castor Muñoz Sobrino, Spain]	Not applicable - This section was rewritten
10022	148	25	148	31	What the level of uncertainty on Cai et al., 2016 result that social cost of carbon increasing from $15/ton to $116/ton comparing 1.5c to 3c. How then this result led to the conclusion that global warming needed to be constrained to 1.5c above pre-industrial levels? How welfare is calculated to know that it is minimized? It is understandable that social cost of carbon reflects only one part of welfare (the benefit from mitigation) -- what about the other part represented by the cost of mitigation to get to 1.5c. [Saudi Arabia]	We have extended this discussion (which has also been moved to Box 3.6). The uncertainty levels associated with the costs of carbon are now clearly stated. Moreover, a number of references are used providing evidence that the welfare benefits that are being referred to are taking into account both the costs of mitigation, and the benefits (through avoided impacts) of high mitigation that succeeds in the 1.5 C threshold being avoided.
47298	148	25	148	25	Cai 2016 is not listed in the references but there are Cai 2016a and 2016b [Sarah Connors, France]	Thanks. Literature list is revised.
592	148	26	148	29	Weird to discuss the social cost of carbon as point estimates, with no uncertainty (given how large the uncertainty is) [Robert Koppu, United States of America]	Uncertainty levels have been added, and an extended discussion is now provided in Box 3.6.
4204	148	28	148	29	There are intermediate points between 3 oC and 1.5 oC, and thus high impacts at 3 oC do not lead automatically to the conclusion that global warming would need to be constrained to 1.5ºC above pre-industrial levels. The impacts at 2 oC need to be briefly discussed here so that this conclusion holds. [Greece]	Accepted. The discussion has been updated and now focuses largely on impacts at 1.5 vs 2 degrees C.
41642	148	28			Change "$15/tCO2 to $116/tCO2" to "15 USD tCO2-1 to 116 USD tCO2-1" [Czech Republic]	Not applicable - This section was rewritten
18498	148	29	148	31	How is this translated to a 1.5 and 2 degrees scenarios? Non-linearities may mean that we cannot conclude that 2 degrees would show similar patterns as 3 degrees, compared to 1.5? [Andrea TILCHE, Belgium]	Accepted. The discussion has been updated and now focuses largely on impacts at 1.5 vs 2 degrees C.
8834	148	34	148	34	riks of species' should be 'risk of species' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
12140	148	34	149	17	Lots of this is covered in previous sections - limit discussion to 2 vs 1.5 degrees only, this will also help to shortern the report [United Kingdom (of Great Britain and Northern Ireland)]	The section has been revised and indeed now largely focuses on impacts at 1.5 vs 2 degrees C of warming.
33518	148	34			typo "riks" --> "risk" [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Text was revised with the suggested edit
34120	148	34	149	2	Please consider content from Huang et al 2017 NCC on velocity of temperature change vs velocity of productivity change; a tipping point for some parts of an ecosystem may occur while for another component of the ecosystem they might be a longer time-lag in response to temperature increase. [Norway]	Many thanks, we have included this reference in the section on tipping points and additionally also in section 3.4.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
60616	148	36	148	37	This paragraph is unclear. What does it mean to have 25% more biome shifts at 2 vs. 1.5°C? It matters which biomes, and is it areal changes, averaged across biome classes? If the 25% extracted from Figure 3 of Warszawski et al. (2013), they use the term "fraction of natural vegetation threatened by severe change" as the metric, much more clear than 'biome shifts'. [United States of America]	These percentages refers to the area of the earth's land area that is projected to undergo biome shifts under a specific level of global warming - this is stated very clearly in the revised text.
33520	148	38			for clarity suggest adding text to read "…for warming of 3°C compared to 1.5°C." - which I assume is what the comparison which is being made [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
22316	148	39			insert space between "2014)reports" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
8836	148	40	148	40	temperatures exceeding' should be 'temperatures exceeding' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
33522	148	40	148	45	define extirpation as local extinction the first time it is used (line 40 rather than line 45) [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
8838	148	45	148	45	accrued ince AR5' should be 'accrued since AR5' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
22318	148	45			replace "ince" by "since" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
33524	148	45			type "ince" --> "since" [Stephen Cornelius, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
45628	148	45			Correct 'since' instead 'ince' [Adela M Sánchez-Moreiras, Spain]	Not applicable - This section was rewritten
3738	149	1	149	1	Regional lost of habitats /ecosystems also may be expected [Castor Muñoz Sobrino, Spain]	Agreed - and we do refer to losses in the range of species, but is should be noted that this section deals in particular with "global aggregated impacts", rather than with regional impacts.
45630	149	1			Delete the parentheses in '(compared to those at 2 ºC warming)' [Adela M Sánchez-Moreiras, Spain]	Not applicable - This section was rewritten
45632	149	2			Include the year in the citation (Smith et al.) [Adela M Sánchez-Moreiras, Spain]	Not applicable - This section was rewritten
22320	149	4			insert space between "2014)assessed" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22322	149	25			The cryosphere: West-Antarctic ice sheet, Greenland ice sheet --> rephrase as in 3.5.2.5.1. = Greenland and West-Antarctic ice sheets [LUIS VALDES, Spain]	Thank you for this comment, we have consistently with section 3.3. changed the title of this section to "Greenland and West-Antarctic ice sheets and Marine Ice Sheet Instability".
16406	149	27	149	27	There is little evidence for risk of a major tipping point associated with ENSO. [Australia]	The final version of the Chapter refers to new literature indicating the possibility of a doubling in the occurrence of extreme El Nino events under 1.5 degrees C of global warming.
22324	149	27			The El Niño Southern Oscillation (ENSO) as a global mode of climate variability --> this is not developed below. Consider deletion from this list of bullet points [LUIS VALDES, Spain]	The section has been further developed in the final version of the Chapter.
60618	149	38	149	49	This material on Greenland and West Antarctic ice sheets is covered previously. Consolidate with appropriate previous section or delete. [United States of America]	Rejected. Ice sheet instability should be discussed here, although in a more concise form as in section 3.3 (as is the case), as part of the fifth RFC.
3832	149	40			not only albedo, also temperature; add Greenland before ice sheet for clarity [Olaf Eisen, Germany]	Rejected. This statements refers to feedbacks to temperature increases, and thus mentioning "temperature" in this statement would not make sense.
46804	149	48	149	48	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. The text was formalises as per IPCC uncertainty language.
56012	149	49	149	49	See previous comments above on Greenland threhold levels, consider adding," In contrast, some scenarios for both Greenland and the WAIS, especially at higher prolonged temperatires foresee threholds beyond which even subsequent cooling to 1.5 degrees may not be sufficient to halt sustained ice sheet loss. [Pamela Pearson, United States of America]	Accepted. This possibility emerges clearly from the revised text, for the case of the Greenland Ice sheet.
3672	150	1	150	5	Add a sentence in this paragraph stating that the West Antarctic Ice Sheet is subject to dramatic retreat due to its configuration with bedrock below sea level and lowering towards the interior of the ice sheet (marine ice sheet instability, Schoof (2007)). [David Docquier, Belgium]	Thank you for the comment - marine ice sheet instability is now a topic that features prominently in this subsection, but also in section 3.3.
3834	150	4			modeling. However … - split sentence [Olaf Eisen, Germany]	Not applicable - This section was rewritten
13886	150	8	150	8	Please add the role of Pacific circulation, Indonesian throughflow (Pacific-Indian Ocean Exchange; see i.e. Gupta et al., 2016; Feng et al., 2017), and Indian to Atlantic ocean. Sen Gupta, A., S. McGregor, E. van Sebille, A. Ganachaud, J. N. Brown, and A. Santoso (2016), Future changes to the Indonesian Throughflow and Pacific circulation: The differing role of wind and deep circulation changes, Geophys. Res. Lett., 43, 1669–1678, doi:10.1002/2016GL067757. Feng, M., X. Zhang, B. Sloyan, and M. Chamberlain (2017), Contribution of the deep ocean to the centennial changes of the Indonesian Throughflow, Geophys. Res. Lett., 44, 2859–2867, doi:10.1002/2017GL072577. exchange [Raden Dwi SUSANTO, United States of America]	Many thanks for pointing out these important papers, however, the findings therein are not directly relevant to climate impacts under 1.5 vs 2 degrees C of global warming.
16408	150	8	150	17	The "thermohaline circulation" is a global system, but there's no mention of the Southern Hemipshere in this paragraph. [Australia]	The text refers to AMOC as a key component of the thermohaline circulation.
34754	150	8	150	17	This section is almost a complete repeat of page 56 lines 1-4, so the previous comment also applies here. [Jaime Palter, United States of America]	The section has been made more concise, but the discussion on AMOC is essential as a potential global singular event under RFC5.
22326	150	15			Consider deletion of "The surface layers of the ocean will continue to warm and acidify but rates will continue to vary regionally". It is true but repeated and not really important in this subheading. [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22328	150	19			Add a subheading on El Niño? [LUIS VALDES, Spain]	Thanks. Section is included.
652	150	20	150	26	Why is the role of land in the global carbon cycle not mentioned here? [Maria Jesus Iglesias Briones, Spain]	This section deals with the potential for large scale singular events to occur under 1.5 vs 2 degrees C of global warming. The Southern Ocean is thought to be critical in this context in terms of the potential thresholds to be exceeded under these levels of warming, but the same does not hold for the land-surface.
16410	150	21	150	21	Why might the "net sink of carbon…reduce under global warming"? [Australia]	Such changes may occur for a variety of reasons varying from changes in ocean circulation and the thermohaline circulation through to changes in storm tracks and related surface mixing in the Southern Ocean. SR1.5 do not address these aspects in detail though, due to their prominence in the upcoming Special Report on the Oceans and Cryosphere.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
4206	150	29	150	29	Regional analysis of avoided costs between 1.5°C and 2°C global temperature goals' would be better (see also comment # 129 above). [Greece]	Rejected. The section does not only discusses avoided costs, but also aspects such as differences in economic growth at 1.5 vs 2 degrees C of global warming, and thus the "benefits" is more appropriate for the title of this section than "avoided costs".
22330	150	29			Do you really think that the use of the term "benefit" is helping here to understand that you are talking about net losses? I think that the language has to be neutral, why not use impact, losses, costs instead of "benefit"? [LUIS VALDES, Spain]	The section is not only about losses and damages, but also about climate impacts on economic growth. The term "benefit" is certainly of value within this overarching context.
53434	150	29	150	29	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication
53552	150	29	150	29	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication
4208	150	33	150	33	many' instead of 'myriad' [Greece]	Not applicable - This section was rewritten
18500	150	35	150	38	Add to the list of factors that affect costs and benefits also choices in terms of adaptation efforts. [Andrea TILCHE, Belgium]	This section deals in particular with regional economic impacts, whilst adaptation efforts and options are dealt with extensively in Chapter 4.
12142	150	45	150	46	Could you just clarify that this statement ("advantages in some sectors….") is indeed just referring to costs of mitigation outweighing benefits in some specific sectors. As written it sort of reads as though it's applying to mitigation as a whole (which would obviously be a fairly major point!). [United Kingdom (of Great Britain and Northern Ireland)]	Yes, this refers to mitigation costs in specific regions and sectors may hold risks for crop production - the final form of the text is clear in this regard, and most certainly does not refer to the global mitigation effort as a whole.
3742	150	50			International [Castor Muñoz Sobrino, Spain]	Accepted - Text was revised with the suggested edit
8840	150	50	150	50	Internationa trade' should be 'International trade' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22332	150	50			replace "Internationa" by "International" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
45634	151	1	151	3	Check this sentence. It seems incomplete. [Adela M Sánchez-Moreiras, Spain]	Not applicable - This section was rewritten
8842	151	2	151	2	tropics that are' should be 'tropics are' [Robert Shapiro, United States of America]	Rejected - text is correct
24184	151	4	151	4	3 C [Mustafa Tufan Turp, Turkey]	unclear what this comment refers to
36008	151	4	151	7	Statistically significant reductions in GDP per capita growth are projected across much of the African continent, southeast Asia, India, Brazil and Mexico. However, no statistically significant changes in GDP are projected to occur over most of the developed world (Petris et al., 2017). We are not in agreement to the statement that 'significant reduction in GDP per capita growth is projected in India', this is contrary to most of the available estimates including that of World Economic Outlook reports [India]	After careful consideration we have decided to retain this statement in the text, but it has been qualified as being based on "limited evidence".
1018	151	5	151	8	Says “Statistically significant reductions in GDP per capita growth are projected across much of the African continent, southeast Asia, India, Brazil and Mexico. However, no statistically significant changes in GDP are projected to occur over most of the developed world (Petris et al., 2017)”. Reference: Saha, A., Ghosh, S., Sahana, A. S., & Rao, E. P. (2014). Failure of CMIP5 climate models in simulating post?1950 decreasing trend of Indian monsoon. Geophysical Research Letters, 41(20), 7323-7330. The study by Petris et al (2017) uses the projected changes in temperature and precipitation under global warming to derive the impact on GDP. However, many studies (e.g. Saha et al. 2014) - including the current draft of SR15 itself - have shown that the uncertainty in these projections are high over the Asian monsoon region, and there is very low confidence in the results. SR 15 Pag 3-160, L37-38 says “there is still low confidence in overall projected changes in monsoons because of insufficient agreement between climate models”. It continues to say “low confidence regarding changes in monsoons at these low global warming levels, as well as regarding the differences between responses at 1.5°C vs. 2°C levels of global warming”. This means that the uncertainty in the projected GDP over India is quite high. Hence, “India” should be removed from the list of countries for which a “statistically significant” reduction in GDP per capita growth is projected. [Roxy Mathew KOLL, India]	After careful consideration we have decided to retain this statement in the text, since it is based on peer-reviewed literature, but it has been qualified as being based on "limited evidence". Also note that the statement does not explicitly depend on the ability of climate models to represent the Indian Monsoon system, but on a range of factors impacting on economic growth, including increases in temperature.
8844	151	5	151	5	for developingversus developed' should be 'for developing versus developed' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
22334	151	5		16	Correct spaces between words (e.g. lines 5, 10, 16) [LUIS VALDES, Spain]	Thanks. Text was revised.
36010	151	5	151	8	The study by Petris et al (2017) uses the projected changes in temperature and precipitation under global warming to derive the impact on GDP. However, many studies (e.g. Saha et al. 2014) - including the current draft of SR 1.5 itself - have shown that the uncertainty in these projections are high over the Asian monsoon region, and there is very low confidence in the results. SR 1.5 Pag 3-160, L37-38 says “there is still low confidence in overall projected changes in monsoons because of insufficient agreement between climate models”. It continues to say “low confidence regarding changes in monsoons at these low global warming levels, as well as regarding the differences between responses at 1.5°C vs. 2°C levels of global warming”. This means that the uncertainty in the projected GDP over India is quite high. Hence, “India” should be removed from the list of countries for which a “statistically significant” reduction in GDP per capita growth is projected. [India]	After careful consideration we have decided to retain this statement in the text, since it is based on peer-reviewed literature, but it has been qualified as being based on "limited evidence". Also note that the statement does not explicitly depend on the ability of climate models to represent the Indian Monsoon system, but on a range of factors impacting on economic growth, including increases in temperature.
22336	151	14			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
24240	151	14	151	14	Warren b et al.)" missing reference year and what is the meaning of "b" [Nazan AN, Turkey]	Not applicable- text was deleted.
594	151	16	151	17	Hsiang et al 2017 provide a regional damage function for the US that could be used to distinguish impacts and 1.5 vs 2°C (and is in a subsequent box) [Robert Koppu, United States of America]	The study of Hsiang et al. (2017) is indeed referred to extensively in the final form of the Chapter, including this section. Moreover, Box 3.6 reports in detail on this study.
3744	151	16			distinguishing [Castor Muñoz Sobrino, Spain]	Not applicable - This section was rewritten
8846	151	16	151	16	costs distinguisging between' should be 'costs distinguising between' [Robert Shapiro, United States of America]	Not applicable- text was deleted.
3674	151	20			It is strange to assess benefits of both 1.5 and 2°C warmings vs. higher levels of warming, while the purpose of Section 3.5 is to compare 1.5 and 2°C warmings. I am wondering whether this sub-section is necessary. [David Docquier, Belgium]	Accepted. In The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.
22338	151	20			I think this section 3.5.4 can be merged with 3.5.3, and again I do not think that the word "benefits" is a good choice for the title. [LUIS VALDES, Spain]	Accepted. In The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.
60620	151	20	151	20	If this section (3.5.4) is retained, the heading should delete the ending phrase "as opposed to lower mitigation futures". It is not clear what that means in relation to 1.5 and 2°C pathways. [United States of America]	Accepted. In The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
60622	151	20	152	2	This section should be deleted because it provides no added value compared to the ample material already present in the chapter and because it does not even address what is advertised in the subheading – i.e., it does not provide any information on "temperature increases associated with the Paris Agreement NDCs." [United States of America]	The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.
49234	151	22	152	2	Unlike stated in its title, this section lists the results of a few studies that compare the impacts at 1.5 and 2°C compared to lower mitigation futures but without making the link with the NDCs [Bill Hare, Germany]	The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.
43184	151	24	151	30	Byers et al shows that avoiding 3.0°C compared to 2.0°C, would reduce the global population exposed to risks in multiple sectors by over 1 billion people. (Figure 4) [Edward Byers, Austria]	The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming. The study of Byers et al. (2018) is referred to extensively in Sections 3.4 and 3.5, however.
43186	151	24	151	30	Byers' study on multi-sector risks also shows these disproportionate benefits that are mentioned in this paragraph. Achieving 1.5°C constrains risks in most places to low levels and single sectors, except Asia. 2.0°C and beyond not only brings more more moderate and high risks in more locations, but also (critically) in multiple sectors. [Edward Byers, Austria]	The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming. The study of Byers et al. (2018) is referred to extensively in Sections 3.4 and 3.5, however.
50690	151	24	151	30	Byers' study on multi-sector risks also shows these disproportionate benefits that are mentioned in this paragraph. Achieving 1.5°C constrains risks in most places to low levels and single sectors, except Asia. 2.0°C and beyond not only brings more more moderate and high risks in more locations, but also (critically) in multiple sectors. [Bastiaan van Ruijven, Austria]	The section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming. The study of Byers et al. (2018) is referred to extensively in Sections 3.4 and 3.5, however.
22340	151	29			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Not applicable - This section was rewritten
35230	151	29	151	29	The year of study is missing in cittaion Warren et al. [Shaukat Ali, Pakistan]	Not applicable- text was deleted.
17840	152				The Zoning of region can be classified with Latitude: Low-Latitude, Mid-Latitude, and High-Latitude.The mid-latitude zone can be broadly defined as part of the hemisphere between 30°–60° latitude. This zone is home to over 50 % of the world population and encompasses about 36 countries throughout the principal region, which host most of the world's development and poverty related problems. Moon, J., Lee, W.K., Song, C., Lee, S.G., Heo, S.B., Shvidenko, A., Kraxner, F., Lamchin, M., Lee, E.J., Zhu, Y., Kim, D., Cui, G. 2017. An introduction to Mid-Latitude ecotone: Sustainability and environmental challenges. Sib. J. For. Sci. N. 6:41-53. [Republic of Korea]	Thanks for the comment. It is no longer relevant, however, given that the section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.
22342	152	2			In order to facilitate a standard for comparison and also to facilitate the reading, currencies must be converted into USD. [LUIS VALDES, Spain]	Not applicable - This text was deleted
60624	152	4	152	12	This is introductory framing material (Interpretations of different definitions of 1.5°C) and therefore should either be moved and integrated with appropriate text at the beginning of the chapter or be deleted. [United States of America]	Thanks for the comment. It is no longer relevant, however, given that the section has been removed to avoid repetition with other sections in Chapter 3, and given the limited scope of SR1.5 on impacts at 1.5 vs 2 degrees C of warming.
49236	152	15			This section appears to be in disconnect to the report above (very little cross-referencing, etc.). This is worrying as it, rather than integrating information, is yet another assessment of changes, this time basically on the regional scale. Furthermore, 3.5.5. and 3.5.6 could be merged. They are partly indentical anyways. [Bill Hare, Germany]	Sections 3.5.5 and 3.5.6 have been significantly revised since the SOD, the first deals with climate change hot-spots, and the second with regional tipping points, and have therefore been retained as separate sections.
52628	152	15	152	15	Would suggest inserting a visual map of the world that is overlain by a sliding colour tone that represents cumulative risks for any given area (use SREX regions). For example, Arctic regions have a high risk of temperature change + risk of permafrost loss + changing vegetation limits + economic impact of infrastructure loss + socio-economic impact from changing ecosystem services....etc) These could be represented on a scale of 1-100 of cumulative risks for each type of impact (1-5). The map would also include small boxes with icons representing those components that are included in the risk and vulnerabilities for each region. [Charlotte Roehm, United States of America]	Thank you for this interesting suggestion. We have after some consideration decided not to implementing this suggestion, given the complexities of trying to weigh the relative importance of different risks for specific regions.
61930	152	15	156	40	The title of the section is strange ("reducing hot spots"). I do not understand what is meant by these words. There is an awful amount of repetition from earlier sections. Is this section intended to provide a regional synthesis of "risk hotspots"? Then what is the use of the regional boxes, with strong overlap? Please give as much attention to low lying coasts (incl. deltas) than small islands. I would strongly suggest that the authors use boxes for each of these issues, move everything related to these hotspots in the boxes (nothing left in any other part of the text of any section) to avoid dramatic repetition. The Table 3.7 on emergence has an implicit link to the notion of "time of emergence", which has a special meaning in climate science (signal significantly detected out of the noise). Please check that the statements are coherent with such assessments. This table is a nice piece of synthesis and should be cited in all relevant sections of text, to ensure traceable accounts (one should be able to link the assessement of the literature to the findings in this table). [Valérie Masson-Delmotte, France]	With a reduction in "hot spots" is meant avoiding or reducing impacts in those regions of the world most vulnerable to climate change. The section has been revised extensively to provide a regional synthesis of climate change hot-spots, and to consolidate the discussion for such regions for impacts ranging from physical climate change science impacts (section 3.3) to impacts on ecosystems and humans systems (sections 3.4 and 3.5). The comment around regional boxes is rejected. Far more regions are discusses as "hot-spots" than there are boxes. Table 3.7 has been updated in the final version of the paper using an extended set of literature.
34758	152	20	152	20	ambitions should be "ambitious" [Samantha Grover, Australia]	Not applicable. Section as revised.
60626	152	27	153	2	This section on Arctic sea ice is not fundamentally different from previous Arctic ice sections. Consolidate with 3.4.3.5.1. [United States of America]	The discussion in this section has been revised, and now gives a concise summary of impacts in terms on Arctic sea-ice, ranging from impacts on the physical climate system through to ecosystems.
12144	152	28	153	2	Lots of this also covered multiple times in previous sections - summarise to shortern chapter [United Kingdom (of Great Britain and Northern Ireland)]	The discussion in this section has been revised, and now gives a concise summary of impacts in terms on Arctic sea-ice, ranging from impacts on the physical climate system through to ecosystems.
42798	152	28	153	2	As for timing of when the Arctic becomes ice-free, there is a wide range of years. Trends suggest ice-free Arctic within the next decade, stochasters project an ice-free Arctic around 2030, and modeling studies reflect an ice-free Arctic around mid-century but potentially as early as 2040. Internal variability in the climate system, however, adds about two decades of uncertainty around these projections. Overland J. E. & Wang M. (2013) When will the summer Arctic be nearly sea ice free?, GEOPHYSICAL RESEARCH LETTERS 40:2097–2101. Jahn A., et al. (2016) How predictable is the timing of a summer ice-free Arctic?, GEOPHYSICAL RESEARCH LETTERS 43:9113–9120, 9113 ("Based on results from large ensemble simulations with the Community Earth System Model, we show that internal variability alone leads to a prediction uncertainty of about two decades, while scenario uncertainty between the strong (Representative Concentration Pathway (RCP) 8.5) and medium (RCP4.5) forcing scenarios adds at least another 5 years. Common metrics of the past and present mean sea ice state (such as ice extent, volume, and thickness) as well as global mean temperatures do not allow a reduction of the prediction uncertainty from internal variability."). [Kristin Campbell, United States of America]	Many thanks for these references. We have included the insights of Jahn et al. (2016) and Jahn (2018) in the discussion, and also in that of section 3.3.8.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
43038	152	28	153	2	As for timing of when the Arctic becomes ice-free, there is a wide range of years. Trends suggest ice-free Arctic within the next decade, stochasters project an ice-free Arctic around 2030, and modeling studies reflect an ice-free Arctic around mid-century but potentially as early as 2040. Internal variability in the climate system, however, adds about two decades of uncertainty around these projections. Overland J. E. & Wang M. (2013) When will the summer Arctic be nearly sea ice free?, GEOPHYSICAL RESEARCH LETTERS 40:2097–2101; Jahn A., et al. (2016) How predictable is the timing of a summer ice-free Arctic?, GEOPHYSICAL RESEARCH LETTERS 43:9113–9120, 9113 ("Based on results from large ensemble simulations with the Community Earth System Model, we show that internal variability alone leads to a prediction uncertainty of about two decades, while scenario uncertainty between the strong (Representative Concentration Pathway (RCP) 8.5) and medium (RCP4.5) forcing scenarios adds at least another 5 years. Common metrics of the past and present mean sea ice state (such as ice extent, volume, and thickness) as well as global mean temperatures do not allow a reduction of the prediction uncertainty from internal variability."). [Durwood Zaelke, United States of America]	Many thanks for these references. We have included the insights of Jahn et al. (2016) and Jahn (2018) in the discussion, and also in that of section 3.3.8.
43040	152	28	153	2	The statement about the advantages for shipping and trade seem to be gratuitous; and if they are kept, they should be elaborated with a statement that increased shipping likely will add more black carbon to the Arctic, which will further accelerate the loss of sea ice. This change in albedo is in addition to the naturally occurring alterations of albedo that comes from algae that blooms on the surface of Greenland that causes and acceleration of warming and additional melting in the area. Lutz S., et al. (2016) The biogeography of red snow microbiomes and their role in melting arctic glaciers, NATURE COMMUNICATIONS 7(11968):1–9. [Durwood Zaelke, United States of America]	The potential advantages around a longer shipping season in the Arctic is well-founded in the literature (see section 3.4 of the final version of the chapter). However, we have indeed not discussed this aspect of Arctic-change in the final version of this section.
142	152	30	152	30	C(t.b.c. "C (" [teodoro georgiadis, Italy]	Not applicable. Section as revised.
22344	152	30		49	Correct spaces between words (e.g. lines 30, 31, 35, 40, 43, 49) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
8848	152	31	152	31	are likelyin the' should be 'are likely in the' [Robert Shapiro, United States of America]	Not applicable. Section as revised.
46806	152	31	152	31	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has ben carefully revised in rephrased in terms of IPCC uncertainty language.
35348	152	32			Niederdrenk and Notz - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Publication year was added.
35232	152	33	152	33	The spacing is missing between words "likelyin" [Shaukat Ali, Pakistan]	Not applicable. Section as revised.
22346	152	34			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Section was revised and publication year was added.
34122	152	34	152	35	Please spell "probability" correctly. [Norway]	Accepted. Text was revised with the suggested edit
35350	152	34			Jahn - missing year of publication [Andrey Kalugin, Russian Federation]	Section was revised and publication year was added.
45636	152	34			Correct probibability [Adela M Sánchez-Moreiras, Spain]	Accepted. Text was revised with the suggested edit
35352	152	37	152	38	Niederdrenk and Notz; Jahn; Ridley and Blockley - missing year of publication [Andrey Kalugin, Russian Federation]	Section was revised and publication year was added.
34124	152	38	152	39	Please spell sea ice without "-". [Norway]	Editorial - copyedit to be completed prior to publication
44606	152	38	152	38	Notz; Screen and Williamson, 2017)(Jahn; Ridley and Blockley). There is, however, [Rita Man Sze Yu, China]	Section was revised and publication year was added.
2290	152	39	152	45	Again, I am not sure that the Niederdrenk and Notz GRL paper is cited correctly. They say that (quote) « most likely, the Arctic Ocean becomes ice free throughout September at a global warming of between 1.7 ?C and 2.2 ?C relative to pre-industrial levels ». Between 1.7 and 2.2, not, as written in the draft, 1.7 plus/minus 0.2. [gerhard Krinner, France]	Thank you for the comment. We have revised the statements attributed to the Niederdrenk and Notx (2018) study.
22348	152	41			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Section was revised and publication year was added.
46808	152	41	152	41	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The section has been carefully revised in terms of using formal IPCC uncertainty language.
143	152	43	152	43	.Finally t.b.c. ". Finally" [teodoro georgiadis, Italy]	Accepted. Space was inserted.
8850	152	44	152	44	only little ice' should be 'only a little ice' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
307	152	47	152	47	.....results in advantages for..... [Paul Doyle, Canada]	Not applicable. Text was deleted.
3676	152	47			Separate 'in' and 'advantages'. [David Docquier, Belgium]	Not applicable. Section as revised.
8852	152	47	152	47	results inadvatages for' should be 'results in advantages for' [Robert Shapiro, United States of America]	Not applicable. Text was deleted.
9576	152	47	153	2	Line 47 should read "in advantages", and not "inadvantages". Furthermore, the impacts on and perspectives of opening shipping and trade routes from Inuit and communities should also be noted here. The Inuit Circumpolar Council did a report on sea ice as it related to shipping in Inuit Nunaat (Inuit homeland) for the Sustainable Development Working Group of the Arctic Council and this should be referenced here: http://www.sdwg.org/wp-content/uploads/2016/04/Inuit-Response-to-AMSA-Final-Report.pdf [Joanna Petrasek MacDonald, Canada]	The editorial correction has been made. Advantages around shipping trade in a warming climate in the Arctic are discussed extensively in Section 3.4 of the final version of the chapter, but this discussion has been omitted from the "hot spot" section.
34126	152	47	152	47	Please spell "advantages" correctly and add a space before of the word. [Norway]	Not applicable. Text was deleted.
34128	152	47	142	49	Is the growth 115% in the sense that it is more than doubled? If this is correct, please consider to add "by" 115%. [Norway]	Not applicable. Section as revised.
35234	152	47	152	47	The spacing is missing between words "inadvantage" [Shaukat Ali, Pakistan]	Not applicable. Text was deleted.
38398	152	47	152	51	On the economic impacts of ice-free summers the paper from Gonzalez-Eguino et al 2017 shows the significant economic implications that this will have under recovery and non-recovery (tippin-point) scenarios. Our results show that sea-ice melting in the Arctic requires more stringent mitigation efforts globally and highlights the need for a better understanding of how the rapid changes observed in the Arctic may impact our society.González-Eguino, M., M. B. Neumann, I. Arto, I. Capellán-Perez, and S. H. Faria, (2017), Mitigation implications of an ice-free summer in the Arctic Ocean, Earth's Future, 5: 59–66 [Mikel González-Eguino, Spain]	Thank you for pointing out this interesting study. We have not included it in this section, however, given the focus on comparing impacts in climate-change impacts in hot-spot regions under 1.5 vs 2 degrees C of global warming.
49444	152	47	153	2	The information on Arctic navigation should be complemented with studies on the projected changes of transit navigation duration through Northern Sea Route under RCP scenarios in the 21st century. The following literature can be reviewed: Mokhov et al., 2016, doi: 10.1134/S1028334X16060209; Khon et al., 2017, doi: 10.1088/1748-9326/aa5841; Ng et al., 2018, doi: 10.1002/wcc.507. [Alexander Chernokulsky, Russian Federation]	Thank you for the comment. Implications of a warming climate for shipping in the Northern Sea Route are discussed in section 3.4.9 of the final version of the chapter, but this discussion has been omitted from the "hot spot" section.
3678	152	48			Add 'by' before 'grown'. [David Docquier, Belgium]	Not applicable. Section as revised.
17700	153		159		It is needed to add sentences of climate change over East Asia region in 3.5.5 section and Table 3.7, following IPCC AR5 chapter 14 at least, because East Asia is a vulnerable region to increased extreme temperature, water scarcity, drought, heavy rainfall, and Asian summer monsoon due to results of papers listed up in "4" and "5" comments. [Republic of Korea]	Many thanks for the comment, and we are in agreement that East Asia is also an area vulnerable to a range of impacts. However, here we focus on south-east Asia as a climate change hot-spot due to the range of risks it is projected to be vulnerable to, in addition to the region's relatively low adaptive capacity

Comment No	From Page	From Line	To Page	To Line	Comment	Response
56014	153	2	153	2	Consider adding, "especially in light of corresponding impacts at lower latitudes of Arctic temperature levels necessary to support such activities." [Pamela Pearson, United States of America]	We have omitted the discussion of shipping trade from the hot-spot section, but it features extensively in section 3.3.9.
654	153	5	153	28	Once again, peatlands deserve a mention here please. Instead, avoid mentioning alpine regions in two sections (P153 L13-14 & L17) [Maria Jesus Iglesias Briones, Spain]	Peatlands are discussed extensively in section 3.4, but have not been selected for the discussion around regional hot-spots at 1.5 vs 2 degrees C of global warming.
34130	153	5	153	14	3.5.5.2 Arctic land regions: Adding content and references that mention also the other organism groups inhabiting tundra would benefit this subsections. Mammals, birds, invertebrates, and their interactions with vegetation as well as relationships with the abiotic system can be as dependent or even more tightly linked to climate change than that of vegetation (trees). A thorough summary can be found in ABA Terrestrial ecosystems chapter and references therein. Please consider balancing the text accordingly. [Norway]	Rejected. The discussion is restricted to peer-reviewed literature relevant to impacts at 1.5 vs 2 degrees C of warming.
2292	153	6	153	8	There is ample literature discussing the reasons for Arctic amplification, and the snow-albedo-temperature feedback is only one of the mechanisms at play. It might be relatively more important on land, but even that isn't sure. [gerhard Krinner, France]	This section deals with impacts on the Tundra under different degrees of global warming, rather than with the physical mechanisms at play in the region (such as Arctic amplification)
8854	153	7	153	7	a given a certain' should be 'a given certain' [Robert Shapiro, United States of America]	Not applicable. The section was revised.
7252	153	17	153	28	Wouldn't "alpine" benefit from being replace with "High mountains areas" ? I don't think "alpine" can be used to refer to the High Mountains of Asia (not usually the case), and using the term "High Mountains" would make this somewhat consistent with the outline of SROCC. More generally, I find mountain areas and the cryosphere very much absent from this chapter, with a few exceptions, and either this can be solved (see e.g. the recent article from Kraijenbrink et al., 2017 on the impact of 1.5 vs 2°C for the fate of glaciers in the Himalaya, not cited in the report, whose absence in the assessment is hard to understand : P. D. A. Kraaijenbrink, M. F. P. Bierkens, A. F. Lutz & W. W. Immerzeel, Impact of a global temperature rise of 1.5 degrees Celsius on Asia's glaciers Nature, 2017, doi:10.1038/nature23878). This comment applies not only to this section, but also the section on "water" [Samuel MORIN, France]	We have used the term "alpine" more generally than in terms of its geographical meaning of the "alpine countries", that is, we use "alpine" as a synonym for "high mountains". Section 3.5.5.3 focus specifically on impacts at 1.5 vs 2 degrees of warming, and thus we have not referred to the paper of Kraaijenbrink et al. (2017), but this paper, given its topic, should feature strongly in the SROCC, and we have made this recommendation to the SROCC authors.
60628	153	17	153	28	This section projects major impacts, but lacks specificity about the effects. If the reference is to reduced distribution and abundance of alpine vegetation, most alpine systems have in fact been very stable for the entire Holocene, and will likely be "protected" by increased fire and other stressors that tend to prevent trees from advancing upward in elevation. [United States of America]	Rejected. The statements in the section are based on peer-reviewed literature indicating the likely biome shifts in alpine regions, even under 1.5 degrees C of global warming.
8856	153	21	153	21	obvious limited by mountain' should be 'obvious limits due to mountain' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
30528	153	21	153	21	Typo: obviously [France]	Editorial - copyedit to be completed prior to publication
34760	153	21	153	21	with obvious limited should be "which is obviously limited" [Samantha Grover, Australia]	Editorial - copyedit to be completed prior to publication
35236	153	21	153	21	The words "not obvious" are not needed in the sentence. [Shaukat Ali, Pakistan]	Editorial - copyedit to be completed prior to publication
34762	153	24	153	26	The sentence about Tibetan grasslands is very unclear. Has the area of grasslands decreased? Or is it the NPP that has decreased? Make clear the link with climate change: has it decreased because grass species don't function so well at higher temperature? or is there less rain/snow in the region? has the area decreased due to erosion/degradation? [Samantha Grover, Australia]	We have removed these specific statements from the text, but we are still making use of this reference as indicative of the potential for changes in biomes in alpine regions under different degrees of global warming.
16412	153	31	153	46	It is not clear why Southeast Asia is chosen here, compared with e.g. South Asia, which includes countries like Bangladesh with huge vulnerability to sea level rise and countries like India with huge vulnerability to changes in the monsoon, and seasonal meltwater runoff. [Australia]	Southeast Asia is discussed as a geographical region that is a climate change hot-spot un terms of a range of impacts, including (but not limited to) sea-level rise, as indicated in this section. A variety of vulnerabilities relevant to India and Bangladesh are discussed elsewhere in the Chapter, however.
41452	153	31	153	46	confidence levels please. In some cases, only one reference is cited. [Lourdes Tibig, Philippines]	The section has been revised to include confidence statements and formal IPCC uncertainty language.
49970	153	31	153	46	Howabout the impacts of drought? There are many semiarid regions in SEA and also issues with water supply. [Perdinan Perdinan, Indonesia]	We have limited the discussion to impacts described in the peer-reviewed literature at 1.5 vs 2 degrees C of global warming.
43190	153	32	153	46	Byers et al study shows southeast Asia to be highly exposed to impacts across multiple sectors (hotspots using multiple indicators in water energy and land) - and it is also location of many tens of millions of vulnerable people (low incomes). These are key " hotspots" as they combine (impacts X vuilnerability) and may be worth mentioning here. See tables S5/S6 in Supplementary information. [Edward Byers, Austria]	Thank you for the reference, which are now using extensively across sections 3.4 and 3.5 in the final version of the Chapter.
49482	153	32	153	37	Paper just accepted and very relevant to this section - Brown b et al. (Regional Env Change) regarding flooding and sea-level rise in the GBM delta. [Sally Brown, United Kingdom (of Great Britain and Northern Ireland)]	Thank your for the reference, which we have made use of in Section 3.4 - it is not relevant to the discussion on southeast Asia, however.
50692	153	32	153	46	Byers et al study shows southeast Asia to be highly exposed to impacts across multiple sectors (hotspots using multiple indicators in water energy and land) - and it is also location of many tens of millions of vulnerable people (low incomes). These are key " hotspots" as they combine (impacts X vuilnerability) and may be worth mentioning here. See tables S5/S6 in Supplementary information. [Bastiaan van Ruijven, Austria]	Thank you for the reference, which are now using extensively across sections 3.4 and 3.5 in the final version of the Chapter.
22350	153	33			insert space between "et al.).Countries" [LUIS VALDES, Spain]	Not applicable. Section was revised.
22352	153	33			add "year" in citation or delete the reference (one case in this line) [LUIS VALDES, Spain]	Accepted. Reference was deleted.
35354	153	33			Warren et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Reference was deleted.
34766	153	36	153	36	add sentence after the one about slum. Between 20016c). And Risks add the following " The risk from flooding is compounded by land subsidence, which is occuring at rates of 4.5-11cm/year in drained peatlands in Indonesia (Viktor Boehm, Veraldo Liesenberg, Suwido Limin (2013) Multi-airborne lidar survey and field measurements of tropical peat swamp forest to monitor changes, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing. Vol6,no3, pp1524-1530) [Samantha Grover, Australia]	Thank you for the reference. However, in this section we are restricting the discussion to papers focussing on impacts at 1.5 vs 2 degrees C of global warming.
8858	153	37	153	37	display statistically' should be 'displays statistically' [Robert Shapiro, United States of America]	Accepted. Text was changed with the suggested edit.
34764	153	37	153	37	display should be displays [Samantha Grover, Australia]	Accepted. Text was changed with the suggested edit.
22354	153	39			A comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	The section was revised and commas were added in between of authors names and year of publications.
35356	153	39			Seneviratne et al. - missing year of publication [Andrey Kalugin, Russian Federation]	The section was revised and year of publication added.
22356	153	41			insert space between "levels(Sch" [LUIS VALDES, Spain]	Accepted. Space was inserted.
22358	153	45			replace "wet bulb" by "wet-bulb" or "heat stress" [LUIS VALDES, Spain]	Not applicable. The section was revised.
43188	153	46	153	46	It is not clear to me that Schleussner 2016b actually used wet-bulb temperature? This is not mentioned in the main body of the manuscript so worth checking directly with author. [Edward Byers, Austria]	This is a technical aspect that do not require changes to how the paper or its content is being referred to in the text of Chapter 3.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
12146	154	1	154	22	Make sure this section focuses on the cliamte change risk hotspot elements of the science, not just repeating previous sections on the Mediterranean [United Kingdom (of Great Britain and Northern Ireland)]	The section has been revised to focus specifically on the Mediterranean as a climate change hot-spot under 1.5 vs 2 degrees C of global warming.
43200	154	2	154	22	Byers et al (Fig 1, 3, Supplementary info) show that the poulation exposed to multiple climate impacts in the Mediterranean region is substantially higher (on a proportional basis) than for other European regions. Key risks include water stress (incl. agriculturally driven), increase in drought intensity, heat stress events and nitrate leaching. [Edward Byers, Austria]	Thank you for the reference, which is now used widely in Sections 3.4 and 3.5. In the case of 3.5.5.5, it did not add particular value to the existing references that outlay differences in a range of impacts in the Mediterranean under 1.5 vs 2 degrees C of warming.
22360	154	3		51	A comma must be inserted in between of the authors names and the year of publication (muliples lines in this page, e.g., 3, 11, 44, 51) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
22362	154	9		46	add "year" in citation or delete the reference (many cases in this page, e.g. 9, 11, 28, 29, 46) [LUIS VALDES, Spain]	Accepted. Text was changed with the suggested edit.
35238	154	9	154	16	the year of study is missing in cittaion Thober et al. and Doell et al. [Shaukat Ali, Pakistan]	Accepted. Year was added.
36012	154	9			Year of the reference needs to be added [India]	The section has been revised and all references are properly sited in terms of the year of publication.
55334	154	11	154	11	add space: "2014;Jacob" [ELISA BERDALET, Spain]	Not applicable. Section was revised.
46810	154	15	154	15	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised to include the use of IPCC uncertainty language.
57056	154	21			problem references "2016)Schleussner et al., 2016c" [AMANDINE PASTOR, France]	Accepted. Text was revised with the suggested edit
30530	154	24	154	24	In this chapter, you quote several times these results as from the WB. Actually, this WB report just quote Burke et al work (Shifts in African crop climates by 2050, and the implications for crop improvement and genetic resources conservation. Global Environ. Change (2009)) Some points about it: - "current conditions" are actually 1993-2002. - This study is based only on temperature distribution (no rainfall, radiation change) - please have a look at ramires villegas & thornton (2015) Climate change impacts on African crop production. CCAFS working paper. ==> the suitability change results are quite different for some crops like millet (2050s, RCP8.5 and positive change over the Sahel) We suggest to be more careful in using such results [France]	Thank you for the comment. In the final version of the Chapter we use this study for a single statement around crop yield, which we are confident about in terms of defensibility of the statement.
36902	154	25	155	14	Please check the following reference: The effects of 1.5 and 2 degrees of global warming on Africa in the CORDEX ensemble, Grigory Nikulin et al. 2018, Env. Res. Lett. in press http://iopscience.iop.org/article/10.1088/1748-9326/aab1b1 [Mustafa Tufan Turp, Turkey]	Thank you for the reference, which unfortunately became available too late for inclusion in the discussion.
10266	154	26	154	38	What are the potential impacts of incresed warming of 1,5° and 2,0°C on fisheries, costal management (human settlements and tourism), land and wetland management, water ressoruces management, health and livestock? [Cherif Diop, Senegal]	The section discusses these impacts in terms of water resources, health and livestock, but information in impacts on fisheries and coast under 1.5 vs 2 degrees C for Africa is limited.
12148	154	26	154	38	Same as comment 57 [United Kingdom (of Great Britain and Northern Ireland)]	The section discusses these impacts in terms of water resources, health and livestock, but information in impacts on fisheries and coast under 1.5 vs 2 degrees C for Africa is limited.
35358	154	27			1.5C - missing degree symbol [Andrey Kalugin, Russian Federation]	Accepted. Text was revised with the suggested edit
35240	154	29	154	29	Increase is grammatically correct instead of Increases in the sentence. [Shaukat Ali, Pakistan]	Not applicable. Section was revised.
8860	154	32	154	32	wet eventsin West' should be 'wet events in West' [Robert Shapiro, United States of America]	Not applicable. Section was revised.
35242	154	32	154	32	The spacing is missing between words "eventsin" [Shaukat Ali, Pakistan]	Not applicable. Section was revised.
8862	154	37	154	37	result infurther yields' should be 'result in further yield' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
8038	154	41	154	51	A recent study on the avoided impacts of 1.5C warming find that over the GM region, the avoided impacts by the 0.5°C less warming amount to 118% (57%-140% for the 25th-75th percentile) and 115% (29%-178%) for area and population exposures to 4? exceedance events, respectively. The increases in exposure to the upper tail extremes are related to increases in both the mean state and the variability of extreme precipitation with warming. Among sub-monsoon regions, South Africa is a primary hotspot. Details are referred to: Zhang W. et al. 2017: Reduced exposure to extreme precipitation by 0.5°C less warming for global land monsoon regions. Nature Communication, under review [Tianjun Zhou, China]	Thank you for the comment. This paper is being referred to in Section 3.4 of the final version of the Chapter.
8040	154	41	154	51	Shingirai et al. (2017) employed the impact-relevant Community Earth System Model (CESM) Low warming experiment simulations to study the historical record-breaking seasonal/annual mean climate extremes under the 1.5°C and 2°C targets in Africa. They find that limiting global warming to 1.5°C relative to 2°C would robustly reduce the frequency of heat extremes. The probability of occurrence of heat extremes similar to the record-hot December-February (DJF) of 1991/1992 in southern Africa and the DJF of 2009/2010 in north Africa would be reduced by 25% (20-29% for the 10-90% confidence intervals) and 20% (16-24%), respectively, if warming was kept to 1.5°C compared to 2°C. The avoided impacts on hydrometeorological extremes are less evident. This study highlights the reduced likelihood of climate extremes over Africa by realizing the 1.5°C warmer world, which is tied to economic losses and casualties.For details, please see: Shingirai Nangombe et al. 2017: Record-breaking Climate Extremes in Africa at 1.5°C 1 and 2°C of Global Warming. Nature Climate Change, under review [Tianjun Zhou, China]	The paper by Shingirai and Nangombe (2018) was unfortunately accepted too late to be included in the Chapter 3 discussion. However, section 3.5.5.7 does comment suitably, based on a number of peer-reviewed outputs, on the vulnerability of Africa to extreme temperature events under 1.5 vs 2 degrees C of global warming.
8864	154	42	154	42	rising subtropical regions' should be 'rising in subtropical regions' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
22364	154	46			add symbol for degrees, 1.5ºC [LUIS VALDES, Spain]	Accepted. Text was revised with the suggested edit
35360	154	46			1.5C - missing degree symbol [Andrey Kalugin, Russian Federation]	Accepted. Text was revised with the suggested edit
35362	154	46			Weber et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Year was added.
36014	154	46			Year of the reference needs to be added [India]	The section has been revised and all references are properly sited in terms of the year of publication.
46812	154	48	154	48	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised and now includes the use of formal IPCC uncertainty language.
13956	155	6	155	6	accumulated cyclonic energy is projected to decrease over the southern Indian Ocean I don' think this communicates well with the audience. Please say something like the sum of the strength in tropical cyclones [Natalie MAHOWALD, United States of America]	Not applicable. The section was revised.
35244	155	7	155	7	Decrease is grammatically correct instead of decreases in the sentence. [Shaukat Ali, Pakistan]	Not applicable. The section was revised.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
35364	155	7	155	8	Mavhungu et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Not applicable. The text was deleted.
7644	155	8	155	8	...under 2°C of global.. [Jens Zinke, Germany]	Not applicable. The section was revised.
22368	155	8		50	add "year" in citation or delete the reference (many cases in this page, e.g. 8, 23, 26, 50) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
22366	155	11			add symbol for degrees, 1.5ºC and 2ºC [LUIS VALDES, Spain]	Section was revised and symbol for degree added.
35366	155	11			Mavhungu et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Section was revised and publication deleted.
35368	155	11			2C - missing degree symbol [Andrey Kalugin, Russian Federation]	Section was revised and symbol for degree added.
35370	155	11			1C - missing degree symbol [Andrey Kalugin, Russian Federation]	Section was revised and symbol for degree added.
7646	155	12	155	12	...posed by 2C of warming over 1C of… insert degree symbols [Jens Zinke, Germany]	Not applicable. The section was revised.
41454	155	17	155	30	is there some degree of confidence levels here? In one or two, are there no updated references? [Lourdes Tibig, Philippines]	The section has been updated with references and is now also formulated in terms of IPCC uncertainty language.
8866	155	18	155	18	The tropicsis a' should be 'The tropics is a' [Robert Shapiro, United States of America]	Accepted. The section was revised.
22370	155	18		50	Correct spaces between words (e.g. lines 18, 20, 22, 36, 43, 47, 5030, 31, 35, 40, 43, 49) [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
35246	155	18	155	18	The spacing is missing between words "tropicsis" [Shaukat Ali, Pakistan]	Accepted. The section was revised.
35248	155	19	155	25	Increase is grammatically correct instead of Increases in the sentence. [Shaukat Ali, Pakistan]	Editorial - copyedit to be completed prior to publication
35250	155	20	155	20	The spelling of occur is written incorrect as occure. [Shaukat Ali, Pakistan]	Accepted. Spelling was corrected.
8868	155	22	155	22	as well longer' should be 'as well as longer' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
35372	155	23			Weber et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Publication year was added.
36016	155	23			Weber et al, year to be added [India]	Accepted. Publication year was added.
7648	155	26	155	26	...(Weber et al.)… public. Year missing [Jens Zinke, Germany]	Accepted. Publication year was added.
35374	155	26			Weber et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Publication year was added.
18502	155	33	156	4	Broaden section title and content to cover risks for low lying islands, coasts and communities [Andrea TILCHE, Belgium]	Rejected. This section focuses specifically on small islands as a climate change hot spots, given the unique challenges these regions face under climate change, and not on coastal areas in general.
22374	155	34			Replace SIDs by SIDS [LUIS VALDES, Spain]	Accepted. Text was changed with the suggested edit.
46814	155	38	155	38	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The section has been formalised with IPCC uncertainty language and related confidence statements.
7650	155	42	155	42	..in a 1.5C.. insert degree symbol [Jens Zinke, Germany]	Accepted. Text was revised with the suggested edit
22372	155	42			add symbol for degrees, 1.5ºC [LUIS VALDES, Spain]	Accepted. Text was changed with the suggested edit.
35376	155	42			1.5C - missing degree symbol [Andrey Kalugin, Russian Federation]	Accepted. Text was changed with the suggested edit.
7652	155	43	155	43	..world (Rassmussen).. citation incomplete [Jens Zinke, Germany]	Accepted. Publication year added.
7654	155	46	155	46	…Karnauskas et al.)…. year missing [Jens Zinke, Germany]	Accepted. Publication year added.
35252	155	46	155	46	The word "with" is not needed in the sentence. [Shaukat Ali, Pakistan]	Accepted. Section was revised.
36018	155	46			Karnauskas et al, year to be added [India]	Accepted. Publication year was added.
35378	155	49			1.5C - missing degree symbol [Andrey Kalugin, Russian Federation]	Section was revised and degree symbols were added.
7656	155	50	155	50	...1.5oC(Taylor et al.)… year missing [Jens Zinke, Germany]	Accepted. Publication year added.
35380	155	50			Taylor et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Publication year was added.
36020	155	50			Taylor et al, year to be added [India]	Accepted. Publication year was added.
47276	156		156		Astrom et al (2013) Cited three times with completely identical statements on Page 121, Page 146 and Page 156 [Sarah Connors, France]	The text has been revised and references updated. The paper by Astrom et al. (2013) has been replaced by more recent publications.
7658	156	1	156	1	...(Rasmussen et al.)… year missing [Jens Zinke, Germany]	Accepted. Publication year added.
8870	156	1	156	2	is imperative to achieving' should be 'it is imperative to achieve' [Robert Shapiro, United States of America]	Not applicable. Section was revised.
35382	156	1			Rasmussen et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Section was revised and Publication year added.
36022	156	1			Year of the reference needs to be added [India]	Accepted and implemented.
8872	156	3	156	4	to challengestock thermoregulation resulting' should be 'to challenge stock thermoregulation resulting' [Robert Shapiro, United States of America]	Accepted. Section was rewritten.
22378	156	3		45	Correct spaces between words (e.g. lines 3, 39, 45) [LUIS VALDES, Spain]	Accepted. Sections was revised/ deleted.
35254	156	3	156	3	The spacing is missing between words "challengestock" [Shaukat Ali, Pakistan]	Accepted. Section was rewritten.
46816	156	3	156	3	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised in terms of IPCC uncertainty language and related confidence statements.
7660	156	4	156	4	...(Lallo et al.)…. year missing [Jens Zinke, Germany]	Accepted. Publication year added.
22376	156	4		42	add "year" in citation or delete the reference (e.g. lines 4, 42) [LUIS VALDES, Spain]	Accepted. Publication year added, and not applicable section was deleted.
35384	156	4			Lallo et al. - missing year of publication [Andrey Kalugin, Russian Federation]	Accepted. Publication year added.
36024	156	4			Year of the reference needs to be added [India]	Accepted and implemented.
46818	156	11	156	11	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised in terms of IPCC uncertainty language and related confidence statements.
2294	156	22	156	31	Section 3.5.5.11 on the « Transboundary Kailash Sacred Landscape ». Why a special section on this small area? This should be merged with section 3.5.5.3 and talk about mountain regions in general. Moreover, the name, "Transboundary Kailash Sacred Landscape », seems to follow some political or religious agenda and has little to do in an IPCC report which should be politically and religiously neutral if it wants to be taken seriously. The table 3.7 then lists that area with « to be investigated » in all columns, which means that there isn't much to assess. One sentence about this area, justifying why it is a particular hot spot (and more so that other similar mountain areas) that needs to be looked at, would be enough. [gerhard Krinner, France]	Accepted. We have removed this sub-section from the discussion, but have moved some of the content to other sections dealing with impacts in mountainous regions.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
2296	156	23	156	31	The section talks indifferently about CIMP5 (sic! Should be CMIP5) Scenarios, and gives some numbers that suggest precision, but we do not even know what scenario is talked about, nor which decade. Mentioning upward shifts of bioclimatic zones by 357 m (and ecoregion by 371 m) without error bars and any indication about the scenario and the time frame is providing useless information. [gerhard Krinner, France]	Accepted. We have removed this sub-section from the discussion, but have moved some of the content (in revised form) to other sections dealing with impacts in mountainous regions.
10546	156	24	156	24	Here, “CIMP5” should be “CMIP5”. [Hong Yang, Switzerland]	Not applicable. Text was deleted.
35386	156	24			CIMP5 - may be CMIP5? [Andrey Kalugin, Russian Federation]	Not applicable. Text was deleted.
9368	156	34	156	47	As majority of human population live in cities, a more emphasised and detalied description of impacts on urban areas may be needed with concrete data regarding socio-economic consequences of changing weather patterns. As it was mentioned in the text, some consequences are detailed, but it is not clear why these examples are published and distinguished. [Attila Buzási, Hungary]	The climate change "hot spot" discussion has been revised to focus specifically on geographical regions, and thus "urban areas" has been removed from this section. Section 3.4 deals extensively with impacts on urban areas, including socio-economic impacts and the role of extreme weather events.
35256	156	34	156	34	Following relevant study should be included in the section: extreme summer heat has become more frequent over the last 20 years across the contiguous 48 states of USA,where in western part number of events in the 2000s have been recorded. Source:US EPA 2017 [Shaukat Ali, Pakistan]	The climate change "hot spot" discussion has been revised to focus specifically on geographical regions, and thus "urban areas" has been removed from this section. In the extensive discussion of urban areas in section 3.4 we have focussed on the peer-reviewed literature, and there was no need to include the US EPA study.
60630	156	34	156	47	This section 3.5.5.12 on Urban Areas should be moved and consolidated with 3.4.5.2.2 on Cities. [United States of America]	Accepted.
46820	156	35	156	35	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not relevant - the subsection has been removed.
4320	156	36	156	39	Repeated with sentences listed above. [Gensuo JIA, China]	Not relevant - the subsection has been removed.
10548	156	40	156	45	The information was already provided between P127 L17 and P128 L3. [Hong Yang, Switzerland]	Not relevant - the subsection has been removed.
35388	156	42			Yu and Zhai - missing year of publication [Andrey Kalugin, Russian Federation]	Not applicable. Text was deleted.
17702	157		159		I think it would be better to remove or merge fourth and fifth row. Most blank in fourth and fifth row are empty or have a same sentence. [Republic of Korea]	Accepted. Fifth row was deleted and fourth row rewritten.
17812	157		159		1) AR5 WGI (FAQ10.2 Time of Emergence of human-caused warming) reported anthropogenic warming is already obvious on land in tropics in warmer season. Torpics in Table 3.7 needs to be supplemented 2) High mountain region is vulnerable region in global warming. In Alpine regions of Table 3.7, water security description of "3.5.5.3" needs to be included 3) Regarding Table 3.7, in addition to Alpine regions, results over other high altitude regions (e.g., Tibet) need to be supplemented. [Republic of Korea]	We have restricted the discussion in the table to impacts where there is literature to support clear differential impacts at 1.5 vs 2 degrees C of warming.
656	157	1	159	2	Table 3.7. should also include peatlands. [Maria Jesus Iglesias Briones, Spain]	We focus on geographical regions, that are vulnerable in terms of both physical climate change and related impacts on human and ecosystem impacts.
6368	157	1	159	1	Table 3.7 provides a good overview and can be further developed. If possible, fiill in the blanks for some of the regions/phenomena. [Anne Olhoff, Denmark]	Accepted - the table has been updated.
7878	157	1	157	2	Table 3.7: There is esssentially no difference between the 4th ("warming of 2C-3C") and the 5th ("warming of more than 3C") columns. Consider combining them into a single column titled "warming over 2C". [Petr Zavialov, Russian Federation]	We have restricted the analysis to warming of 2-3 degrees C, and not to higher levels of warming, in the final version of the Table.
17708	157	1	159	1	Please deal with terrestrial ecosystem in Asia and forest ecosystem in temperate zone. [Republic of Korea]	We have here focussed specifically on certain geographical regions that are climate change hot spots, rather than on sectors - forest ecosystem impacts are summarised in the next section on tipping points.
18504	157	1	159	1	Table 3.7 provides a good overview and can be further developed. If possible, fiill in the blanks for some of the regions/phenomena. [Andrea TILCHE, Belgium]	Accepted - the table has been updated.
32094	157	1	159	1	It is unclear how hotspots are identified. In some cases, metric of 'avoided risks' is used (e.g. SIDS). In other cases, metric of 'absolute change' is used (e.g. SE Asia) . Suggestion to review and clarify. [Jamaica]	We focus on geographical regions, that are vulnerable in terms of both physical climate change and related impacts on human and ecosystem impacts.
36426	157	1	159	1	It is unclear how hotspots are identified. In some cases, metric of 'avoided risks' is used (e.g. SIDS). In other cases, metric of 'absolute change' is used (e.g. SE Asia) . Suggestion to review and clarify. [Snaliah Mahal, Saint Lucia]	We focus on geographical regions, that are vulnerable in terms of both physical climate change and related impacts on human and ecosystem impacts.
41456	157	1	159	1	Table 3.7 will be very useful if completely populated. [Lourdes Tibig, Philippines]	Accepted and updated.
49238	157	1			It is unclear, what this table is referring to. Sometimes, it's 'avoided risks' (like for SIDS, for example). Sometimes, it's absolute change. Please review and clarify. [Bill Hare, Germany]	The table lists both changes in the physical climate system and related impacts that render certain regions to be "climate change hot spots".
308	157	2	157	2	In "Alpine Regions" row, "1.5-20 warming" column box: Should read "More severe shift on biomes." [Paul Doyle, Canada]	This correction has been made, thank you.
309	157	2	157	2	General comment on Table 3.7: Check entire table for typos and completeness of all boxes. "Empty" boxes should be filled in with either "N/A", or "N/C", or "Requires investigation" or "To be described" or some other suitable explanation. [Paul Doyle, Canada]	Accepted - the table has been carefully revised editorially, and findings have also been updated based on the updated Chapter 3 findings.
18506	157	2	157	2	Broaden cell on small islands to cover low lying islands, coasts and communities, impacts not limited to SIDS. [Andrea TILCHE, Belgium]	Rejected. This subsection focuses specifically on small islands as a hot-spot region, not on coastal areas in general.
22380	157	2			The points highlighted for Small islands in the column "Warming 1.5ºC or less" correspond to the 1.5ºC impacts when compared to 2ºC (see item 3.5.5.9. in page 155), but not to the real impact for a warming of 1.5ºC [LUIS VALDES, Spain]	Rejected. The impacts listed for warming of "1.5 degrees C or less" are exactly those listed in the peer reviewed literature for this temperature threshold.
36026	157	2			Chapter 3.1 annex, "Table S7-S3.4.7-2: Projected temperature related risks to human health" has identified heat waves to change significantly between the 1.5 and 2 degree scenarios. In Table 3.7, for Southeast Asia, there is no mention of heat waves which gives rise to high mortality over the region. This should be added in table 3.7 [India]	We have listed here only those risks where the peer-reviewed literature clearly differentiates in risks for Southeast Asia, under 1.5 vs 2 degrees C of warming.
44610	157	2	159	1	Landscape Table 3.7 [Rita Man Sze Yu, China]	Graphical designers will decide whether the Table will be presented in landscape or portrait format.
46822	157	2	157	2	Second row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted. The text has been revised to include IPCC uncertainty language and related confidence statements.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49484	157	2	157	2	Small islands row. Text indicates people at inundated in 2150 or displaced (column 2 and 3). I am guessing this is cited from Rasmussen et al. (based on p155, line42), whcih is an interesting and well thought through paper, but I have concerns over their small island projections. Rasmussen et al. projects exposure and does not include defences or adaptation. If defences are taken into account, the number of people inundated would be far less. No one has quantified this. The text is therefore wrong. Additionally, Rasmussen et al. used global-scale data for their projections from population and topographic data. There are known issues here with data in terms of data resolution and a misfit between land area and population distribution. To me, I would be very wary about these numbers as I do not think they are reliable as the methodology is questionable. However, I do not know any that are. Additionally, Rasmussen et al's numbers use 2010 population, not any projections. This needs to be made clear. Maybe a qualilatitive assessment here would be better. [Sally Brown, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks for the comment, which we have carefully considered. The eventual SR1.5 assessment and numbers stated here in terms of small impact islands are thus based on the prevailing literature and our expert assessment, and if disagreements exist with the findings these need to be addressed through future publications.
52630	157	2	157	2	Under the SIDS section of Table 3.7, what is meant by 'reduced' (i.e. reduced risk of coastal flooding of 20-80%)? Is this being measured relative to the higher scenarios? If this is a the case, it is confusing to the reader, as it would appear that under a 1.5oC scenario the risks are reduced in comparison to present day/pre-industrial. This notation has appeared throughout the text. It is felt this approach of comparing 1.5oC to 2.0oC impacts should not be mixed up with comparing 1.5oC with pre-industrial. Thus, suggest changing the word 'reduced' and the statements to reflect a comparison to present day/pre-industrial since the risks are increasing overall. [Charlotte Roehm, United States of America]	It is implicit that those reduced risks refer to risks under 1.5 degrees C of warming, vs 2 degrees C of warming, as is also evident from the text provided for each of the hot spot regions.
22382	158				• One of the points highlighted for West Africa and the Sahel reads as follows: Significant impacts in terms of avoided impacts on agriculture, which meaning puzzles me. Will it be possible to rephrase the sentence to make it more understandable? [LUIS VALDES, Spain]	Accepted. The table was revised.
46824	158	1	158	1	Third and fifth row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised into formal IPCC uncertainty language and related confidence statements.
47268	159		159		Armour et al 2009: Citation used twice with repeated statements on Page 57 and Page 159. The whole paragragh citing this reference is the same in these two sections. [Sarah Connors, France]	The text has been revised to avoid repetition, yet it should be noticed that the tipping point section consolidates text in sections 3.3 and 3.4.
16414	159	3	159	3	No Southern Ocean or Antarcic subsection in “Avoiding regional tipping points by achieving more ambitious global temperature goals”. [Australia]	The Southern Ocean and Antarctica are not discussed in this section on "regional tipping points", but rather in Section 3.5.2 under RFC5 on "global singular events".
50594	159	3	159	15	I don't really understand the distinction betwee regional and global tipping points. The global tipping elements mentioned in Box 3.5 are also located in particular regions (Arctic, Sahel, Tibet, …), and some (if not all) of the regional tipping elements mentioned here could have global-scale implications when tipped (monsoon disruption, carbon release from permafrost, sea ice). [Jacob Schewe, Germany]	Box 3.5 has been removed to avoid repetition. We distinguish in the chapter between large-scale singular events, such as the melting of the Greenland or West Antarctic ice sheets (section 3.5.2) vs tipping points in regional systems (e.g. section 3.5.5).
55664	159	3	163	2	The disucssion on avoidiung tipping points by acheiveing more ambitous global temperature goals shoudl be linked to the issue in Chapter 2 on permanance. Thus there is potential for virtuous circle: rapid net GHG reductions, with Ecosystem-based approaches (mature CDR measure) playing a significant role, especially in early stages, limiting temperature increase, thereby increasing ecosystem resilience and permanence. (Contrast with viscous circle of weak mitigation, temp exceeding threhsolds, ecosystem breakdown contriuting to further (possibly runaway) climate change). [David Cooper, Canada]	Thank you for raising this interesting and valid point. The focus of focus of SR1.5, however, is on impacts under 1.5 vs 2 degrees C of warming. The Chapter 3 ES and also the SPM of Chapter 3 clearly point out the significant benefits of high mitigation.
60632	159	3	162	21	Much if not all of the material covered in 3.5.6 seems to have already been covered in earlier parts of the chapter. 3.5.6.1 on Arctic sea ice stands out as especially redundant. Suggest considering deleting entire section or retaining appropriate pieces of text and incorporating into other sections of the chapter. [United States of America]	The section has been refined to avoid repetition as far as is practical, with a focus on consolidation Section 3.3 and Section 3.4 material with through the lens of regional tipping points.
60634	159	3	159	3	The heading for subsection 3.5.6 (if it remains) should be edited to simply read "Regional tipping points" [United States of America]	Rejected. It is useful to add to the heading, that the tipping points are discussed as a function of global temperature goals.
61932	159	3	159	3	The title of this section looks extremely prescriptive. There is strong overalp with the box on tipping points, looking at the same aspects, and a lot of repetition with the AR5 and with the earlier sections which also looked at these issues. The understanding of "tipping point" here is extremely vague as the text also covers heat waves (why would this be linked to a tipping point?). I suggest to improve the framing of the section and possibly only to have the related box, not the full text. The notion of "regional tipping point" should be introduced explicitely (it is used in Table 3.8). Again, we need strigent traceability between the key findings of Table 3.8 and the assessed literature, so that the sections of text or boxes should be closely linked to Table 3.8. We need to see use of the calibrated IPCC language, not vague terms ("is plausible"), italicized. [Valérie Masson-Delmotte, France]	The Box on tipping points has been removed, to avoid repetition. Heat-waves are still discussed, since unprecedented heat-wave occurrences may result in tipping points being exceeded in terms of human health impacts. The section has been updated in terms of findings and the use of IPCC uncertainty language. Tipping points are clearly defined in the introduction paragraph of section 3.5.5.
10024	159	5	159	15	Tipping point sensitivity is not well studies or understood. The implications of temperature going above 1.5C and then coming down to 1.5C are not clear. [Saudi Arabia]	Rejected. For a variety of regional systems, there is a substantial amount of literature available on the potential existence of tipping points. Here we provide an assessment of that literature, using IPCC confidence language to given an indication of the confidence levels in the assessment.
34132	159	18	159	34	3.5.6.1 Arctic sea-ice: There seems to be repetition here regarding Arctic sea ice and the role of possible tipping points relative to section 3.3.9, page 57 (lines 33-41). Parts of the text are identical. [Norway]	We have revised the text to avoid repetition, but it should be noted that Arctic sea-ice needs to be discussed in terms of a hot-spot region (range of impacts) and also in terms of potentially representing a regional "tipping point".
34134	159	18	159	18	Please spell sea ice without “-“. [Norway]	Editorial - copyedit to be completed prior to publication
34136	159	18	159	34	3.5.6.1 Arctic sea-ice: In the discussion about Arctic sea ice and tipping points, we wonder if the aspect of tipping points related to the drivers of Arctic sea ice growth and decay, oceanic and atmospheric conditions and processes was visited and could be mentioned. [Norway]	For the process-based discussion around Arctic sea-ice, please see section 3.3. Here we focus on the discussion of the existence of a tipping point in ice extent and concentration.
22384	159	19		34	I find this a bit repetitive. Perhaps if the text is condensed in three or four lines and remit the reader to other subsections (e.g. Box 3.5, which has almost the same title "Tipping points"). [LUIS VALDES, Spain]	The text has been revised to avoid repetition and Box 3.5 has been removed.
43042	159	19	159	34	Inconsistent with the tipping point definition in Box 3.5. [Durwood Zaelke, United States of America]	Box 3.5 has been removed to avoid repetition.
16416	159	24	159	24	To be consistent with the hyphenation of sea ice in this chapter change “sea ice extent” to read “sea-ice extent”. [Australia]	Editorial - copyedit to be completed prior to publication
45988	159	24	159	24	Summer is "summer" with small letter. [Hiroyuki ENOMOTO, Japan]	Accepted. Text was revised with the suggested edit
45990	159	24	159	31	There seems to be discussions on possible ice free and recovery of Arctic sea ice, related irreversible ice loss and tipping point. Consider explanation on current conclusion of physical recovery and ecological irrevesible conitions (Chap.1, 3 and/or SPM). [Hiroyuki ENOMOTO, Japan]	The assessment around Antarctic sea-ice is summarised in the ES and SPM of Chapter 3.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
46826	159	28	159	31	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised and rewritten in terms of IPCC uncertainty language and confidence statements.
62714	159	28	159	28	this is one of several assessment statements that are inappopriate in my view. The word 'rapid' is not quantitatively defined in this section and so it is impossible to know what the calibrated term 'likely' means in this context. Calibrated confidence terminology can only be appropriately used when the statement is definite and specific. [Greg FLATO, Canada]	The text has been revised and the word "rapid" is avoided in the updated text.
2298	159	29	159	32	This repeats information given before. [gerhard Krinner, France]	Accepted. Section was revised.
8874	159	31	159	31	to be mainatained in' should be 'to be maintained in' [Robert Shapiro, United States of America]	Not applicable. Section was revised.
36028	159	31	159	32	Year in references needs to be added [India]	Not applicable. Section was revised.
45992	159	31	159	32	fill references [Hiroyuki ENOMOTO, Japan]	Not applicable. Section was revised.
2300	159	37	160	6	It is not made clear why shrub or tree establishment in tundra areas could be a tipping point. There needs to be a climatic feedback for a tipping point to operate. [gerhard Krinner, France]	Rejected. In this case a tipping point exists where the number of days below 0 degrees C decreases to such an extent (and in association with permafrost degradation) that abrupt increases in tree cover in the tundra can take place. This potential for abrupt change represents the tipping point, and although there may be climatic feedback, existence of the tipping point does not depend on that.
9396	159	37	160	6	Note there are importatnt interactions between potential increase in tundra shrub growth, snow cover and permafrost conditions. Shrubs can catch snow and this can lead to thicker snow cover and warmer winter ground conditions and therefore warming of permafrost (see for eg. Lantz TC, Marsh P, Kokelj SV (2013) Recent shrub proliferation in the Mackenzie Delta uplands and microclimatic implications. Ecosystems 16:47-59. doi:10.1007/s10021-012-9595-2). Also fires can result in ground warming and permafrost thaw (see for eg. Smith SL, Riseborough DW, Bonnaventure PP (2015c) Eighteen year record of forest fire effects on ground thermal regimes and permafrost in the central Mackenzie Valley, NWT, Canada. Permafrost and Periglacial Processes 26 (4):289-303. doi:10.1002/ppp.1849; Zhang, Y., Wolfe, S. A., Morse, P. D., Olthof, I., & Fraser, R. H. (2015). Spatiotemporal impacts of wildfire and climate warming on permafrost across a subarctic region, Canada. Journal of Geophysical Research: Earth Surface, 120, 2338–2356. http://doi.org/10.1002/2014JF003432. Fisher JP, Estop-Aragones C, Thierry A, Charman DJ, Wolfe SA, Hartley IP, Murton JB, Williams M, Phoenix GK (2016) The influence of vegetation and soil characteristics on active-layer thickness of permafrost soils in boreal forest. Global Change Biology 22:3127-3140. doi:10.1111/gcb.13248 [Sharon Smith, Canada]	Thank you for these references. We have extended the text in section 3.4 and in this section to elaborate further on permafrost-fire-shrub-tree dynamics in the tundra. However, note that the purpose of SR1.5 is to assess on risks under 1.5 vs 2 degrees C of warming, which implies a very specific focus on the references selected and final form of the text.
34138	159	37	160	24	3.5.6.2 Tundra and 3.5.6.3 Permafrost: Adding content and references that mention also the other organism groups inhabiting tundra would benefit this subsections. Mammals, birds, invertebrates, and their interactions with vegetation as well as relationships with the abiotic system can be as dependent or even more tightly linked to climate change than that of vegetation (trees). A thorough summary can be found in ABA Terrestrial ecosystems chapter and references therein. Please consider balancing the text accordingly. [Norway]	Thank you for the comment, which we agree with. However, the discussion in these sections deals specifically with tipping points in the tundra (vegetation fraction) and with permafrost degradation.
310	159	38	159	38	.....strongly dependent on the number..... [Paul Doyle, Canada]	Accepted. Text was revised.
8876	159	38	159	38	constrained the number' should be 'constrained by the number' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
12150	159	38	160	6	Be more specific about the nature of the tipping point - at warming greater than 2 degrees, XX will occur… [United Kingdom (of Great Britain and Northern Ireland)]	Please see Table 3.7 for a summary of risks as per different levels of global warming.
311	159	39	159	39	.....tipping point exists when the number of days below 00 C decreases to the extent that the tree..... [Paul Doyle, Canada]	Thank you - annotation was corrected.
8878	159	39	159	39	that tree fraction' should be 'that the tree fraction' [Robert Shapiro, United States of America]	Rejected. The text reads well with "tree fraction" rather than "the tree fraction".
658	160	3	160	24	I will repeat myself here again, when talking about C storage implications in tundra and permafrost due to warming, peatlands should be mentioned specifically. [Maria Jesus Iglesias Briones, Spain]	Peatlands are discussed extensively in sections 3.4.3.4 and 3.4.3.5, but here the focus is on accumulated risks to permafrost under 1.5 vs 2 degrees C of global warming.
8880	160	4	160	4	different degees of' should be 'different degrees of' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
35258	160	4	160	4	The spelling of degrees is written incorrect. [Shaukat Ali, Pakistan]	Accepted. Text was revised with the suggested edit
45638	160	9			I suggest including the study of Schuster et al. (2018) about mercury content in permafrost soils, which would release from melting permafrost soils. They stated that "Northern Hemisphere permafrost soils contain nearly twice as much Hg as all other soils, the ocean, and the atmosphere combined, indicating a need to reevaluate the role of the Arctic regions in the global Hg cycle. This Hg is vulnerable to release as permafrost thaws over the next century. They estimated that soils in permafrost regions contain an estimated 1,656 ± 962 Gg Hg, of which half or 793 ± 461 Gg Hg is frozen in permafrost." [Adela M Sánchez-Moreiras, Spain]	Thank you for the comment. In this section we focus on tipping points in the context of permafrost degradation, however.
50672	160	9	160	22	We would like to draw the attention of the Chapter Lead Authors and Lead Authors to the paper by Comyn-Platt et al., "Permafrost and natural methane feedbacks limit emission budgets to 1.5 or 2.0°C of warming", which is in review for publication in Nature Geosciences. Copies of the submitted paper were provided to Tania Guillén, Chapter 3 Scientist. In our paper, we extend the permafrost thaw modelling of Burke et al. (2017, cited paper in draft) by allowing for some of the carbon to be released as methane. We also take account of methane (CH4) emissions from natural wetlands and implement updated descriptions of these processes into the JULES global land surface model. Uniquely, we use JULES within a novel inverted version of the IMOGEN intermediate complexity climate model (Huntingford et al., IMOGEN: an intermediate complexity model to evaluate terrestrial impacts of a changing climate. Geoscientific Model Development 3, 679-687, doi:10.5194/gmd-3-679-2010) to follow prescribed global warming pathways that stabilise at 1.5°C or 2.0°C above pre-industrial levels by year 2100. By 2100, the IMOGEN ensemble of 34 CMIP5 models estimates a median 126 Mha loss of permafrost area at 3m depth for the 1.5°C asymptote pathway and an additional 102 Mha loss for the 2.0°C pathway. Between 20 and 30 % of the soil carbon in this thawed permafrost has been released to the atmosphere by 2100 and will cause a reduction of the anthropogenic emissions budget. The differences in the areas of permafrost loss between scenarios appear less than previous estimates (e.g., cited paper by Chadburn et al., 2017), because our simulations represent a transient snapshot at 2100 and not an equilibrium condition, which will not be met for several centuries. [Garry Hayman, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for pointing out this important publication. Unfortunately its findings in accepted form became available too late to be included in SR1.5.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
52632	160	9	160	24	Permafrost loss will not only result in a potential increase in GHG released to the atmosphere (+ve feedback) but also in the redistribution of C and energy across the landscape. This has large implications for freshwater and coastal ecosystems. How is this accounted for in relation to the other sectors? While it is appreciated that the scope of each chapter is restricted, there is a sense that impacts on ecosystems are discussed separately, yet the impacts across systems is not discussed in much detail. This cross-system impact is not only cumulative in nature, but also potentially exponential and non-linear (as discussed at the beginning of the Chapter). As such how much accounting is made for the 'transfer' of impact outcomes between systems? [Charlotte Roehm, United States of America]	Many thanks for this comment. This section deals specifically with tipping points in the permafrost system. For a more comprehensive discussion of changes in permafrost ecosystems, see section 3.4.
9398	160	11	160	11	Same comment as earlier comment. Poor terminology used here - "....extent of near-surface permafrost shrinking"??? This makes no sense given permafrost has considerable thickness (would you refer to near-surface glacier shrinking?). The models on which this is based essentially consider deepening of thaw (up to 3 m) [Sharon Smith, Canada]	We have revised the text and now avoid usage of the terminology "near-surface permafrost shrinking"
9400	160	11	160	14	Be clear that this loss of permafrost is a committed loss (i.e. refers to equilibrium conditions) [Sharon Smith, Canada]	The text makes it clear that the loss is irreversible, but equilibrium conditions are not necessarily implied, considering, for example, of a "business as usual" scenario.
22386	160	13			insert space between "respectively(Chadburn" [LUIS VALDES, Spain]	Not applicable. Section was revised.
55796	160	14			Again result wrongly quoted. Should be 2 x 10^6 km^2 rather than 4 x 10^6 km^2 [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for the comment. The section has been revised accordingly.
55798	160	15			Add reference: Hugelius et al., 2014; full citation is given in Chapter 2. [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The focus of this section is on potential tipping points in terms of permafrost degradation.
8882	160	17	160	17	further gloibal warming' should be 'further global warming' [Robert Shapiro, United States of America]	Not applicable. Section was revised.
10026	160	17	160	17	Typo “global”…”global” [Saudi Arabia]	Not applicable. Section was revised.
22388	160	17			replace "gloibal" by "global" [LUIS VALDES, Spain]	Not applicable. Section was revised.
36030	160	17			Replace "gloibal" with 'global; [India]	Not applicable. Section was revised.
55800	160	18	160	20	More recent estimates given in: Burke et al 2018, citation given in cell I18, above. I’m not sure what Burke et al 2006 refers to as I can’t find it in the reference list [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for pointing out this typo - indeed the correct reference is Burke et al. (2017). We also refer to the mentioned study of Koben et al. (2015) in Section 3.4.
2302	160	20	160	20	What reference is Burke et al. 2006? Is that meant to be their 2017 Biogeosciences paper? I cannot find these numbers. There are several other studies which provide that kind of numbers (e.g. Koven et al., Phil Trans Roy Soc A, 2015), so it should be made clear that this paper is only an example. [gerhard Krinner, France]	Thank you for pointing out this typo - indeed the correct reference is Burke et al. (2017). We also refer to the mentioned study of Koben et al. (2015) in Section 3.4.
47294	160	20	160	20	Burke 2006 is missing from the reference list. [Sarah Connors, France]	Many thanks for pointing this out - the correct reference is Burke et al. (2017).
22390	160	22			insert space between "irreversible(Collins" [LUIS VALDES, Spain]	Accepted. Text was revised with the suggested edit
8036	160	27	160	42	Zhang et al. (2017) investigated changes in exposure to extreme precipitation (i.e., maximum accumulated 5-day precipitation, RX5day, as a proxy for potential flooding risks) at different warming levels over the populous global land monsoon (GM) region, based on multimodel projections under Representative Concentration Pathway (RCP) 8.5 in the fifth phase of the Coupled Model Intercomparison Project (CMIP5). Over the GM region, the avoided impacts by the 0.5°C less warming amount to 118% (57%-140% for the 25th-75th percentile) and 115% (29%-178%) for area and population exposures to 4? exceedance events, respectively. The increases in exposure to the upper tail extremes are related to increases in both the mean state and the variability of extreme precipitation with warming. Among sub-monsoon regions, South Africa is a primary hotspot, followed by South Asia, East Asia, and South America. Details are referred to: Zhang W. et al. 2017: Reduced exposure to extreme precipitation by 0.5°C less warming for global land monsoon regions. Nature Communication, under review [Tianjun Zhou, China]	Thank you for pointing out this important paper. Unfortunately it became available too late in accepted form, for its findings to be included in SR1.5.
16418	160	27	160	42	This discussion should make clear and start with the fact that major shifts (e.g. collapse of) in the Asian monsoon are not expected for 1.5 or 2C warming based on existing literature. [Australia]	The revised text makes it clear that there is low confidence regarding changes in monsoons under 1.5 vs 2 degrees of global warming, as well as regarding the differences between responses at 1.5°C versus 2°C levels of global warming."
17698	160	27	160	42	Change in Precipitation patterns, onset, duration time of monsoon as a result of climate change varies from region to region even in the Asia, as explained in the IPCC AR5. Therefore, we recommend that you add more explanation about East Asian monsoon due to results of papers listed up in the “4”, and “5” comment. [Republic of Korea]	We agree that regional differences exist in how the monsoon may respond to different levels of global warming across Asia. However, in this section the focus is entirely on investigating potential tipping points in the larger system under 1.5 vs 2 degrees C of warming.
7662	160	28	160	42	Cuurent research points to different changes in the Asian Monsoon with current warming, so how likely is the projection of increased monsoons in a fiture 1.5 C world? See papers by Roxy et al. (2017, Nature Communications) and others, there seems an increase in extremes rains, but overall decline in the mean with warming potentially duet to aerosol effects [Jens Zinke, Germany]	See sections 3.3.3.1 and 3.3.3.2 for a more extensive discussion of observed and projected changes in the monsoon (this section deals exclusively with tipping points). Overall, our assessment is that there is low confidence regarding observed trends in precipitation in monsoon regions, and there is low confidence regarding changes in monsoons under 1.5 vs 2 degrees C of global warming levels, as well as regarding differences in monsoon responses at 1.5°C versus 2°C.
11068	160	28	160	34	Asian monsoon - Although the Asian monsoon is only a tiny part of the report, I am surprised that there aren't any specific references (Lenton et al, 2008, is on tipping points) used. Also none of the more recent studies on the projected changes in the Asian monsoon (even at certain levels of global warming) are considered. Maybe the recently accepted study by Chevuturi et al. ("Projected changes in the Asian-Australian monsoon region to 1.5 C and 2.0 C global-warming scenarios") in Earth's Future didn't fulfill the cut-off ctriterion, but there are other relevant studies, which have been published more recently, around. The references in Chevuturi et al. might be very usfeul in this respect. [Wilhelm May, Denmark]	Please sections 3.3.3.1 and 3.3.3.2, for a more extensive list of recent references, all indicating low confidence in projected changes under 1.5 vs 2 degrees C of global warming. The section on tipping points does not attempt to repeat the section 3.3 discussion, but concisely summarizes the main findings in terms of tipping points.
43616	160	28	160	42	Similarly to impacts of permafrost melting on ecosystem and human society in the content in 3.5.6.3, we have to note that changes in Asian monsoon can make impacts on phenology and its related to carbon balance. (e.g., Hong and Kim, 2011: Impact of the Asian monsoon climate on ecosystem carbon and water exchanges: A wavelet analysis and its ecosystem modeling implication, Global Change Biology, 17, 1900-1916). [Jinkyu Hong, Republic of Korea]	Many thanks for the comment, however, this section deals with the possibility of a tipping point existing in the monsoon as an atmospheric circulation system.
54294	160	28	160	29	Useful to clarify that it's the atmospheric pressure gradient. [John Caesar, United Kingdom (of Great Britain and Northern Ireland)]	That is implicit, given that the monsoon is an atmospheric circulation system.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
1020	160	29	160	30	Says “As land masses warm faster than the oceans, a general strengthening of this gradient, and hence monsoons, may be expected (Lenton et al., 2008)”. This statement is based on a decade old study. Several recent studies using long-term observed records demonstrate a statistically significant weakening of the monsoon circulation and a decline in the monsoon rainfall over central India (e.g. Roxy et al. 2015). These studies show that unlike the other regions, the Indian Ocean is warming faster than the Indian landmass. This contradicts the statement made in the draft SR 15 document. Reference: Roxy M. K., K. Ritika, P. Terray, R. Murutugudde, K. Ashok and B. N. Goswami, 2015: Drying of Indian subcontinent by rapid Indian Ocean warming and a weakening land-sea thermal gradient. Nature Communications, 6:7423. [Roxy Mathew KOLL, India]	The study by Lenton et al. (2008) is used to present the general theories that relate to tipping points in monsoon systems in general, namely that as land masses warm faster than the ocean a general strengthening of monsoons may be expected under global warming, as well as related impacts of albedo. This general expectation (strengthening of monsoons in general) was upheld by the AR5 assessment (see section 3.3.3.2 for some of the most recent references). However, here we restrict the discussion to investigate potential tipping points at 1.5 vs 2 degrees C of global warming. Our assessment is for low confidence in observed trends in monsoon precipitation, and low confidence in projected changes under 1.5 and 2 degrees C of warming. That is, our assessment does not argue for either a strengthening or weakening of monsoons under 1.5 vs 2 degrees C of global warming, and for higher levels of warming we maintained the AR5 assessment, which will be carefully re-assessed in through AR6.
36032	160	29	160	30	Lines 29-30 on Asian Monsoon says “As land masses warm faster than the oceans, a general strengthening of this gradient, and hence monsoons, may be expected (Lenton et al., 2008)”. This statement is based on a decade old study. Several recent studies using long-term observed records demonstrate a statistically significant weakening of the monsoon circulation and a decline in the monsoon rainfall over central India (e.g. Roxy et al. 2015, Krishnan et al. 2016). These studies show that unlike the other regions, the Indian Ocean is warming faster than the Indian landmass. This contradicts the statement made in the draft SR 1.5 document. Marine phytoplankton sustains the aquatic food web, drives the marine ecosystem, and constrains the global fisheries catch. In addition, the phytoplankton absorbs the solar radiation and modulates the upper ocean heat flux, thereby influencing climate processes and biogeochemical cycles, particularly the carbon cycle.However, there is little discussion on the impact of climate change on marine phytoplankton concentrations in the global oceans. There should be a sub-section on this in the SR 1.5. [India]	The study by Lenton et al. (2008) is used to present the general theories that relate to tipping points in monsoon systems in general, namely that as land masses warm faster than the ocean a general strengthening of monsoons may be expected under global warming, as well as related impacts of albedo. This general expectation (strengthening of monsoons in general) was upheld by the AR5 assessment (see section 3.3.3.2 for some of the most recent references). However, here we restrict the discussion to investigate potential tipping points at 1.5 vs 2 degrees C of global warming. Our assessment is for low confidence in observed trends in monsoon precipitation, and low confidence in projected changes under 1.5 and 2 degrees C of warming. Section 3.4 deals extensively with climate change impacts on phytoplankton, but in terms of feedbacks, our assessment has not found literature relevant to impacts under 1.5 vs 2 degrees C of global warming.
22392	160	31			replace "be" by "by" [LUIS VALDES, Spain]	Accepted. Text was revised with the suggested edit
8884	160	35	160	35	emission scenarions are' should be 'emission scenarios are' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
22394	160	35			replace scenarions" by "scenarios" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
22396	160	42			replace "gloal" by "global" [LUIS VALDES, Spain]	Accepted. Text was revised with the suggested edit
50596	160	45	161	7	GCM projections of Sahel rainfall diverge (e.g. Biasutti, 2013, 10.1002/jgrd.50206). In Schewe & Levermann (2017, 10.5194/esd-8-495-2017) we show that while many GCMs simulate just small, gradual changes in central Sahel mean rainfall, a few models project a strong and fairly abrupt intensification, that could be understood in terms of non-linear monsoon dynamics. In these models, the monsoon "tipping" happens near the 1.5-2.0°C warming range. I think this would be worth mentioning here, since this tipping point would be at much lower temperatures than the earlier 3°C estimate. [Jacob Schewe, Germany]	Our assessment is that projected future Sahel rainfall is uncertain, and that is the main message from the section, as well as from Section 3.3.
22398	160	47			replace "Saharah" by "Sahara" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
22400	160	48			insert space between "2014)al" [LUIS VALDES, Spain]	Accepted. Text was revised with the suggested edit
22402	160	50			insert space between "futures.Sylla" [LUIS VALDES, Spain]	Not applicable. Section was revised.
17842	161				Just rain and boreal forest is explained. Temperate forest should be also explained./Moon, J., Lee, W.K., Song, C., Lee, S.G., Heo, S.B., Shvidenko, A., Kraxner, F., Lamchin, M., Lee, E.J., Zhu, Y., Kim, D., Cui, G. 2017. An introduction to Mid-Latitude ecotone: Sustainability and environmental challenges. Sib. J. For. Sci. N. 6:41-53./Kim, M., Lee, W.K., Kurz, W., Kwak, D.A., Morken, S., Smyth, C.E., Ryu, D. 2016. Estimating carbon dynamics in forest carbon pools under IPCC standards in South Korea using CBM-CFS3. iForest-Biogeosciences and Forestry 10(1):83./Kim, M., Lee, W., Choi, G.M., Song, C., Lim, C.H., Moon, J., Piao, D., Kraxner. F., Shividenko, A., Forsell, N. 2017. Modeling stand-level mortality based on maximum stem number and seasonal temperature. Forst Ecology and Management 386:37-50./Byun, J.G., Lee, W.K., Kim, M., Kwak, D.A., Kwak, H., Park, T., Byun, W.H., Son, Y., Choi, J.K., Lee, Y.J., Saborowski, J., Chung, D.J., Jung, J.H. 2013. Radial growth response of Pinus densiflora and Quercus spp. to topographic and climatic factors in South Korea. Journal of Plant Ecology 6(5):380-392. [Republic of Korea]	Many thanks for the reference. However, our assessment is that the main risks for tipping points are in the tropical and boreal forests, hence the focus on these biomes in the tipping point section.
22404	161	7			insert space between "futures(Engel" [LUIS VALDES, Spain]	Accepted. Space was inserted.
22406	161	7			add "year" in citation or delete the reference [LUIS VALDES, Spain]	Accepted. Reference added.
24242	161	7	161	7	futures(Engelbrecht et al, adjacency [Nazan AN, Turkey]	Accepted. Space was inserted.
8886	161	12	161	12	El Niño envents bringing' should be 'El Niño events bringing' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication
22408	161	12			replace "envents" by "events" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
8888	161	13	161	13	as well asincreased impact' should be 'as well as increased impact' [Robert Shapiro, United States of America]	Accepted. Text was revised.
35260	161	13	161	13	The spacing is missing between words "asincreased" [Shaukat Ali, Pakistan]	Accepted. Text was revised.
8890	161	14	161	14	trigger to a critical threshold' should be 'trigger a critical threshold' [Robert Shapiro, United States of America]	Accepted. Text was revised.
22410	161	15			A comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Accepted. Comma was added.
22412	161	17			Check and correct spelling "savanna" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
10452	161	21	161	30	Please see et al. 2016 for a recent assessment of the literature on boreal tipping points and multiple stable states. it includes some further references not mentionedn here. Schaphoff S, CPO Reyer, D Schepaschenko, D Gerten, A Shvidenko (2016) Observed and projected climate change impacts on Russia’s forests and its carbon balance. Forest Ecology and Management 361:432-444. DOI: 10.1016/j.foreco.2015.11.043 [Christopher Reyer, Germany]	Many thanks for the reference. However, our focus here is largely on potential tipping points under 1.5 vs 2 degrees C of warming.
46828	161	21	161	21	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised and is now in formal IPCC uncertainty language with associated confidence statements.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
62302	161	21	161	26	Rather duplicating the sentences (cf. page 83, line 10-16), suggesting the detailed tipping point or describing the limitations for suggestion might be proper. [Go Eun Park, Republic of Korea]	We have revised the text to reflect the level of confidence in the assessment made.
52634	161	22	161	23	Suggested change: "Dynamic vegetation models and coupled climate models predict a northward expansion of the treeline and enhanced carbon storage features (Ciais et al., 2013a; Jones et al., 2010)." [Charlotte Roehm, United States of America]	Section was revised.
312	161	24	161	24	.....pests and heat-related mortality..... [Paul Doyle, Canada]	Editorial - copyedit to be completed prior to publication
22414	161	24			insert space between "forest(Gauthier" [LUIS VALDES, Spain]	Accepted. Space was inserted.
9402	161	25	161	26	References could be included here regarding statements on implications of thawing permafrost and waterlogging - for eg. Sniderhan, A. E., & Baltzer, J. L. (2016). Growth dynamics of black spruce (Picea mariana) in a rapidly thawing discontinuous permafrost peatland. Journal of Geophysical Research: Biogeosciences, 121(12), 2988–3000. http://doi.org/10.1002/2016JG003528 [Sharon Smith, Canada]	Thank you for the reference. However, the focus of this section is to explore tipping points in the boreal forests under 1.5 vs 2 degrees C of global warming.
22416	161	28			add symbol for degrees, 3ºC [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
24244	161	28	161	28	3C" missing degree sign [Nazan AN, Turkey]	Editorial - copyedit to be completed prior to publication
44614	161	28	161	28	thought to exist at about 3C of global warming [Rita Man Sze Yu, China]	Section was revised.
52636	161	33	161	46	How do we account for the movement of people into urban areas that is forecasted for the future (with up to 70% living in urban areas)? This combined with the increase in heat-related deaths may push the numbers exponentially. [Charlotte Roehm, United States of America]	Please see section 3.4 for a more detailed discussion of the role of urbanisation in terms of altering risks and vulnerabilities to human health, including heat stress. This section in revised form also assesses that heat waves and additional urban heat island effects could lead to a substantial increase in the occurrence of heat related mortality in cities.
4308	161	34	161	46	The main contents in this paragraph was repeated at least three times in the report. Please cross check and avoid overlap and duplication. [Gensuo JIA, China]	The text has been revised and repetitions are largely avoided.
17176	161	34	161	34	For the same reason as #2 above, the word "linearly" should be replaced with "monotonously." [Yasushi Honda, Japan]	We prefer the term linear, since the described relationships are not only monotonous, but in fact close to linear.
12152	161	34	161	46	This section is speculative and needs to be more focused with respect to tipping points and the evidence. You say there isn't a tipping point with respect to ambient (average??) temperatures, fine. But then you speculate about the possible existence of tipping points regarding heatwaves - so is there *evidence* for a non-linearity in intensity, frequency or duration of heatwaves between 1.5 and 2 degrees? And if so, is there *evidence* that this has a similarly non-linear effect on human health (e.g. number of hospitalisations, number of heat-related detahs)? If you can't be more precise, remove the section or at least heavily caveat it. [United Kingdom (of Great Britain and Northern Ireland)]	The section in revised form, based on the latest peer-reviewed papers, assesses that there is medium confidence of a tipping point existing in terms of the scale of heat-wave impacts. However, we also point out clearly that such tipping points may be avoided through suitable adaptation measures.
22418	161	34			replace "isn't" (informal when writting) by "is not" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
44612	161	34	161	34	and deaths (so there isn't a tipping [Rita Man Sze Yu, China]	unclear what this comment refers to
46064	161	34	161	35	The work of Loughnan and Nichols (2014?) do suggest a tipping point and non-linearity, differing for different cities. [Justin Oogjes, Australia]	Many thanks for this comment. The revised text is clear that local/regional tipping points may exist, not because of a non-linear temperature-health or temperature-mortality relationship, but because of coping strategies not being in place.
17178	161	37	161	40	Dang et al. Am J Pub Health 2017 would be a good addition for the discussion of heat-island effect. [Yasushi Honda, Japan]	Many thanks for the suggested reference, however this paper focuses largely on the potential for the occurrence of tipping points, or avoiding tipping points, under 1.5 vs 2 degrees C of global warming.
46830	161	41	161	41	Second row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The text has been revised and is now in formal IPCC uncertainty language with associated confidence statements.
12154	161	44	161	46	Irrelevant to tipping points, remove this sentence [United Kingdom (of Great Britain and Northern Ireland)]	The text has been largely revised.
6370	162	1	162	13	Please clarify whether these projections take adaptation into account or not. [Anne Olhoff, Denmark]	The assessment in the section is largely based on projected impacts through droughts and extreme temperatures impacting on dryland agriculture, with these impacts occurring at spatial scales so large that there are no defensible adaptation actions that can currently be foreseen.
12156	162	1	162	13	If these are all incremental changes and not tipping points, then remove the section especially as the information appears multiple times earlier in the chapter. This will help with making the chapter shorter and less dense. [United Kingdom (of Great Britain and Northern Ireland)]	Rejected. The sub-section provides important information on the existence of tipping points in crop yield.
18508	162	1	162	13	Please clarify whether these projections take adaptation into account or not. [Andrea TILCHE, Belgium]	The assessment in the section is largely based on projected impacts through droughts and extreme temperatures impacting on dryland agriculture, with these impacts occurring at spatial scales so large that there are no defensible adaptation actions that can currently be foreseen.
43618	162	1	162	13	There are the similar findings in rice paddy crop yield. Kim et al., 2003; Seasonal changes in the effects of elevated CO2 on rice at three levels of nitrogen supply: a free air CO2enrichment (FACE) experiment, Global Change Biology, 9, 826-837 Kim et al., 2013; Impacts of climate change on paddy rice yield in a temperate climate, Global Change Biology, 19, 548-562 [Jinkyu Hong, Republic of Korea]	Many thanks for the reference - we are referring to the findings of Kim et al. (2013) in Section 3.4.
114	162	4	162	4	Again, the literature is Iizumi et al. (2017), but not Lizumi et al. (2017). [Toshichika Iizumi, Japan]	Accepted. Authors name is corrected.
2220	162	4	162	4	Lizumi' should be 'Iizumi' [Akihiko Ito, Japan]	Accepted. Authors name is corrected.
22420	162	4			A comma must be inserted in between of the authors names and the year of publication (four cases in this line) [LUIS VALDES, Spain]	Accepted. Comma was added.
22422	162	6			insert space between "rainfall(Lana" [LUIS VALDES, Spain]	Accepted. Space was inserted.
12158	162	10	162	10	Should say 'further losses to yields/reduced yields' not 'yields loss and damage'. [United Kingdom (of Great Britain and Northern Ireland)]	Thanks for the comment, we have changed the wording accordingly.
52638	162	10	162	11	In this context, how do we discuss loss of yield vs ability to maintain yield sustainably? While yields may be maintained, the impacts on the ecosystem as a whole and other sectors may be much larger. [Charlotte Roehm, United States of America]	This is yet another complexity - agreed - but here we are limiting the discussion to the potential existence of tipping points in crop yield under different degrees of global warming.
8892	162	18	162	18	inceased heat-stress' should be 'increased heat-stress' [Robert Shapiro, United States of America]	Editorial - copyedit to be completed prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
313	162	19	162	19	....is likely to exceed..... [Paul Doyle, Canada]	Accepted. Text was revised with the suggested edit
8894	162	19	162	19	likely exceed' should be 'likely to exceed' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
46832	162	19	162	19	Third and fifth row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	We have revised the table in terms of the use of IPCC uncertainty language and related tipping points.
22424	162	20			insert space between "animals(Lallo" [LUIS VALDES, Spain]	Accepted. Space was inserted.
8896	162	21	162	21	subtropical regionsmore generally' should be 'subtropical regions more generally' [Robert Shapiro, United States of America]	Accepted. Text was revised with the suggested edit
22426	162	21			insert space between "regions.more" [LUIS VALDES, Spain]	Accepted. Space was inserted.
9404	162	24	162	24	Table 3.8 -- for permafrost section - be clear these are committed (or equilibrium) responses [Sharon Smith, Canada]	Thank you for the comment - the table states clearly that these losses of stored carbon are irreversible.
22428	162	24			• Permafrost: please correct 4 x 106 by 4 x10^6 (as in line 14, page 160) [LUIS VALDES, Spain]	Thank you, this change has been implemented.
24246	162	24	162	24	Table 3.8" visual inconsistency of caption and table [Nazan AN, Turkey]	Rejected. The Table caption suitably describes the table content.
55802	162	24			Filling in missing boxes for permafrost section of table, from Chadburn et al 2017 data: Percentage reduction in permafrost for 3 degree world: 43-80%. For 4 degree world: 53-100%. Again result wrongly quoted in the '1.5C or less' column. Should be 2 x 10^6 km^2 rather than 4 x 10^6 km^2. Also, it may be possible to estimate carbon emissions under higher warming scenarios from data in Burke et al (2017) (reference already in this chapter), Figure 6b. [Sarah Chadburn, United Kingdom (of Great Britain and Northern Ireland)]	Many thanks for the references - both the studies of Chadburn et al. (2017) and Burke et al. (2017) are now used extensively in the text. The table statistics have been corrected.
36034	162	25			More citations are required to substantiate the statement - 'Arctic becomes nearly sea ice free in September'. [India]	See section 3.5.4.1 and section 3.3 for an extensive set of peer-reviewed papers supporting this statement.
44616	162	25	163	1	Landscape Table 3.8 [Rita Man Sze Yu, China]	Graphical designers are to decide on the final outlay of the chapter and on the potential use of landscape settings for tables.
46834	162	25	162	25	Second & thrid row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The table has been revised and now reflects formal IPCC uncertainty language with associated confidence statements.
52640	162	25	162	25	Some of the information presented in Table 3.8 is repeated from Table 3.7. Suggest removing some of this to make it more concise. Moslty related to Arctic section. [Charlotte Roehm, United States of America]	The Arctic is regarded as a climate change hot-spot and is also vulnerable to the existence of potential tipping points, it is thus unavoidable that there will be some overlap between the sections.
46836	163	1	163	1	Fourth & Bottom row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	The table has been revised and now reflects formal IPCC uncertainty language with associated confidence statements.
46888	163	1	163	1	Third, fourth & sixth rows of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - Calibrated language used where applicable.
13124	164		165		The chapter should include analysis for other regions as well. [Eleni Kaditi, Austria]	The authors are constrained by what is in the published literature
6372	164	1	166	7	The information contained in Box 3.9 could be presented in a much more reader friendly manner/style and potentially be condensed. [Anne Olhoff, Denmark]	Text extensively revised
18510	164	1	166	7	The information contained in Box 3.9 could be presented in a much more reader friendly manner/style and potentially be condensed. [Andrea TILCHE, Belgium]	Text extensively revised
38682	164	1	166	7	Box 3.9 is interesting, relevant and important. But as it is now it is not well enough integrated to the text of ch 3, as far as I can see. It comes a bit abruptly and is only mentioned once earlier in the chapter withouth any implications. I hope the text can refer to this box and use it where it is needed. [Jan Fuglestvedt, Norway]	Text extensively revised, new literature added, and key messages incorporated into chapter
22430	164	3			well below is too coloquial, I woudl say "below" [LUIS VALDES, Spain]	Accepted. Title of Box was revised.
61934	164	3	166	6	This box is a description with no assessment of confidence in methods or uncertainty of one pbulication (Hsiang et al , 2017), if I understand correctly. The issue of estimated economic damage should be carefully addressed in relationship to the box on economics in chapter 2, and the assesment of limits in integrated assessment models for including damage (section 2.6). Reading this box makes it impossible to understand what would be the causes of economic damage (which aspect of climate change, for which sector), and impossible to see if there is any link with the other parts of the chapter. The conclusion is difficult to understand ("patience is needed") unless it is just obvious (due to the time lag between emissions, climate change and impacts, obviously, ambition mitigation efforts will be perceived more in the near term than benefits of avoided damage compared to a hypothetic other pathway where no climate action was taken). Please consider carefully this box also in the context of the chapter 2 box on the social cost of carbon, are they consistent? [Valérie Masson-Delmotte, France]	Text extensively revised and new literature added
8898	164	4	164	4	2ºCand 1.5ºC' should be '2ºC and 1.5ºC' [Robert Shapiro, United States of America]	Accepted. Title of Box was revised.
12160	164	6	164	26	I don't see how a discussion of emission pathways is necessary or relevant here. Remove for brevity. [United Kingdom (of Great Britain and Northern Ireland)]	Removed
8900	164	21	164	21	discounted logarithmic derived utility generated by emissions through.' through cant be right ??? [Robert Shapiro, United States of America]	Removed
38684	164	22	164	22	Many readers may not be familar with the expression "Hotelling style", so I think this needs explanatipon. [Jan Fuglestvedt, Norway]	Removed
8902	164	23	164	24	for each of the four temperature targets:1715 and 2575 GtCO2, respectively.' What four temperature targets? Needs to be rewritten!! [Robert Shapiro, United States of America]	Removed
596	164	28	164	29	The Hsiang et al 2017 cumulative numbers include mortality valued using a value of a statistical life. As life, they are estimates of welfare loss measured in GDP terms; they are not estimates of GDP loss. [Robert Koppu, United States of America]	The authors report damages as GDP loss.
660	164	28	164	38	This paragraph should be better placed in the Figure legend (P165-166). [Maria Jesus Iglesias Briones, Spain]	Not applicable. Section was revised.
12162	164	28	165	12	This report will have a large non-expert audience. This section is written using highly technical language and as such will be difficult for a lay audience to engage with. The points made in this box are, however, very important. Please try to simplify the language used here so that a non-economist / non-scientist could understand and to draw out the key points. [United Kingdom (of Great Britain and Northern Ireland)]	Text extensively revised
38686	164	29	164	29	The shapes of the "temperature recation fucntions" is crucial for the results, and should get some more attention. [Jan Fuglestvedt, Norway]	Removed due to space limitations
46910	165		165		Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Not applicable. Figures have been removed from the text.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
24186	165	1	165	14	Low resolution and I think that it would be better to redraw those graphs using a sophisticated tool instead of Excel [Mustafa Tufan Turp, Turkey]	Not applicable. Figures were deleted.
24248	165	1	165	14	Figure 1 and Figure 2" low resolution and they should be renewed [Nazan AN, Turkey]	Not applicable. Figures were deleted.
60636	165	1	165	3	Delete statement: "This means that patience will be required while we proceed toward the more aggressive 1.5°C mitigation temperature target." [United States of America]	Removed
21542	165	5	166	7	The results for the "no-policy case" = the cost of doing nothing? This should be compared to the cost of adequate policies (and their benefits). In the short term, the cost of mitigation policies wil probably be superior to the benefits on GDP. [Nathalie HILMI, France]	Text extensively revised and new literature added
56742	165	12	165	12	Missed a half bracket at the end of this sentence? [Xiaolin Zhang, China]	Not applicable. Figures and captions were deleted.
46912	166		166		Colourblind check for this figure. Please avoid using greens and reds together in figures as they are hard to distinguish between. [Sarah Connors, France]	Not applicable - This text was deleted
12164	166	6	166	6	Not really much focus on adaptation implications of pathways as per scope here (or wherever appropriate in the chapter). Is there not much literature on this? Should be made clear. [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
56746	166	7	165	7	Missed a half bracket at the end of this sentence? [Xiaolin Zhang, China]	Not applicable - This text was deleted
6374	166	11	167	4	Why have these subsections here, if they are only a few lines long and mainly refer to the cross-section boxes? [Anne Olhoff, Denmark]	Not applicable. These subsections were removed.
18512	166	11	167	4	Why have these subsections here, if they are only a few lines long and mainly refer to the cross-section boxes? [Andrea TILCHE, Belgium]	Not applicable. These subsections were removed.
19634	166	13	167	3	These sections (3.6.1.1. and 3.6.1.2). are important but currently missing [Jennifer Morgan, Netherlands]	Not applicable - This text was deleted
49240	166	13			Recent literature looks into consequences of overshoots for sea level. Mengel et al. (2018) identify 20cm additional SLR in 2300 for 50 years of temperature overshoots under Paris Agreement compatible scenarios. [Bill Hare, Germany]	Noted. Will consider possibly citing this in final version if found to be critical.
53436	166	13	166	13	Versus (vs) should be changed to vs. [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be completed prior to publication
53554	166	13	166	13	Versus (vs) should be changed to vs. [mahnaz khazaei, Iran]	Editorial - copyedit to be completed prior to publication
46838	166	15	166	15	Second row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not clear what this is referring to. No table in Section 3.6.1.1.
10028	166	16	166	17	Challenge the feasibility of the 1.5oC global warming in a sustained gradual pathway as all 1.5oC scenarios include some level of overshoot. [Saudi Arabia]	Noted. Indeed, but this is not the topic of this chapter, this discussion belongs in chapter 2.
24318	166	16	166	17	This is incorrect. Chapter 2 now also includes a category of pathways that limit peak median warming to 1.5°C. This can be dealt with by writing that all pathways result in "some probability of overshooting the 1.5°C level". [Joeri ROGELJ, Austria]	Accepted. This will be corrected prior to publication.
24320	166	17	166	18	This is confusing interannual natural variations with the 1.5°C warming limit. Chapter 1 provides a definition for 1.5°C which excludes natural variability. This statement seems to confuse this. For example, in a steady state with 1.5°C of anthropogenically induced warming, one expects annual global mean temperature to exceed 1.5°C in 50% of the years. However, it would be wrong to consider each of these years "overshoots". The current text suggests that such an interpretation would be possible. See also a recent paper on this topic: Rogelj J, Schleussner C-F, Hare W. Getting It Right Matters: Temperature Goal Interpretations in Geoscience Research. Geophysical Research Letters 2017, 44(20): 10,662-610,665. [Joeri ROGELJ, Austria]	Accepted. This will be corrected prior to publication.
17844	167				Land cover of LULUCF (Forest, Agriculture, Grass, Wet, Residential) should be also explained. [Republic of Korea]	Not applicable - This text was deleted
10550	167	1	167	3	There is no clear information provided in this section. [Hong Yang, Switzerland]	Text revised
61936	167	1	169	34	There is a lof of overlap betwen this section and chapter 2 (especially sections related to land use, BECCS, section 2.6 on gaps in models) and with x chapter box 3.1. There a number of valid points, but it is very difficult for the reader to reach conclusions. What are the key findings? What are the implications for understanding the impacts and risks in a 1.5°C warmer world? What are the possible biases and what is the assessment of the authors related to their ealier conclusions which were based on simulations not taking into acount land use changes consistent with stabilisation pathways? [Valérie Masson-Delmotte, France]	text revised
6376	167	6	168	45	It is not clear that this section belongs in Chapter 3. It seems more relevant to move contents to Chapter 2 or 4 where BECCS and other carbon dioxide removal options and their implications are also discussed. [Anne Olhoff, Denmark]	Division of text between CH 3/4 has been considered. The section has been reworded to address the overlap with Ch 4 and to make it consistent with Ch 2.
18514	167	6	168	45	It is not clear that this section belongs in Chapter 3. It seems more relevant to move contents to Chapter 2 or 4 where BECCS and other carbon dioxide removal options and their implications are also discussed. [Andrea TILCHE, Belgium]	Division of text between CH 3/4 has been considered. The section has been reworded to address the overlap with Ch 4 and to make it consistent with Ch 2.
49242	167	8	170	10	This section 3.6.2.1 would need some restructuring. It should be broken up in sectiosn with more specific titles, and in Section 3.6.2.1.2 "Biophysical feedbacks on regional climate associated with land use changes" there are mentions of the impacts of land management on crop yields which do not belong here [Bill Hare, Germany]	The section has been restructured and reworded.
28426	167	10	169	34	AR and BECCS are often portrayed as being in competition, however they can be complementary, not competitive, if management is considered and not only landuse change / land cover. Please revise the section to strengthen this important difference. [Germany]	text revised
49244	167	10			This section is missing key recent publications and is not in sync with the much more comprehensive discussion in Ch 02. It should be proof-read by authors in Ch 02 and duplications deleted. [Bill Hare, Germany]	The whole section has been rewritten in collaboration with Ch 2 to address this issue
52642	167	10	168	45	There seems to be a large discussion about meeting 2oC by the end of the century when the target is 1.5oC. Yet it is well known that if 1.5oC is not kept stringently as a target that the consequences outlined in this chapter will ensue. As such, there needs to be consistent and continuous stress on meeting the 1.5oC target. Perhaps framing the discussion to meet 1.5oC targets whilst aiming at implementing 2oC mitigation strategies that would help not only avoid an overshoot, but also curb temperatures and GHGs to a more sustainable level. [Charlotte Roehm, United States of America]	We simply report the various literature that aims at 1.5 or 2C
49246	167	11	167	45	What are estimates of the total amount of C required to be sequestered via NETs (and especiallyBECCS) by 2100? And how does this number compare to the potential offset by deforestation to implement biofuel crops by up to 113GTCO2eq provided line 42? Using consistent units would help [Bill Hare, Germany]	These estimates are given in section 4.3.8 and units have been harmonized

Comment No	From Page	From Line	To Page	To Line	Comment	Response
10030	167	12	167	15	Feasibility of BECCS as a credible negative emission technology should be assessed in a broad context of competing with land use, food, water scarcity, and feedstock availability. Direct Air Carbon capture should be developed as it would have an immediate benefit on achieving the 1.5oC without competing with other natural resources. [Saudi Arabia]	This is now mentioned and a cross reference provided to section 4.3.8 where direct air capture is discussed
24322	167	12	167	15	While this information is correct, it does not say or imply much. These numbers are drawn from an ensemble of opportunity (the IPCC AR5 database) that was compiled in an arbitrary manner (modelling teams just submitted scenarios, but no special scenario selection was carried out). This statement tries to make a general point about the requirement or reliance of 2°C scenarios on negative emissions technologies based on this arbitrary set, which is not robust. [Joeri ROGELJ, Austria]	Text revised
24324	167	16	167	17	These estimates should be made consistent with the discussion and presentation of mitigation choices in Chapter 2. Presenting one point estimate to infer implications for the entire literature is neither robust not scientific. [Joeri ROGELJ, Austria]	The whole section has been rewritten in collaboration with Ch 2 to address this issue
49248	167	17	167	20	It seems odd to bring in the Paris Agreement here, as the wording was based on the IPCC's scenarios and the purpose of this report is to provide science, not policy interpretations [Bill Hare, Germany]	Reference to Paris Agreement deleted
51120	167	17	167	19	This is a highly tendencious statement in this context. Reference of the Paris Agreement to removals by sinks of GHG does by no means call for CDR technologies. There are non-technological and non-industrial means to strengthen removals by sinks such as ecological ecosystem restoration that come with less risks and social and ecological impacts. The Paris Agreement does not mandate CDR as opposed to other practices to strengthen ecological sinks, and it would not be in the spirit of the Paris Agreement to read this passage to mean CDR retrospectively. [Linda Schneider, Germany]	CDR includes reforestation that is ecosystem restoration. The text is reworded to make this clearer and indeed the whole section ends with a review of the potential role of ecosystem restoration in general
38688	167	18	167	18	You may add that the concept of 'balance' subject to interpretation, and clarifications are needed to make it operational; as discussed in Fuglestvedt, J., et al. Implications of possible interpretations of "greenhouse gas balance" in the Paris Agreement. Phil. Trans. Roy. Soc. A, doi: 10.1098/rsta.2016.0445, in press (2018). AND Rogelj J, Schaeffer M, Meinshausen M, Knutti R, Alcamo J, Riahi K, Hare W. 2015 Zero emission targets as long-term global goals for climate protection. Environ. Res. Lett. 10, 105007. (doi:10.1088/1748-9326/10/10/105007) [Jan Fuglestvedt, Norway]	Reference to Paris Agreement deleted
10032	167	19	167	20	Negative emission technologies such as BECCS and Direct Air Carbon capture will be required to achieve this. [Saudi Arabia]	Text revised
8904	167	20	167	20	achieve this.In scenarios' should be 'achieve this. In scenarios' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
50480	167	20	167	20	Missing space after 'this'. [Ina Möller, Sweden]	Not applicable - This section was rewritten
8906	167	21	167	21	extension of cropand' should be 'extension of crop and' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
50482	167	21	167	21	Missing 'l' in 'cropand' [Ina Möller, Sweden]	Accepted - Text was revised with the suggested edit
36036	167	22			Reference year needs to be added [India]	Not applicable - This section was rewritten
50484	167	22	167	22	Missing year after Guillod et al.; Seneviratne et al. [Ina Möller, Sweden]	Not applicable - This section was rewritten
13958	167	23	167	24	In the development of these scenarios, however, implications of these land use changes are generally not considered, beside their potential impacts on the carbon cycle. The RCPs used for the AR5 also underestimate current rates of deforestation in the tropics, suggesting that they are optimistic about land use, when using the BECCS as awell as current pressures. These same models than cut all future tropical deforestation, but don't specify the mechanism for this. If current ropical deforestqtion rtes continues, by themselves, it is likely to cause more than 1.5 degrees of warming without any future emissions from fossil fuels (Mahowald et al., 2017). Thus substantial changes in land use conversion need to be instituted in the future without BECCS being included. Mahowald, N. M., Ward, D. S., Doney, S. C., Hess, P. G., & Randerson, J. T. (2017). Are the impacts of land use on warming underestimated in climate policy? Environmental Research Letters, 12(9). https://doi.org/10.1088/1748-9326/aa836d [Natalie MAHOWALD, United States of America]	Now cited
24326	167	23	167	24	The IAM scenarios do not consider any temperature or climate feedbacks. So this point feels like focussing on one small aspect while disregarding the larger issue. [Joeri ROGELJ, Austria]	This is discussed in the preceding section
53988	167	24		30	The recognition of the impacts of BECCS on biodiversity, land use and food security that are reflected here needs to be integrated in the key messages of the executive summary and the summary for policy makers. [Elenita Daño, Philippines]	Accepted. Message will be included in SPM
24328	167	27	167	28	Also here, these estimates should be made consistent with the discussion and presentation of mitigation choices in Chapter 2. Presenting one point estimate to infer implications for the entire literature is neither robust not scientific. [Joeri ROGELJ, Austria]	The whole section has been rewritten in collaboration with Ch 2 to address this issue
28428	167	27	167	45	Please check whether the studies on BECCS only include biofuels directly grown and harvested to generate bioenergy or also include biomass-derived products being used as fuel at the end of their "material" lifespan. If this possibility is neglected, the land area needed to generate biomass for BE is overestimated. Please explain in the text. [Germany]	This aspect is covered in the text, it is made clear where primary biofuels are referred to and where the biofuel is coming from residues so that the land footprint can be lower.
49250	167	27	167	28	At different parts of the report (ch 3 and 4) different units are used for the potential of BECCS / bioenergy. Here CO2 sequestration is given, but elsewhere a 100 EJ potential is given. This is confusing to the reader, and it should be made clear how these are consistent with each other. [Bill Hare, Germany]	Units have been harmonized
32674	167	28	167	30	Maybe worth to include a footnote with the definition and examples for primary and secondary biofuels. [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Noted
50486	167	28	167	28	Double space after (Smith et al., 2015) [Ina Möller, Sweden]	Accepted - Text was revised with the suggested edit
10552	167	31	167	32	Wired sentence. [Hong Yang, Switzerland]	Not applicable - This section was rewritten
50488	167	31	167	32	Consider including the more recent results on this calculated by Boysen, Lucht, Gerten et al. 2017 (Earth's Future) and Yamagata et al. 2018 (Sustainability Science), also with view to ecosystems and biodiversity [Ina Möller, Sweden]	Both are now cited in revised text
45640	167	34	167	35	I suggest highlighting here the pressure over the local farmers with subsistence economy, which are displaced from their lands loosing their only chance to get their own food, which is specially worrying in poor areas of Latin America and Africa. [Adela M Sánchez-Moreiras, Spain]	This is relevant for other chapters and cannot be included here
50490	167	34	167	34	Double space after 'losses.' [Ina Möller, Sweden]	Not applicable - This section was rewritten
32676	167	35	167	37	...and from other land-based CDR, such as A/R. [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Text revised
53990	167	35		43	The recognition of the impacts of BECCS & afforestation on biodiversity, land use and food security that are reflected in these paragraphs need to be integrated to the key messages of the executive summary/summary for policy makers. [Elenita Daño, Philippines]	Accepted. Message will be included in SPM

Comment No	From Page	From Line	To Page	To Line	Comment	Response
29546	167	37			The concept of (absence of) "global forest protection" is not clear. There are several global instruments to sustainable use and conservation forests and forest areas, such as UNFF, REDD and CBD as well as many regional and national instruments. Does writers actually mean a global agreement/convention on forests? [Finland]	Space does permit explanation that this is a mathematical construct - in the paper Smith compares a world in which all the forest is protected to one in which none of it is protected.
32678	167	37	167	45	The last two sentences need to be backed up by references. In addition, the section should discuss ways to reduce those iLUC emissions, e.g. use of waste biomass. [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Text revised
34140	167	37	167	45	These well-written messages are important in order to understand the dilemmas associated with implementing BECCS at a large scale. The current version of the SPM and Ch. 3 Executive Summary gives us the impression that large scale BECCS is a necessary and viable mitigation option to prevent more than 1.5 degrees global warming. The information here tells a more nuanced story. We wish for more transparency around the underlying assumptions in the IAMS, as these assumptions are crucial for policy makers to make informed decisions. Please consider to rephrase relevant statements in the SPM and Executive Summary to better reflect these important findings (p 167 line 37-45). [Norway]	Accepted. Message will be included in SPM
55662	167	37	167	45	iLUC issue also needs to be refelcted in Chapters 2 and 4. [David Cooper, Canada]	Noted.
22432	167	44			insert space between "doinclude" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
35262	167	44	167	44	The spacing is missing between words "doinclude" [Shaukat Ali, Pakistan]	Not applicable - This section was rewritten
50492	167	44	167	44	Missing space in 'doinclude' [Ina Möller, Sweden]	Not applicable - This section was rewritten
54490	167	44	167	45	There is a typo 'doinclude'. Also, this seems a very important point to settle with nuance. The argument agains biofuels seems very strong, in terms of overestimating their potential. But they are not rendered the same way everywhere and in some instances production for local uses can be sustainable and efficient. The analysis is presented in a seemingly one-size-fits all way. Perhaps it is a question of cross-referencing with the knowledge gaps section later on, or just making these caveats. [Thomas Thornton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This section was rewritten
8908	167	49	167	49	and changesindiet.' should be 'and changes in diet.' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22434	167	49			insert space between "changesindiet" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
35264	167	49	167	49	The spacing is missing between words "changesindiet" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
50494	167	49	167	49	Missing spaces in 'changesindiet' [Ina Möller, Sweden]	Accepted - Text was revised with the suggested edit
34142	168	2	168	5	Here it is stated that the forest area remains constant. How does this fit with the information in table 2.11 about the large increase in forest area up to 2050? Please consider to explain the difference, to improve consistency. [Norway]	The whole section has been rewritten in collaboration with Ch 2 to address consistency
35266	168	7	168	20	Following study should be cited where appropriate: Several types of models such as empirical crop models, regional suitability models, biophysical models, meta-models and decision models can be used for short term and long term adaptation planning in agricultural production systems. Reference:Annelie Holzkämper, (2017), Adapting Agricultural Production Systems to Climate Change—What's the Use of Models? , Agriculture. [Shaukat Ali, Pakistan]	This type of general discussion belongs in AR6 and could not be included here due to space reasons (it is also more relevant to chapter 4 on adaptation).
36038	168	8	168	8	May consider adding - However, adoption of low GHG emitting management options and additional adaptation measures cost the small and marginal farmers of tropics (Naresh Kumar et al., 2016)..same ref as in 28. [India]	This type of general discussion belongs in AR6 and could not be included here due to space reasons (it is also more relevant to chapter 4 on adaptation).
40848	168	8	168	8	However, adoption of low GHE emitting management options and additional adaptation measures cost the small and marginal farmers of tropics (Naresh Kumar et al., 2016)..same ref as in 28. [NARESH KUMAR SOORA, India]	This type of general discussion belongs in AR6 and could not be included here due to space reasons (it is also more relevant to chapter 4 on adaptation).
36040	168	10			Reference year for Warren et al needs to be added [India]	Accepted - Text was revised with the suggested edit
50496	168	10	168	10	Missing year and extra 'c' in 'Warrant c et al., plus missing space before 'At' [Ina Möller, Sweden]	Accepted - Text was revised with the suggested edit
32680	168	12	168	14	You should mention the importance of demand side changes here, e.g. dietary changes. [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Text revised
21544	168	22	168	24	The impact will not be the same everywhere. Regional diferentiation may be interesting to consider here. [Nathalie HILMI, France]	There is no space to do this.
49252	168	22	168	24	This statement about the reduction of agricultural yields "and/or" land management decisions related to NETs having implications for food security, and associated economic consequences, is misleading for several reasons. Firstly, climate change impacts on agricultural yields fall into a very different category of impacts to land management decisions for mitigation, and these interact with each other (a lack of mitigation would lead to greater impacts). Second, it's not only NETs that would affect food security etc. Bioenergy without CCS would also affect land management, and studies have shown that lower BECCS deployment results in greater bioenergy deployment (e.g. the Muratori paper cited shows this) [Bill Hare, Germany]	Text revised
46840	168	23	168	23	Third and fifth row of table: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Table being referred to unclear.
22436	168	24		26	A comma must be inserted in between of the authors names and the year of publication (three cases in these lines) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
2222	168	29	168	36	Yamagata et al. (2018) analyzed the tradeoff between BECCS deployment and land systems such as water resources and ecosystem services through land-use change. Reference: Yamagata Y, Hanasaki N, Ito A, Kinoshita T, Murakami D, Zhou Q (2018) Estimating water-food-ecosystem trade-offs for global negative emission scenario (IPCC-RCP2.6). Sustainability Science. DOI: 10.1007/s11625-017-0522-5 [Akihiko Ito, Japan]	Cited
42800	168	29	168	36	"[T]he land requirements to make BECCS work would vastly accelerate the loss of primary forest and natural grassland. Thus, such dependence on BECCS could cause a loss of terrestrial species at the end of the century perhaps worse than the losses resulting from a temperature increase of about 2.8 °C above pre-industrial levels." Williamson, P., Emissions reduction: Scrutinize CO2 removal methods (Nature Comment, 10 February 2016). [Kristin Campbell, United States of America]	Now cited

Comment No	From Page	From Line	To Page	To Line	Comment	Response
43044	168	29	168	36	"[T]he land requirements to make BECCS work would vastly accelerate the loss of primary forest and natural grassland. Thus, such dependence on BECCS could cause a loss of terrestrial species at the end of the century perhaps worse than the losses resulting from a temperature increase of about 2.8 °C above pre-industrial levels." Williamson, P., Emissions reduction: Scrutinize CO2 removal methods (Nature Comment, 10 February 2016). Moreover, BECCS is not carbon neutral for decades to century time scale. Booth M. S. (2018) "Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy", Envtl. Research Letters; and Sterman et al (2018) "Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy", Envtl. Research Letters. [Durwood Zaelke, United States of America]	We agree these are important and have cited them all.
49254	168	29	168	30	Afforestation and reforestation aren't always an "alternative" to BECCS. This makes it sound like BECCS is the default option, and that the use of A/R would mean no need for BECCS. It is true that they may compete for the same land, but there are also examples where they do not (e.g. where crop residues are used for BECCS) [Bill Hare, Germany]	text revised
49256	168	29	168	36	This paragraph is confusing in its mixing up of "afforestation" and "reforestation". Some literature treates them together, but other literature clearly distinguishes between the two (e.g Griscom et al.). This paragraph goes from talking about the land requirements of afforestation to discussing that not all of this land use is in competition with biodiversity protection because restoring natural ecosystems could have benefits for biodiversity...but restoring natural ecosystems would be more readily associated with reforestation. [Bill Hare, Germany]	Text revised
55666	168	29	168	45	Need to update this dicussion in light of rcent literature, notably Griscom et al (2017) which shows high mitigation (and CDR) potential of ecosystem based/ AFOLU measures even when constrainign for food production and biodiversity conservation, with potential benefits for the latter. [David Cooper, Canada]	Cited
24330	168	32	168	32	This statement is not supported by the study. One single scenario cannot provide evidence for a "requirement". It only provides evidence that one potential implementation might be possible. Chapter 2 discusses a range of potential implementations of mitigation pathways making a clear distinction between evolutions that have been assessed to potentially be "consistent" with a world in which warming is kept to 1.5°C or 2°C, and evolutions that are "required" to do so. [Joeri ROGELJ, Austria]	Text revised
29646	168	34	168	36	Please insert Pistorius and Freiburg (2014) for a discussion of Forest Landscape Restoration. Reference: Pistorius, T. and Freiberg, H., 2014. From Target to Implementation: Perspectives for the International Governance of Forest Landscape Restoration. Forests, 5 (3), 482–497 [Mareike Blum, Germany]	Now cited
49690	168	35	168	36	Where reforestation is… This argument is not convincing and disregards terminological controversies. Most of what will be practiced as 'restoration' is not natural rehabilitation, but reforestation/afforestation/reclamation/replacement etc. (Stanturf et al. 2014) and not yield biodiversity conservation (of pristine forests), because it intends productive landscapes for human use - incl. Agroforestry systems - which is important for social acceptability. There are many different understandings of what restoration is also because of different interests /objectives. Please consider more 'discourse' oriented and conceptual references, e.g.: Pistorius, T.; Kiff, L. (2017). From a biodiversity perspective: risks, trade-offs, and international guidance for Forest Landscape Restoration. Freiburg, Unique; Stanturf, John A., Palik, Brian J., Dumroese, R. Kasten (2014): Contemporary forest restoration: A review emphasizing function, Forest Ecology and Management, 331: 292-323, Stanturf, John A, Brian J Palik, Mary I Williams, R Kasten Dumroese, and Palle Madsen. 2014. 'Forest Restoration Paradigms', Journal of Sustainable Forestry, 33: S161-S94. And particularly: Bäckstrand, K., & Lövbrand, E. (2006) Planting Trees to Mitigate Climate Change: Contested Discourses of Ecological Modernization, Green Governmentality and Civic Environmentalism. Global Environmental Politics, 2006 (1: Feb), pp. 50–75. [Sabine Reinecke, Germany]	This is important, and is now reflected in the text, but there is not space for a detailed discussion, the matter is also covered in section 4.3.8
49258	168	38	168	45	This section on more sustainable land use options is very short compared to the substantial section above on the risks of first generation bioenergy. There is much more literature than is referenced here that considers bioenergy deployment that interferes less with land competition, e.g. Diaoglou et al 2016, Haberl et al 2013 and 2010, van Vuuren et al 2009, Fajardy et al 2017, [Bill Hare, Germany]	These are now cited
38690	168	39	168	39	Relevant: references: Walsh B, Ciais P, Janssens IA, Peñuelas J, Riahi K, Rydzak F, van Vuuren DP, Obersteiner M. 2017 Pathways for balancing CO2 emissions and sinks. Nat. Commun. 8, 14856. (doi:10.1038/ncomms14856), AND Rogelj J, Schaeffer M, Meinshausen M, Knutti R, Alcamo J, Riahi K, Hare W. 2015 Zero emission targets as long-term global goals for climate protection. Environ. Res. Lett. 10, 105007. (doi:10.1088/1748-9326/10/10/105007) AND Fuglestvedt, J., et al. Implications of possible interpretations of "greenhouse gas balance" in the Paris Agreement. Phil. Trans. Roy. Soc. A, doi: 10.1098/rsta.2016.0445, in press (2018). [Jan Fuglestvedt, Norway]	Carbon balance in the Paris Agreement is now discussed only in Ch 2 (check with Joeri) as space constraints required this to be deleted from this section when the text was revised.
49260	168	48	169	34	This section is currently leaving out most of the relevant aspects related to the biophysical effects of land-use changes on climate. Only temperature extremes are addressed here, but many other variables are relevant. An important message should be that the final impact on temperature depends on the considered type of land-use, the affected region as well as the considered region (or type of extremes). It is generally accepted that reforestation will entail a local annual mean warming at high latitudes due to a predominant albedo effect, but lead to a cooling at low latitudes due to a dominant increase in evapotranspirative efficiency, while having a mixed impact at mid-latitudes (e.g. Bonan et al. 2008, Arora et al. 2011). However, it should be noted that these effects have been observed to vary strongly depending on the season or the time of the day (Lee et al., 2011). [Bill Hare, Germany]	Noted. Will consider including some of the mentioned references prior to publication
49262	168	48	169	34	There are strong uncertainties about the future biophysical effects of land-use changes, and one reason is because it depends on the future dominant pattern of land-use change. Reforestation will for example have a very different impact than the development of biofuel croplands at the expense of forests. This scenario uncertainty adds to the strong model disagreements and systematic biases on these aspects (Brovkin eta al. 2013, Boysen et al. 2014, Lejeune et al. 2017). Furthermore, the impacts of land-use changes on precipitation are not well understood, despite evidence that small-scale deforestation patterns can influence local mesoscale systems (Wang et al, Mahmood), and that large-scale albedo modifications would influence large-scale circulation patterns and monsoon systems (Devaraju et al. 2015). All these points are also worth being mentioned in the report. The focus on temperature extremes is nevertheless deserved because of the number of consistent studies showing the relevance of biophysical effects in terms of risk mitigation in that context (higher amplitude than for mean climate) [Bill Hare, Germany]	Noted. These aspects appear too detailed given space constraints. Will consider including them in text if critical prior to publication.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
49264	168	48	169	34	1.Bonan et al. 2008: Forests and Climate Change: Forcings, Feedbacks, and the Climate Benefits of Forests, Science. 2. Arora et al. 2011: Small temperature benefits provided by realistic afforestation efforts, Nat Geosc. 3. Brovkin et al. 2013: Effect of Anthropogenic Land-Use and Land-Cover Changes on Climate and Land Carbon Storage in CMIP5 Projections for the Twenty-First Century. 4. Boysen et al, 2014: Global and regional effects of land-use change on climate in 21st century simulations with interactive carbon cycle. 5. Lejeune et al. 2017: Historical Land-Cover Change Impacts on Climate: Comparative Assessment of LUCID and CMIP5 Multimodel Experiments. 6. Wang et al, 2009: Impact of deforestation in the Amazon basin on cloud climatology. 10. Mahmood et al, 2014: Land cover changes and their biogeophysical effects on climate. 11. Devaraju et al. 2015: Effects of large-scale deforestation on precipitation in the monsoon regions: Remote versus local effects [Bill Hare, Germany]	Noted. Bonan 2008, Brovkin et al. 2013, and Wang et al. 2009 are too old for SR15 (pre-AR5). Will consider including references to Boysen et al. 2014, Lejeune et al. 2017, Mahmood et al. 2014, and Devaraju et al. 2015.
5412	168	49	168	51	surface emissivity [Fatemeh zabol Abbasi, Iran]	Comment unclear.
5404	168	50	168	51	surface emissivity [Fatemeh zabol Abbasi, Iran]	Comment unclear.
22438	169	1		6	A comma must be inserted in between of the authors names and the year of publication (more than twenty cases in these lines) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
32318	169	1			Mueller et al. citation year should be 2016? http://dx.doi.org/10.1038/nclimate2825 [Aaron Glenn, Canada]	Accepted - Text was revised with the suggested edit
32320	169	3			Mueller et al. citation year should be 2016? http://dx.doi.org/10.1038/nclimate2825; delete "B." [Aaron Glenn, Canada]	Accepted - Text was revised with the suggested edit
5394	169	5	169	5	Smart Agriculture [Fatemeh zabol Abbasi, Iran]	Rejected. Conservation agriculture is a generic term.
5406	169	5	169	8	Smart Agriculture [Fatemeh zabol Abbasi, Iran]	Rejected. Conservation agriculture is a generic term.
24332	169	8	169	8	Maybe choose a post-AR5 reference that presents new 1.5°C scenarios here. [Joeri ROGELJ, Austria]	Accepted. Will add 1-2 publications on 1.5°C scenarios prior to publication.
8910	169	10	169	10	for temperaturesextreme.' should be 'for extreme temperatures.' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22440	169	10			insert space between "temperaturesextreme" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
35268	169	10	169	10	The spacing is missing between words "extremetemperature" [Shaukat Ali, Pakistan]	Accepted - Text was revised with the suggested edit
50498	169	10	169	10	Typo and missing space in 'temperaturesextreme' [Ina Möller, Sweden]	Accepted - Text was revised with the suggested edit
22442	169	12		13	A comma must be inserted in between of the authors names and the year of publication (five cases in these lines) [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
22444	169	21			A comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
49266	169	23	169	30	This paragraph is misleading. The language used suggests only negative consequences of land use change and land management on crop yields. This is very debatable and especially not consistent with what the mechanisms mentioned in the previous paragraph suggest, i.e. that the alleviation of hot extremes by the biophysical effects of land management practices would lessen the negative impacts of extremely high temperatures on crop yields. [Bill Hare, Germany]	Rejected. The paragraph addresses other aspects than those induced by biophysical impacts of land use ("In addition to biophysical impacts from land use...")
22446	169	28			A comma must be inserted in between of the authors names and the year of publication [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
6378	170	13	171	10	The messages of this subsection are very hazy and should be brought out more clearly. [Anne Olhoff, Denmark]	Accepted. With the other comments here, we modify to make the goals more clear.
12166	170	13	170	13	I think this discussion would benefit from more clearly describing the interesting results from Wang et al https://www.nature.com/articles/srep46432 [United Kingdom (of Great Britain and Northern Ireland)]	Accepted: reference added
18516	170	13	171	10	The messages of this subsection are very hazy and should be brought out more clearly. [Andrea TILCHE, Belgium]	Accepted. With the other comments here, we modify to make the goals more clear.
55038	170	13	171	10	There is a lot that could be said about the opportunity to reduce the rate of near-term warming by reducing the emissions of methane, but also HFCs and those measures which reduce signficant amounts of black carbon (in relation to cooling aerosols like OC). This is outlined in Shdinell et al 2012 in Science outlinging the opportunities to reduce near term warming and achieve 1.5 oC and Shindell et al 2017 in Science wher ethe patheway to the Paris targets are outlined. Clearly there is a big opportunity also being explored by the Climate and Clean Air Coalition which is totally ignored here. [Johan Carl Ivar Kuylenstierna, United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Sentence and reference added).
4528	170	15	170	16	I would slightly reformulate the sentence: 'Projected decreases in cooling aerosols in the next few decades may cause more warming than from greenhouse gases (Kloster et al., 2009; Navarro et al. 2017), specially in the low CO2 pathways. " to something like "Enforcement of strict air quality policies will very likely lead to a large decrease in cooling aerosols emissions in the next few decades. These aerosol emission reductions may cause a comparable warming to the increase in greenhouse gases by mid-21st century in the low CO2 pathways (Kloster et al., 2009; Acosta Navarro et al. 2017). [Juan Camilo Acosta Navarro, Spain]	Accepted: sentence rephrased.
4530	170	17	170	20	Please change the citation from Navarro, J. et al. to Acosta Navarro, J et al. (I am the first author and would like to keep the spanish naming with two last names if possible) [Juan Camilo Acosta Navarro, Spain]	Accepted: sentence rephrased.
46842	170	18	170	18	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted: sentence rephrased.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
32820	170	23	170	25	Though true that it one looks at the case with a fixed amount of greenhouse gas reductions (though not sure what the unit would be as CO2e wouldn't work well for gases with different lifetimes), then reducing methane INSTEAD of CO2 would indeed lead to reduced warming in the near-term and potentially increased warming in the long-term. However, there is ample evidence that in the real world such reductions are not a zero-sum game and this stiuation is quite artificial and hence misleading. Efforts such as the Global Methane Initiative have not alleviated the need or even the perceived need to reduce CO2, and policy studies such as Victor et al., Nature Climate Change, 2015 have suggested that successes in reducing shorter-lived pollutants (that would hence respond rapidly) could in fact motivate further action on CO2 so the effect is more likely to be complementary than competitive. We discuss this in some detail in Shindell et al., Science, 2017, which also points out the real world example of California, which recently enacted legislation with large reduction targets for methane and also has the most ambitious CO2 targets in the United States, demonstrating that ambitious SLCF and CO2 policies can go hand in hand (the Kigali Amendement is similar - good for near-term climate but could be framed as bad if HFC reductions were instead of CO2, but again no reason to believe that's the case). Furthermore, chapter 2 describes quite clearly how in scenarios with very low warming targets such as 1.5C, it becomes virtually impossible to reduce CO2 enough to meet the target in cases in which non-CO2 warming agents such as methane are not also reduced. Finally, the report is supposed to look at climate in the context of sustainable development, and methane reductions bring large benefits in addition to those associated with climate change mitigation via improved air quality and agriculture (see, e.g., Shindell et al., Faraday Disc., 2017 though this is well known). In light of all these facts, I'd think the most useful message to readers would be the necessity of and multiple benefits from methane reductions rather than what now reads as a wariness associated with methane reductions and some statements about methane affecting oxidants that are not very useful (basic background atmospheric chemistry, but not really needed here). Such a framing would be consistent with the results presented in chapter 2 in contrast to the current framing discussing pathways that rely on methane vs CO2 as no such pathways exist in chapter 2 (both are required for 1.5C). [Drew SHINDELL, United States of America]	Accepted. Referenced added and point added to text.
56016	170	23	170	25	Such pathways exchanging methane and CO2 are not otherwise noted here, is there a reason to raise this particular trade-off as opposed to other kinds of trade-offs of GHGs? The noted pathways all assume intense reductions in both. [Pamela Pearson, United States of America]	Noted. Text modified to identify synergies as well as tradeoffs per comment 32820
54270	170	24	170	24	suggested text addition - ...such a strong and shorter-lived greenhouse gas in the atmosphere [Nathan Borgford-Parnell, Switzerland]	Accepted. Text modified.
22448	170	25			insert space between "CO2(Myhre" [LUIS VALDES, Spain]	Editorial - copyedit to be completed prior to publication
5408	170	30	170	33	also Aerosols effect on clouds,surface Insolation and Surface Temperature [Fatemeh zabol Abbasi, Iran]	Noted. The text here focuses on impacts on humans and ecosystems, not the physical system.
32818	170	31	171	2	While true that methane can enhance (or reduce) ozone, it nearly always enhances ozone over land areas and so rather than just saying the ozone response can go in either direction it'd be more useful to say this. [Drew SHINDELL, United States of America]	Accepted. Sentence changed.
8912	171	3	171	3	exhchange at' should be 'exchange at' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
22450	171	3			replace "exhchange" by "exchange" [LUIS VALDES, Spain]	Accepted. Text modified.
22452	171	4			insert space between "Carbon(Wang" [LUIS VALDES, Spain]	Accepted text modified.
5410	171	6	171	7	Total solar radiation decreased by Aerosol [Fatemeh zabol Abbasi, Iran]	Accepted. Will clarify prior to publication that diffuse radiation is increase but total incident shortwave radiation is decreasing.
5396	171	7	171	7	also Aerosols effect on clouds,surface Insolation and Surface Temperature [Fatemeh zabol Abbasi, Iran]	Not clear what the reviewer is suggesting to change here.
5398	171	7	171	7	Total solar radiation decreased by Aerosol [Fatemeh zabol Abbasi, Iran]	Accepted. Will clarify prior to publication that diffuse radiation is increase but total incident shortwave radiation is decreasing.
6380	171	13	171	19	Why include this subsection on SRM here? Why not leave it to Chapter 2 and 4? [Anne Olhoff, Denmark]	Not applicable - This text was deleted
18518	171	13	171	19	Why include this subsection on SRM here? Why not leave it to Chapter 2 and 4? [Andrea TILCHE, Belgium]	Not applicable - This text was deleted
38692	171	13	171	19	You may add a short discusison of SRM vs balance. See Fuglestvedt, J., et al. for a short discission of this: Implications of possible interpretations of "greenhouse gas balance" in the Paris Agreement. Phil. Trans. Roy. Soc. A, doi: 10.1098/rsta.2016.0445, in press (2018). [Jan Fuglestvedt, Norway]	Not applicable - This text was deleted
51122	171	13	171	19	Unclear what the purpose of this paragraph is. Should be deleted. [Linda Schneider, Germany]	Accepted - This text was deleted
61938	171	15	171	20	no content here, remove the subsection and refer to the x chapter box on solar radiation management upfront. [Valérie Masson-Delmotte, France]	Accepted - This text was deleted
5400	171	16	171	19	Cool roof systems with high reflectance and emittance and Green roof [Fatemeh zabol Abbasi, Iran]	Not applicable - This text was deleted
5414	171	16	171	17	Cool roof systems with high reflectance and emittance and Green roof [Fatemeh zabol Abbasi, Iran]	Not applicable - This text was deleted
56968	171	16	171	18	It seems to me that "highlighted" rather overstates the discussion of this issue in Chapter 1. [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
53992	171	19			Replace the name RMM for SRM. The change of name from SRM to RMM seem to have the purpose of distract the attention of the readers from the many potential impacts associated with Solar Radiation Management and geoengineering. RRM is a very general description that downplays the real intent behind these technologies which is managing the sun's effects on the planet which is graphically captured in the term SRM. It would be not responsible of IPCC to play this game of geoengineers who intend to package SRM acceptable among policy makers and the public in general. [Elenita Daño, Philippines]	Not applicable - This text was deleted
6382	171	22	172	33	Why not move these few subsections and integrate them in the preceding sections on permafrost, etc? It would make for a more readerfriendly structure. [Anne Olhoff, Denmark]	Good point - have reduced this overlap by moving all material from 3.3 that is relevant to beyond end of century here rather than other way around. LAs felt that important to have one location for beyond end of century rather than spreading throughout chapter
10554	171	22	173	33	The description of this section is not directly related to the subtitle of section 3.6, that is, the implications of different mitigation scenarios. [Hong Yang, Switzerland]	Taken into account - title of 3.6 modifiifed
16420	171	22	171	33	No mention of Southern Ocean or other non-Arctic sea ice in this subsection. [Australia]	Sea ice is discussed in relevant subsection of 3.3, Antarctic sea ice omitted because lack of a strong message relevant to 1.5

Comment No	From Page	From Line	To Page	To Line	Comment	Response
18520	171	22	172	33	Why not move these few subsections and integrate them in the preceding sections on permafrost, etc? It would make for a more readerfriendly structure. [Andrea TILCHE, Belgium]	Good point - have reduced this overlap by moving all material from 3.3 that is relevant to beyond end of century here rather than other way around. LAs felt that important to have one location for beyond end of century rather than spreading throughout chapter
61940	171	22	172	33	This comes too late and should be merged with other sections (ice sheets, permafrost, sea level) to avoid repetition. I note that the chapter has very litle finding for the southern Ocean and Antarctica (outside the Antarctic ice sheet part) in terms of projected impacts and risks. It would be worth to check the coherency of the assessment for this region (Southern Ocean, sea ice, krill, resources, biodiversity) given the irreversible aspect of heat accumulation in the Southern Ocean and the implications of e.g. acidification. I am a co-authors of a related manuscript (Rintoul et al, Chosing the future of Antarctica, Nature, resubmitted after revision) that may be relevant to provide more substance, especially on the marine biology side. [Valérie Masson-Delmotte, France]	Good point - have reduced this overlap by moving all material from 3.3 that is relevant to beyond end of century here rather than other way around. LAs felt that important to have one location for beyond end of century rather than spreading throughout chapter
52644	171	24	171	31	While the extent and possible return of summer sea ice is feasible, what are the consequences of a drastically different ice sheet composition, thickness and volume on ecosystem functioning and services, as well as feedback on climate change? Ice volume has decreased by 47% below 1979-2016 mean. [Charlotte Roehm, United States of America]	Non-climate related impacts such as those on ecosystems are discussed in 3.4
43046	171	25	171	31	Inconsistent with the definition of tipping points in Box 3.5. [Durwood Zaelke, United States of America]	Box 3.5 has now been removed
54266	171	25	171	31	This section could be strengthened with at least some discussion of the climate implications of the total loss of Arctic summer sea ice. Pistone et al. 2014 found that the increased forcing due to the loss of Arctic summer sea ice between 1979 and 2011, if averaged globally, is equivalent to 25% of the forcing from CO2 over the same period. While all climate tipping points have the potential to rapidly destabilize climate, social, and economic systems, some – like the loss of summer Arctic sea ice – are also self-amplifying feedback mechanisms, where initial warming feeds upon itself to cause still more warming action as a force multiplier (Schuur et al., 2015). [Nathan Borgford-Parnell, Switzerland]	The cited literature strongly suggests that the loss of summer sea ice NOT a self-amplifying mechanism, and this was the assessment of AR5
3836	171	27			sea ice: under which conditions could this happen? Somewhat unclear, any? [Olaf Eisen, Germany]	Accepted - clarification added
49268	171	34			Like the SLR chapter above, the discussions of SLR in this report are not on top of the recent literature and fall short of discussing key risks. And it basically only repeats what has been stated before. Scenario dependence of SLR in the mid-to-long term, however, is of outmost relevance to inform policy makers and there is a growing body of literature that can be referenced here. It is not at all clear, why this has not been done. [Bill Hare, Germany]	Noted and this aspect of the draft has received considerable attention however LAs are expected to focus very much on 1.5/2.0 for which the literature is limited
54268	171	34	171	50	The issue of sea-level rise is perhaps one of the best examples of the importance of reducing anthropogenic climate forcing as quickly as possible and highlights how different emissions species can impact the climate in very different and important ways. While cumulative sea-level rise is an important indicator for climate impacts, but the rate of sea-level rise also has important implications for climate impacts and adaptation. Reducing the rate of sea-level rise will give vulnerable countries and populations critical time to adapt. According to a 2013 study (Hu A. et al. (2013) Mitigation of short-lived climate pollutants slows sea-level rise, Nature Climate Change 3:730-734), aggressively cutting emissions of short-lived climate pollutants, including methane, HFCs, and black carbon aerosols, can reduce the rate of sea-level rise by approximately 18% by 2050 and 24% by the end of the century. In contrast, the benefit of cutting CO2 on reduced sea-level rise accrues very slowly in the first half of the century, but increases rapidly after 2050 to equal the rate of reduction of SLCPs by 2100, bringing the total reduction in the rate of sea-level rise to nearly 50%. Combined mitigation could reduce cumulative sea-level rise by 31% by 2100, with SLCPs providing 71% of the total (41% from methane measures, 13% from HFC measures, and 17% from black carbon), The remaining 29% is from CO2. [Nathan Borgford-Parnell, Switzerland]	This is valuable however the focus needs to be strongly on 1.5 and 2C worlds because of issue of available space
8360	171	35	172	21	This section discusses changes in sea level rise due to warming, giving the data of the 1.5? and 2? scenarios for the weakest contributors: Thermal expansion and glacier. But the strong contributor of the melting ice in Greenland and Antarctic is discussed only in terms of general long-term trends with no differences between the 1.5? and 2? scenarios given, nor is stated the recoverability of the sea level after the fall in warming. It is suggested that a more consistent analysis be made of the 1.5? impact. [China]	Material from 3.3 has been moved to this section so that there is no more detail on greenland and antarctica
46844	171	35	171	35	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - replaced
49486	171	37	171	39	New paper (not yet accepted) - Goodwin et al. (Earth's Future) would also be an appropriate citation here on post 2100 scenarios. [Sally Brown, United Kingdom (of Great Britain and Northern Ireland)]	Other literature available is not clear Goodwin adds additional info
3838	171	42			add blank after superscript -1 [Olaf Eisen, Germany]	Accepted - Text was revised with the suggested edit
3840	171	44			worlds, respectively [Olaf Eisen, Germany]	Accepted - Text was revised with the suggested edit
46846	171	45	171	45	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Accepted - replaced
5402	171	50	172	1	in this index time or period should be considered [Fatemeh zabol Abbasi, Iran]	Indicator added annual
3842	172	1			do you mean ELA or total mass balance of the GrIS? [Olaf Eisen, Germany]	Avoided use of ELA because it is a specialists term
5416	172	1	172	2	in this index time or period should be considered [Fatemeh zabol Abbasi, Iran]	Indicator added annual
3844	172	3			blank before suggest [Olaf Eisen, Germany]	Accepted - Text was revised with the suggested edit
22454	172	3			insert space between "howeversuggest" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
10034	172	5	172	7	Existence of significant knowledge gaps should be reported in the SPM to better inform on the uncertainties on some claims or conclusions. [Saudi Arabia]	check section 3.7
3846	172	8			add "by melting" after directly [Olaf Eisen, Germany]	Unnecessary as this is preceded by melt to the ocean
3848	172	8			misleading, as Greenland does the same by runoff -> directly to the ocean [Olaf Eisen, Germany]	This is not the same because greenland surface melt happens out of contact with the ocean. The melt is subsequently transported as runoff to the ocean
22456	172	13			insert space between "retreat(Schoof" [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
56018	172	21	172	21	Consider adding, "Overshoot scenarios, especially of higher or longer duration such as that contemplated under current NDCs, can be anticipated to increase the risk of such irreversible collapse." [Pamela Pearson, United States of America]	Accepted - have added

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9406	172	24	172	27	Comparing two different things here. Chadburn considers total loss of permafrost when equilibrium conditions reached whereas Slater and Lawrence only consider degradation of upper 3m of permafrost (so the actual area where permafrost is completely lost is probably limited in the transient model, i.e. less than Slater and Lawrence estimate). [Sharon Smith, Canada]	Thanks you have added text to clarify
52646	172	24	172	33	Loss of permafrost may not only be a function of lag to temperature, but it also may result in a tipping point as a function of long-term accumulation of thermal inertia in the soils (see Chasmer and Hopkinson, 2016). So positing that 1.5oC world will save 2 million km2 of permafrost is not necessarily going to be the case. Once again, we should refrain from using the word 'save' in this context rather than presenting it as a comparative. The more important comparative, however, still remains the pre-industrial baseline or current status. [Charlotte Roehm, United States of America]	Good point have reworded - LAs have been asked to focus on the difference between 1.5 and 2
34144	172	25	172	33	The numbers here do not match with page 66, lines 29-30, where it is written 21-37% for 1.5C and 35-47% for 2C (?). The empirical relation here is used to projection until 2300, while the work presented before was using 2100 as a date. Again the numbers of decrease of permafrost are not consistent with the previous mentioned, and here we could save 2 million km2, while before it was 4 millions. It also states that this is a «likely range», while before the confident level was set «medium confidence». Please consider to clarify the difference between these wordings and numbers. [Norway]	Material from 3.3 has been removed and numbers in 3.6 checked again - they are correct
36042	172	25	172	33	The following to be added - Permafrost is a reservoir of mercury in addition to CO2 and CH4. Schuster et al. 2018 have shown that Northern Hemisphere permafrost soils contain almost twice as much mercury as all other soils, ocean and atmosphere combined. As permafrost thaws by the end of 21st century under the influence of increasing tempertures, there is a risk of release of this mercury, thus affecting the global Hg cycle and human health. [India]	Useful, however the intent here is to focus on climate-related aspects of permafrost
46848	172	26	172	26	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Checked
9408	172	29	172	33	Do you mean temperature stabilization at 2300 but changes in permafrost would extend past 2300? [Sharon Smith, Canada]	Yes, Chadburn say eventually. Have added
46850	172	31	172	31	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Checked
12168	172	32	172	32	Inconsistency again with amount of permafrost saved - is it 2 or 4 million km^2? [United Kingdom (of Great Britain and Northern Ireland)]	Rejected. 2 millions according to Chadburn
6384	172	36			Section 3.7 on knowledge gaps (same comment for sections on knowledge gaps in the other chapters of the report): it would seem useful to move these sections on knowledge gaps up front in the chapters of the report, as they contain important caveats regarding the extent to which the special report can answer the 1.5 issues accurately. [Anne Olhoff, Denmark]	Rejected. Section was kept at the end of chapter. References to available information is made in each section.
7332	172	36	172	36	typo - should be 'Knowledge' [Chantal Donnelly, Australia]	Typo was corrected.
10036	172	36	175	1	Section 3.7: Add to the list of knowledge gaps lack of quantitative literature on avoided impacts at the global level and lack of literature on cost of adaptation for 1.5c compared to 2c. In addition these limitations and knowledge gaps should also be reflected in the SPM messages from the chapter so that policy makers may correctly interpret the report findings. [Saudi Arabia]	Accepted - this is part of the information covered by CH4
18522	172	36			Section 3.7 on knowledge gaps (same comment for sections on knowledge gaps in the other chapters of the report): it would seem useful to move these sections on knowledge gaps up front in the chapters of the report, as they contain important caveats regarding the extent to which the special report can answer the 1.5 issues accurately. [Andrea TILCHE, Belgium]	Rejected. Section was kept at the end of chapter. References to available information is made in each section.
47094	172	36	173		Avoid policy prescriptive language like should / must / need. Rather than state an additional resource is needed, perhaps state the improvements that would come from having these additional resources. [Sarah Connors, France]	Agreed, text was revised.
58526	172	36	172	36	Typo in section heading 3.7 [Paul Leahy, Ireland]	Typo was corrected.
7334	172	38	173	35	What about differences in results depending on downscaling and bias-adjustement methodologies, differences from differnent hydrological models. The problem that global hydrological models (GHMs) regularly underperform compared to local or regional hydrological modeles (RHMs) and predict different impacts - i.e. is it relevant to project hydrological changes from GHMs? What about the need to consider landsurface/vegetation feedbacks including CO2 uptake of plants and the effect on evapotranspiration? What about limitations in the transient method of defining 1.5 or 2C? [Chantal Donnelly, Australia]	Thank you. Your suggestions are very important but 3.7 addressed more overarching gaps.
10454	172	44	172	44	You can refer here to Frieler et al. 2017 which is the basis for many comprehensive 1.5 vs 2 °C impact studies Frieler K, S Lange, F Piontek, CPO Reyer, J Schewe, L Warszawski, F Zhao, L Chini, S Denvil, K Emanuel, T Geiger, K Halladay, G Hurtt, M Mengel, D Murakami, S Ostberg, A Popp, R Riva, M Stevanovic, T Suzuki, J Volkholz, E Burke, P Ciais, K Ebi, TD Eddy, J Elliott, E Galbraith, SN Gosling, F Hattermann, T Hickler, J Hinkel, C Hof, V Huber, J Jägermeyr, V Krysanova, R Marcé, H Müller Schmied, I Mouratiadou, D Pierson, DP Tittensor, R Vautard, M van Vliet, MF Biber, RA Betts, B Bodirsky, D Deryng, S Frolking, CD Jones, HK Lotze, H Lotze-Campen, R Sahapal, K Thonicke, H Tian, Y Yamagata (2017) Assessing the impacts of 1.5°C global warming - simulation protocol of the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP2b). Geoscientific Model Development. 10, 4321–4345 doi.org/10.5194/gmd-10-4321-2017 [Christopher Reyer, Germany]	The section was revised and Frieler was cited in 3.2.
14092	172	47	172	48	We need more data on how human coping mechanisms to climate impacts are impacting biodiversity [Nikhil Advani, United States of America]	Accepted - related knowledge gaps have been listed
46342	172	47	173	37	I would definitely add "Conflict" and "Migration" as research gaps. They are certainly as important as "Tourism" which is mentioned in the table. [Etienne Piguet, Switzerland]	Accepted. Included.
9578	173		175		Table 3.9 - Why are the knowledge gaps all focused on natural impacts and not impacts on human populations when this chapter title indicates that it addresses both? Also - Understanding in the table is missing an 'n'. [Joanna Petrasek MacDonald, Canada]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
10456	173	2	173	2	You could add here that these long-term stabilization runs are crucial to aaassess the impacts of time-lagged processes such aas sea-level rise and vegetation compositional changes [Christopher Reyer, Germany]	Not applicable - This section was rewritten.
22458	173	5			If the report is targeted to reach a wide range of pubic and from different countries (not all of them English native), I think that "from background noise" is much more understandable that the current "amidst background noise" [LUIS VALDES, Spain]	Agreed, text was revised.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61942	173	21	173	38	The goal of the final sections is not to be prescriptive of future research directions (avoid "should") but indicate limits of today's lines of evidence (observations, process understanding, models…). I suggest to remove "areas of more research" also in Table 3.9. The tone of the text in table 3.9 is very familiar and not rigorous enough. The table does not flag progress since the AR5 : which conclusions of the AR5 are reinforced (on knowledge gaps)? Which conclusions of AR5 have been challenged (more gaps)? Which new research gaps have been identified here? My understanding is that Table 3.9 lists what assessments could not be achieved, sometimes because literature on specific aspects was not available, sometimes because there is deep uncertainty. Some hierarchy of these items may be valuable. [Valérie Masson-Delmotte, France]	Section was revised (including prescriptive language), the table was deleted and 3.7 addressed now more overarching knowledge gaps.
6060	173	27	173	32	This bullet point is probably the most important weakness of all.More information on these uncertainties could transform some of the risk estimates. As such, this might be put up front, ahead of some of the more subtle, method-related issues. [Timothy Carter, Finland]	The section was revised and a new subsection 3.7.1 was introduced to address gaps in methods and tools
31086	173	34	175		Table 3,9 - virtually all the identified gaps relate to the need for more natural science research. Yet the biggest gap in the chapter is an absence of understanding of how climate change interacts with human systems: i.e. what makes human systems vulnerable, resilient, and how adaptation takes place. this needs to be central to the research gaps. [James FORD, Canada]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
670	173	37	173		In agreement with my comment on P160, Table 3.9 should include peatlands as "an area for greater understanding and more research" [Maria Jesus Iglesias Briones, Spain]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
16422	173	37			Table 3.9 has a significant category error and omissions. The Sea ice category should not include the future of the Antarctic ice sheet. Under sea ice, the understanding of change in the Antarctic and the ability to project future sea ice change with greater confidence is arguably the biggest gap. To this, there is a gap in ability to describe *regional* sea ice changes accurately. In the Antarctic, aggregate circumpolar averages mask what are very large regional changes. There is no mention of a high level category for Ice Sheets, which would then include the Antarctic ice sheet future - the ability to predict future rapid change, either from the marine ice instability or related new processes identified by DeConto and Pollards modelling (hydrofracture and cliff failure). *Crucially* for this report, the ability to identify where thresholds lie for commitment to rapid or unstable loss of ice. The state and future of the Greenland ice sheet is still a gap, although smaller, while the future stability and thresholds for East Antarctica is a big gap. There is no mention of ocean changes as these pertain to the ice sheet - attributing and predicting change in heat flux to the ice shelves of Antarctic is a critical gap. [Australia]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
314	173	38	173	38	Section 3.3 - Drought: "Period" needed at end of sentence. [Paul Doyle, Canada]	Not applicable - This section was rewritten
3850	173	38			Sea level: insufficient! Because we still have issues with ice sheets! [Olaf Eisen, Germany]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
6386	173	38			The table: could more information regarding regional dimensions of these knowledge gaps be included? [Anne Olhoff, Denmark]	Text was revised. Regional dimensions are included in the section.
16424	173	38	173	38	Need to add further dot points, including such enquiring about “Polynyas, leads and open water within the sea-ice zone”, “Marginal Ice Zone processes” and “Persistence of fast ice and its role in constraining glacial ice tongues and ice sheets”. [Australia]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
16426	173	38	173	38	The following is wrongly shown under “sea ice”: “The future of the Antarctic ice sheet in predictions of global sea level.” and needs to be moved to the entries for “sea level”. [Australia]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
17656	173	38	173	38	In Table 3.9, under section 3.3, please replace “storms and hurricanes” by “storms and tropical cyclones” to align with the title of section 3.3.7. Also, please consider rephrasing “Changes in storm intensity and frequency as a function of climate…..” as “Changes in storm intensity, frequency, prevailing tracks and precipitation as a function of climate…..”. [Sai Ming Lee, China]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
18524	173	38			The table: could more information regarding regional dimensions of these knowledge gaps be included? [Andrea TILCHE, Belgium]	Text was revised. Regional dimensions are included in the section.
36044	173	38			Table 3.8, Page 163, it is identified that the changes in Asian monsoon under 1.5 and 2 degree scenario needs more research. This should be included in knowledge gap area in Table 3.9 [India]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
37150	173	38	173	38	uderstanding' also recurs in several other locations [John Sweeney, Ireland]	Typo was corrected.
662	174		174		Another example of how terrestrial ecosystems do not get the same detail as the marine ones. All points mentioned in the ocean systems could be inserted in the terrestrial ecosystems. In the text on terrestrial ecosystems there is no a single mention to acidification, foodwebs, interaction between stressors, etc. which could also have impact on human populations that depend on them. [Maria Jesus Iglesias Briones, Spain]	Not applicable - This section was rewritten.
7212	174		175		Why such little information on human systems, incl. poverty? [Petra Tschakert, Australia]	The section was revised and more information were included.
7880	174				Table 3.9, part "Ocean systems": The response of ocean currents to climate change is not limited to changes of thermohaline circulation. Projected changes of wind-driven currents are equally or even more important. The decline of oxygen in the ocean is actually questionable - while it is likely to be so at many locations, this process is not steady. Ocean acidification may threaten coral reefs and other calcifiers, but is unlikely to significantly affect the ionic composition of seawater. [Petr Zavialov, Russian Federation]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
8914	174		174		Predicting the risk associated to extreme eventsand anticipating their' should be 'Predicting the risk associated with extreme events and anticipating their' [Robert Shapiro, United States of America]	Not applicable - This section was rewritten
10458	174				table on terrestrial ecosystems should refer to "CO2 fertilization" and one more item could be the interaction of changes in productivity and chnages in disturbance regimes in forests which we only start to understand, see Reyer CPO, S Bathgate, K Blennow, JG Borges, H Bugmann, S Delzon, SP Faias, J Garcia-Gonzalo, B Gardiner, JR Gonzalez-Olabarria, C Gracia, J Guerra Hernández, S Kellomäki, K Kramer, MJ Lexer, M Lindner, E van der Maaten, M Maroschek, B Muys, B Nicoll, M Palahi, JHN Palma, JA Paulo, H Peltola, T Pukkala, W Rammer, D Ray, S Sabaté, MJ Schelhaas, R Seidl, C Temperli, M Tomé, R Yousefpour, NE Zimmermann, M Hanewinkel (2017) Are forest disturbances amplifying or canceling out climate change-induced productivity changes in European forests? Environmental Research Letters [Christopher Reyer, Germany]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
22460	174				Freswhater: it will read better by adding "specially between global warming of 1.5ºC and 2ºC" at the end [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22462	174				Terrestrial ecosystems, 6th bullet point: insert space between "eventand" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22464	174				Ocean systems, 4th bullet point: remove double comma in "e.g.,," [LUIS VALDES, Spain]	Not applicable - This section was rewritten
22466	174				SIDS, 1st bullet point: replace "are at too coarse a temporal" by "are too coarse at temporal" [LUIS VALDES, Spain]	Not applicable - This section was rewritten
46852	174		174		Under Terrestrial ecosystems & ocean ecosystems: Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Not applicable - This section was rewritten.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
18526	174	1	174	1	Broaden cell on small islands to cover low lying islands, coasts and communities. Challenges indicated in terms of knowledge gaps are not specific to SIDS. [Andrea TILCHE, Belgium]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
36046	174	1	174	3	Replace 'uderstanding' with 'understanding' [India]	Typo was corrected.
315	174	38	174	38	Section 3.4 - Terrestial ecosystems - second bullet: .....support this: in the field..... [Paul Doyle, Canada]	Not applicable - This section was rewritten
22468	175				Shouldn't this box be part of chapter 2 instead of chapter 3? [LUIS VALDES, Spain]	The table was deleted and content revised. 3.7 addressed now more overarching knowledge gaps.
7254	175	1	175	1	In the last row of Table 3.9, "Tourism", I suggest adding a note indicating the absence of regional-wide scientific studies addressing the impact of future climate change on operating conditions of ski resorts accounting for snowmaking and other snow management options. This is clearly a knowledge gap, which explains why the section on tourism is so inconclusive regarding 1.5 vs 2°C impacts (and beyond), and which fuels considerable over-simplifications by the media, some policy-makers, and some members of the scientific community on this de facto prominent topic. [Samuel MORIN, France]	Not applicable. Table was deleted.
22470	175	1		8	I think this introductory paragraph read as a tautology, a circular thought. Simplify it or remove it. [LUIS VALDES, Spain]	Accepted - Text was revised
36048	175	1			Replace 'uderstanding' with 'understanding' [India]	Typo was corrected.
61944	175	1	179	5	The box is very long, and repeats aspects present in various chapters. My understanding is that a box is not intended to repeat an assessment, so move here the short, sharp elements coming from across chapters. The box needs to be written in a more harmonised style (it reads as a copy and paste of various elements, without an overall narrative). The part of the assessment related to biodiversity and ecosystem preservation is quite weak. The last paragraph of text does not build on the assessment of any literature, please improve this. [Valérie Masson-Delmotte, France]	The box on land use change has been completely rewritten in consultation with other LA.
36668	175	3	179	7	In the Cross Chapter Box: I think it's important to point out the ESMs should also be used to evaluate the potential biogeochemical impacts of land-based mitigation strategies like BECCS and afforestation/reforestation. In this way we can investigate the potential earth system impacts of a mitigation strategy and test their effectiveness (e.g. Krause et al. 2017; Boysen et al. 2017: "The limits to global-warming mitigaiton by terrestrial carbon removal" doi:10.1002/2016EF000469; Harper et al. in review). For example, Harper et al. showed that certain mitigation options that appear to work in an IAM might not make sense when tested in an ESM modelling framework. That study used offline dynamic global vegetation model forced with climate change patterns from 34 CMIP5 GCMs and tested the impact of the land-use patterns in the IMAGE 1.9 scenario. They found a net loss of land carbon, even after considering the carbon sequestration potential from BECCS due to the land-use change emissions. Therefore IAM assumptions about the effectiveness of BECCS or afforestation/reforestation need to be scrutinized. Ref: Harper et al. (accepted pending revisions at Nature Communications: "Relative effectiveness of land-based mitigation strategies in stablising climate change at 1.5C") [Anna Harper, United Kingdom (of Great Britain and Northern Ireland)]	We agree, two of these citations are now discussed in the Box. Thank you for highlighting their significance.
38696	175	3	179	5	A reference could me made to the coming SRCCL. [Jan Fuglestvedt, Norway]	Accepted, done
3652	175	5	179	5	Cross-chapter box 3.1 is interesting but very long. I suggest to keep the essential and make it 2 pages maximum. [David Docquier, Belgium]	The box has been rewritten and shortened.
3658	175	5	179	5	I suggest to use a lighter background color for all boxes of the report, i.e. light blue. [David Docquier, Belgium]	Editorial - copyedit to be complete prior to publication
6388	175	5			Cross-chapter box 3.1: very interesting and relevant box, but not clear why it is in chapter 3 rather than in chapter 2 (or even 4). [Anne Olhoff, Denmark]	This was agreed in Plenary : it is related to the section on potential risks associated with land use issues.
16428	175	5	179	5	Negative emissions - why this this box in this chapter? [Australia]	This was agreed in Plenary : it is related to the section on potential risks associated with land use issues.
18528	175	5			Cross-chapter box 3.1: very interesting and relevant box, but not clear why it is in chapter 3 rather than in chapter 2 (or even 4). [Andrea TILCHE, Belgium]	This was agreed in Plenary : it is related to the section on potential risks associated with land use issues.
3644	175	7			Do you need to mention the authors of this cross-chapter box? [David Docquier, Belgium]	Authors are mentioned after title
24250	175	13	175	13	1.5C", missing degree sign [Nazan AN, Turkey]	Not applicable - This text was deleted
38694	175	16	175	16	Such a precision is not justified; so I suggest changing the number to approx 25% or 1/4. May also mention that this is based on GWPs from the Second Assessment Report. [Jan Fuglestvedt, Norway]	Reworded
42802	175	23	175	27	Because of the prolific use of BECCS and afforestation to achieve 1.5ºC in the scenarios, policies would need to reflect a dedication to making these a reality. [Kristin Campbell, United States of America]	The box has been reworded to explain the difficulties of scaling up these approaches
43048	175	23	175	27	Bioenergy is not carbon neutral, especially in the 10–15 year window before positive feedbacks risk locking in dangerous warming, and CCS is not yet technologically mature, nor socially acceptable. Additional barriers to BECCS implementation include a need for internationally agreed upon carbon accounting for instances where the bioenergy is harvested in one country, used in another, and then stored in a third (Peters and Geden 2017, Catalysing a political shift from low to negative carbon). See Booth M. S. (2018) “Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy”, Envtl. Research Letters; and Sterman et al (2018) “Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy”, Envtl. Research Letters. [Durwood Zaelke, United States of America]	We agree, Booth (2018) is now cited in both section 3.6.2.1 and the Box. Thank you for drawing our attention to this paper.
3648	175	25			Check brackets. [David Docquier, Belgium]	Not applicable - This text was rewritten
22472	175	25			add "year" in citations or delete the references [LUIS VALDES, Spain]	Accepted - References were edited
3650	175	26			I would not use the acronym CDR for carbon dioxide removal since one can confuse with climate data record. [David Docquier, Belgium]	Acronym clearly defined within Box
49270	175	26	175	27	What about reforestation? How is this included? [Bill Hare, Germany]	This is now included
22474	175	33			Replace "submitted" by publication year. Otherwise remove (submitted papers are not accessible and therefore not adequate for a science policy interface report, such as IPCC reports) [LUIS VALDES, Spain]	Not applicable - This text was deleted
49272	175	35	175	42	This reference to the UNFCCC seems beyond the scope of the IPCC. It is up to policy makers to interpret the objective of the UNFCCC, not the IPCC [Bill Hare, Germany]	Agree, deleted
56044	175	43	175	43	Second-generation biofuels are mentioned in here, but they are not a CDR strategy. Second generation biofuels are advocated for as low carbon or sometimes even carbon netural, but they are not CDR as they do not remove additional carbon from the atmosphere. [Kelly Stone, United States of America]	The box has been reworded to focus on CDR

Comment No	From Page	From Line	To Page	To Line	Comment	Response
56046	175	43	176	2	It is unclear how this example is supporting the above statement that CDR strategies can be planned in a way that doesn't conflict with rights.It needs to be stated more clearly. First, some CDR strategies are not landbased, such as DAC. There are also land-based strategies which proponents claim will be less of a threat to rights and sustainable development, such as biochar, marginal lands, restoration, second generation biofuels etc. [Kelly Stone, United States of America]	We appreciate these considerations, but decided that Ch 3 is not the right place to discuss these issues, which belong in Ch 5. We reworded the box and mentioned that issues related to governance and land use will be examined in detail in the SRCCL
56048	175	43	176	2	Marginal lands are a myth [Kelly Stone, United States of America]	The box has now been rewritten and marginal land is no longer mentioned
56050	175	43	176	2	Scale is an important factor in risk here that is not mentioned. While all land use presents some risk, large scale removals create more pressure for additional and riskier types of CDR. [Kelly Stone, United States of America]	The box has been rewritten and scale is now an important focus
53994	175	43	176	2	Although we agree that these may be policies and proposals, such as reforestation with native trees, careful ecosystem restoration and massive support for peasant agroecology that can minimise the conflicts, the example of technologies mentioned are untested, unproven and potentially extremely dangerous technologies. Second-generation biofuels imply the use of synthetic biology and new biotechnologies that carry a whole new set of uncertainties (Ref: ETC Group, http://www.etcgroup.org/content/outsmarting-nature/report). The use of "marginal lands" is a myth, as there are basically no marginal lands that are not used by peasants and/or indigenous peoples or do not have important ecological functions (Ref: Econexus: https://www.cbd.int/doc/biofuel/Econexus%20Briefing%20AgrofuelsMarginalMyth.pdf) , Biochar is also a contested technology that could generate more CO2 emissions (Ref: http://www.biofuelwatch.org.uk/docs/biocharbriefing.pdf). DAC´s cost and energy demand is prohibitive as alternative: (Ref: https://sequestration.mit.edu/pdf/ManyaRanjan_Thesis_June2010.pdf). [Elenita Daño, Philippines]	We appreciate these thoughts, actually the whole box has been rewritten and due to space constraints issues related to governance of land use (e.g. relating to indigenous people) have had to be deferred for detailed discussion in the SRCCL. There is not room here for a detailed discussion on biochar, which is discussed in more detail in Ch 4, section 4.3.7.3
49274	175	44	175	44	Should explain what "land based NETs" are… and provide references for statements [Bill Hare, Germany]	Not applicable - This text was deleted
51040	176	4	176	8	See comments 16 and 17 above. Box should include discussion of Dooley and Kartha, citation in comment 8 above. [Doreen Stabinsky, United States of America]	This paper is discussed in Ch 2, section 2.3.4
49276	176	7	176	18	I don't find this section very clear. It is not clear to the reader that these scenarios only demonstrate trade-offs, and that that there may be other options that can achieve a certain volume of NETs without having to rely solely on BECCS. [Bill Hare, Germany]	The whole box has been rewritten to improve structure and clarity
22476	176	10		28	add "year" in citations or delete the references (many cases in these lines) [LUIS VALDES, Spain]	Accepted - References were edited
36050	176	29	176	30	Reference year to be added for Rogelj et al [India]	Not applicable - This text was deleted
50500	176	32	176	34	Consider including the more recent results on this calculated by Boysen, Lucht, Gerten et al. 2017 (Earth's Future) and Yamagata et al. 2018 (Sustainability Science), also with view to ecosystems and biodiversity [Ina Möller, Sweden]	Thankyou, these are now cited in section 3.6.2.1 (which was felt to be more appropriate than including this in the Box)
24252	176	33	176	33	(food security, biodiversity, ...) it should be shown "e.g" [Nazan AN, Turkey]	Not applicable - This text was rewritten
24254	176	35	176	35	missing table caption and check the headings of the figure (shifting etc.) [Nazan AN, Turkey]	Accepted - Table caption was added
32682	176	35	177	1	Is it possible to add the median values for the potentials in Table 1? [Jasmin Kemper, United Kingdom (of Great Britain and Northern Ireland)]	Rejected
41644	176	35			Change "$ per tCO2" to "USD tCO2-1" [Czech Republic]	Rejected
53996	176	35			The comments above also apply to the box. All options considered in the box do not take into account all the spectrum of the main impacts which is supposed to be the focus of the chapter. Besides the described impacts, Enhaced Weathering carry large impacts on land caused by the need for massive mining of olivine or other subtances. [Elenita Daño, Philippines]	The effects of enhanced weathering are now mentioned in the Box
8916	177	6	177	6	Not that other' should be 'Note that other' [Robert Shapiro, United States of America]	Not applicable - This text was deleted
50502	177	10	177	25	It is not clear how this paragraph follows from the previous paragraph. Increases of up to 0.1 what? (Missing unit in line 10). Also, in the last sentences (line 22), the potential of 'what' is more than 30% higher than prior estimates, and note (b) could be formulated in a clearer manner. Do these notes refer to Griscom et al. 2017? If yes, discussing this reference without including it in the table seems a bit odd. [Ina Möller, Sweden]	The whole box and section has been rewritten in consultation with LA in Ch 4. The references to Griscom et al are now covered in chapter 4.
55668	177	10	177	25	[Griscom et al (2017)] estiamte is not included. Just because ecosystem/land-based mitigation and ecosystem/land-based CDR, are (of necessity) overalpping categories, does not give a good reason to exclude them from the analysis here! Griscom et al actually disagregate avoided emissions from CDR so it is possible to include them in Table 1. [David Cooper, Canada]	The whole box and section has been rewritten in consultation with LA in Ch 4. The references to Griscom et al are now covered in chapter 4.
54446	177	21	177	25	Suggest changing wording regarding cost-effectiveness of restoration appraoches to reflect the large uncertainty expressed in Griscom et al (2017). In particular, wording such as "more than a third of cost-effective CO2 mitigation needed through 2030" needs to be modified to ensure the limitations of the economic modelling pursued in this study are clear (e.g. starting at $100/ton CO2 immediately in a world with substantially lower carbon prices, the lack of available marginal abatement curves, preferentially scaling up such options while delaying energy-based mitigation). In addition it should be clarified that saturation effects limit the potential of such approaches to much lower than 1/3 in the longer term (Griscom estimates 12% by 2050 at a similar $100/ton cost-effectiveness cut-off). Finally, a reference to the problem of potential impermanence of sequestration options shoudl be added to this section, with reference to Cross-chapter Box 3.1. [Christopher Weber, United States of America]	The whole box and section has been rewritten in consultation with LA in Ch 4. The references to Griscom et al are now covered in chapter 4. Space prevents a detailed discussion of the issue raised here which should be explored in more detail in the special report on land.
47096	177	23	177	23	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Text edited
49278	177	23	177	25	From Griscom et al, this states that >1/3 of "cost effective" mitigation needed for >66% of holding warming to below 2 deg can be met with natural options, but this does not highlight the high uncertainties or the meaning of "cost effective" [Bill Hare, Germany]	The whole box and section has been rewritten in consultation with LA in Ch 4. The references to Griscom et al are now covered in chapter 4.
22478	177	41			add "year" in citations or delete reference [LUIS VALDES, Spain]	Not applicable - This text was deleted
22480	178	7			add "year" in citations or delete the references [LUIS VALDES, Spain]	Not applicable - This text was deleted
39196	178	9	179	5	These points should have a summary highlight, as they raise critical points that are not fully shared in the opening summary. For example, highlight in summary what you have on this page: "Conclude When mitigating in an effort to constrain warming to 1.5C, to avoid negative impacts on agriculture, ecosystems and sustainable development, it is essential for mitigation to be designed to minimize the land use footprint." [Lindsey Cook, Germany]	Accepted-key messages were added
42804	178	10	178	31	There are concerns about the planetary limits (i.e. freshwater use) and the available land space for the biomass used for BECCS. Heck et al 2018. [Kristin Campbell, United States of America]	Noted. Heck is mentioned in Cross-chapter box 7.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
43050	178	10	178	31	There are concerns about the planetary limits (i.e. freshwater use) and the available land space for the biomass used for BECCS. Heck et al 2018; Booth M. S. (2018) "Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy", Envtl. Research Letters; and Sterman et al (2018) "Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy", Envtl. Research Letters. [Durwood Zaelke, United States of America]	Noted. Heck is mentioned in Cross-chapter box 7.
47098	178	28	178	31	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Noted. Prescriptive language was avoided.
22482	178	30		31	Replace "submitted" by publication year. Otherwise remove (submitted papers are not accessible and therefore not adequate for a science policy interface report, such as IPCC reports) [LUIS VALDES, Spain]	Not applicable - This text was deleted
13960	178	35	178	42	What isn't in the IAMs: the IAMs also underestimate the current rates of tropical deforestation, so it is not clear that the IAMs can project land use conversion in the future. Mahowald, N. M., Ward, D. S., Doney, S. C., Hess, P. G., & Randerson, J. T. (2017). Are the impacts of land use on warming underestimated in climate policy? Environmental Research Letters, 12(9). https://doi.org/10.1088/1748-9326/aa836d [Natalie MAHOWALD, United States of America]	Noted. This article is mentioned in Section 3.6.2.1
22484	178	41			Remove double comma in "e.g.,," correct the brackets [LUIS VALDES, Spain]	Not applicable - This text was rewritten
53998	178	41	178	42	Delete example on Enhaced Weathering for the same reasons as above. [Elenita Daño, Philippines]	Rejected. This is mentioned in the literature and should be reflected in our assessment. However, the topic is not addressed in detail in the chapter.
54000	178	45			The package of "Climate smart agriculture" includes the heavy use of fertilizers and biotech crops that increase the use of agrochemicals, both heavy factors for global warming and climate change. See: https://www.grain.org/article/entries/5270-the-exxons-of-agriculture. Delete all references to "climate smart agriculture" and keep reference to sustainable agriculture. [Elenita Daño, Philippines]	Noted. "Climate smart agriculture" is now not mentioned in the chapter.
22486	178	48			The sentence "Poorly implemented mitigation interventions could lead to trade offs and adverse side-effects for some sustainability dimensions" is an important message, I wonder if it could be printed in bold. [LUIS VALDES, Spain]	Not applicable - This text was rewritten
6390	179	10			Cross-chapter box 3.2: also highly interesting and relevant box. However, it is very long and may be more suitable for a different format than a box. [Anne Olhoff, Denmark]	Noted. Thanks for highlighting that this box is interesting and relevant. We have shortened the text a bit (e.g. Table 1, and some of the text). A cross-chapter box was considered a suitable format for coordination with contributions from other chapters.
18530	179	10			Cross-chapter box 3.2: also highly interesting and relevant box. However, it is very long and may be more suitable for a different format than a box. [Andrea TILCHE, Belgium]	Noted. Thanks for highlighting that this box is interesting and relevant. We have shortened the text a bit (e.g. Table 1, and some of the text). A cross-chapter box was considered a suitable format for coordination with contributions from other chapters.
52650	179	10	187	1	Would strongly suggest moving this whole section to the beginning of the chapter. It is a summative overview of the current situation and sets up the chapter sections very well. The scenario based story lines provide optimism (in some cases) and provoke thoughts and ideas about necessary mitigation strategies as the reader works through the rest of the chapter. [Charlotte Roehm, United States of America]	Noted. Could consider to include the cross-chapter box earlier in the chapter prior to publication, e.g. at the end of Section 3.2.
3662	179	12	187	1	All figures and tables of this cross-chapter box are interesting but I am wondering if the text in 'Detail' is really necessary. I would keep it to the very essential. The storylines are very interesting. [David Docquier, Belgium]	Noted. The headline of the text section was changed to "Key questions", and this text was shortened.
6062	179	12	179	12	This is a very large Box and contains important synthesis material that is referenced in the SPM as well as elsewhere in this chapter. I wonder if it is too long, and might be broken up into smaller parts. These parts could then be placed strategically in the text where the relevant issues are raised. [Timothy Carter, Finland]	Noted. We have shortened the text a bit (e.g. Table 1, and some of the text). A cross-chapter box was considered a suitable format for coordination with contributions from other chapters.
38698	179	12	187	1	There is some overlap between this box and ch1. I think this overlap could be reduced so it more efficiently builds on ch1. [Jan Fuglestvedt, Norway]	Accepted. Some of the text was shortened, more references to chapter 1 were added.
60640	179	12	180	17	The material here is more suitable for an introduction and should therefore be moved to the appropriate place near the beginning of the chapter, or the text from this box could be integrated into introductory material. [United States of America]	Noted. Could consider to include the cross-chapter box earlier in the chapter prior to publication, e.g. at the end of Section 3.2.
13864	179	12	187	1	Re: Cross Chapter box 3.2. As this entire report is at the request of the COP21 Paris Agreement, some discussion of the likelihood of achieving 1.5 and 2C targets, or even stabilization at any level, given the INDCs committed to at Paris should be included. This subject is discussed in chapter 14 of the recent 4th US National Climate Assessment, Volume 1. https://science2017.globalchange.gov/chapter/14/ . That report finds that under the INDCs, the probability of stabilizing at 2C is 8% and "there would be virtually no chance if emissions climbed to levels above those implied by country announcements". It also finds no chance of stabilizing at 1.5C with the INDCs. If emissions were furtherreduced to Paris aspirations, it is still likely that 2C would be exceeded according to figure 14.2 of US NCA4v1. (1.5C would very likely be exceeded in this case). Given the motivations behind the very existence of this report, it is critically important that the COP21 policymakers understand the difficulties of achieving such aggressive stabilization targets. See also Fawcett, et al. 2015: Can Paris pledges avert severe climate change? Science, 350, 1168–1169, doi:10.1126/science.aad5761. [Michael Wehner, United States of America]	Noted. Too detailed for this box, which is already at the limit in terms of length. But will consider whether highlighted references should be considered for addition in the Annex prior to publication.
60638	179	12	187	50	Regarding Cross-Chapter Box 3.2, as this entire report is at the request of the COP21 Paris Agreement, some discussion of the likelihood of achieving 1.5 and 2°C targets, or even stabilization at any level, given the committed INDCs should be included. This subject is discussed in Chapter 14 of the recent U.S. Fourth National Climate Assessment, Volume 1, https://science2017.globalchange.gov/chapter/14/. That report finds that, under the INDCs, the probability of stabilizing at 2°C is 8% and "there would be virtually no chance if emissions climbed to levels above those implied by country announcements". It also finds no chance of stabilizing at 1.5°C with the INDCs. If emissions were further reduced to Paris aspirations, it is still likely that 2°C would be exceeded according to Figure 14.2 (1.5°C would very likely be exceeded in this case). Given the motivations behind the very existence of this report, it is critically important that the COP21 policymakers understand the difficulties of achieving such aggressive stabilization targets. See also Fawcett et al., 2015: Can Paris pledges avert severe climate change? Science, 350, 1168-1169, doi:10.1126/science.aad5761. [United States of America]	Noted. Too detailed for this box, which is already at the limit in terms of length. But will consider whether highlighted references should be considered for addition in the Annex prior to publication.
3646	179	13	179	15	Do you need to mention the authors of this cross-chapter box? [David Docquier, Belgium]	Yes. This is the standard format for cross-chapter boxes.
56970	179	23	179	24	Needs addition: …mitigation and adaptation choices, and from different levels of albedo change…" [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Rejected. Changes in albedo would result from different mitigation or adaptation choices (e.g. no-till farming)
12170	179	49	179	50	Not sure if a discussion of this (quite important) point appears at all in chapter 3, add one in or at least make more explicit in main text [United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61946	180	1	187	60	The style of the bold sentences at the start of each paragraph could be harmonized, by using questions for all of them, as for the beginning.There is no reference cited, so please can you link each paragraph of the table to the corresponding subsections of related chapters, for traceability? I suggest to drop the item on SRM already covered in another x chapter box. The implications of non CO2 mitigation for impacts should be assessed in more detail (e.g. air quality, health, crops). Table 1 could also include a range of corresponding atmospheric CO2 concentrations as this is relevant for e.g. ocean acidification impacts. For Table 1, I am concerned about traceability ; could the supplementary online material provide full traceability of the narratives to an assessment of the literature? The links between these narratives of possible futures and the scientific material (SSP scenarios etc) is missing. [Valérie Masson-Delmotte, France]	Accepted for most items. The style was harmonized and almost only includes questions now. We have dropped the material on SRM. Where relevant, references to the underlying chapters have been added, in particular in the storylines. The box also provides some unique assessments not directly building on the chapter, but on other publications which are all cited (e.g. Seneviratne et al. 2018, Millar et al. 2017). We could not add more details on non-CO2 effects of mitigation scenarios for impacts due to space constraint. The material from Table 1 and Table 2 is now fully traceable.
3654	180	8			Replace 'Box 3.1' by 'Cross-Chapter Box 3.2'. [David Docquier, Belgium]	Editorial - copyedit to be completed prior to publication
22488	180	10			remove double comma in "e.g.,," [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
3656	180	13			Remove 'near'. [David Docquier, Belgium]	Sentence was revised
22490	180	14			remove double comma in "e.g.,," [LUIS VALDES, Spain]	Accepted - Text was revised with the suggested edit
5514	181	1	181	7	The caption is not sufficient for me to understand this figure. Is stochastic noise the right term or does this represent climate variability? Is this temperature or is it a change in temperature from pre-industrial? Is this any location, or is it the location shown on the maps? Is yearly maximimum day-time temperature the change in annually-averaged maximum daytime temperature or something else? [Haroon KHESHGI, United States of America]	Noted. The caption was clarified.
52648	181	25	181	36	This message is important and critical and a key component of the report as a whole. It is suggested that this point be emphasized more throughout the report and this chapter, with a reminder that statements that say 1.5oC will result in 'savings' and 'reductions' as compared with 2oC should be avoided. The chapter could benefit from providing emphasis on critical status, but rather than creating an alarmist message, one can counter the critical status with opportunities for mitigation that can be 1. implemented immediately, and 2. need development and implementation in the near future. Outlining and targeting opportunities provides a positive emphasis for people to take action. Part of these opportunities are provided in the summary table of current gaps in knowledge and understanding presented in Table 3.9. [Charlotte Roehm, United States of America]	Noted. This point (relevance of overshooting) is now mentioned in the executive summary.
19638	181	29	181	32	"The implications of overshooting are very important for impacts, especially if the temperature at peak warming is high, because some impacts may be long-lasting and irreversible in the time frame of the current century, for instance sea ice melting and ecosystem mortality (Chapter 3). The chronology of emission pathways and their implied warming is also important for the more slowly evolving parts of the Earth system, such as those associated with sea level rise. " Overall there is very limited and scattered details are given about the impact differences of emissions pathways with or without overshoot. Box 3.2 is a main section for this, but this is still far from any comprehensive overview of the differences in impacts. [Jennifer Morgan, Netherlands]	Noted. Could not add much more material because of lack of publications. However, added publication on impacts of rate of climate warming (Loarie et al. 2009, LoPresti et al. 2015), which is an essential component of the impacts associated with overshooting.
12172	181	31	181	32	Chapter 3 states several times that it seems like summer sea-ice loss could be reversible - be consistent [United Kingdom (of Great Britain and Northern Ireland)]	Noted. We don't mention sea-ice loss anymore.
38700	181	34	181	34	To avoid the ambiguity related to "equiavalent", I suggest that you simply write "remaining emission budget". [Jan Fuglestvedt, Norway]	Accepted. Will be corrected prior to publication.
47100	181	35	181	35	Avoid policy prescriptive language like should / must / need. Replace with alternative terms such as 'would need to', 'could' etc. [Sarah Connors, France]	Accepted - Text was revised with the suggested edit
38702	182	12	182	12	The paper by Millar et al, Nature Geo, 2017, contains adapative scenarios and could be referred to here as an example. [Jan Fuglestvedt, Norway]	Accepted. This article is now cited.
39198	182	14	182	19	Te difference between the two choices given here is that one addresses root causes and one (geo-engineering) does not, thus one addresses the disease while the other address symptoms and the disease continues, in turn making the situation far worse in the long term. If you do not make this clear, you are doing policy makers a great disservice. [Lindsey Cook, Germany]	Rejected. This paragraph is not on geoengineering (note that it mentions "decarbonizing the economy"). Even without considering e.g. sulphate aerosol injections, alternative possible mitigation pathways can have different trade-offs and benefits.
50506	182	16	182	16	The word 'alternatlively' in this sentence suggests an incompatibility of lifestyle change and technological solutions, which is misleading. In the end, it is most likely to be a mix. Upholding the 'either or' assumption will only reinforce already deep trenches between those who believe in systemic change and those who believe in the power of technology. At this point in time, we have no space to argue over which approach is better and rather need to focus on doing everything we can [Ina Möller, Sweden]	Accepted. This will be corrected prior to publication. Will write ".... a) with an emphasis on demand reduction and sustainable lifestyles, or b) with an emphasis on large-scale solutions ... , or c) combinations of both.
1028	182	36	182	45	This paragraph does not answer the question, which is "Yes, modeling evidence consistently indicates that RMMs could reduce climate change anomalies (both temperature and precipitation) at the regional scale. However, there are limitations and risks…" [Jesse Reynolds, Netherlands]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
7336	182	36	182	38	SRM could not only reduce the global mean temperature but also ameliorated some of the temperature-related impacts. Moreover, SRM could contribute to sustainable development, depending on the governance arrangement and the deployment scale. [Masahiro Sugiyama, Japan]	Not applicable - This text was deleted because SRM is addressed in chapter 4.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
37456	182	36	182	45	This paragraph does not answer the question, which is "Yes, modeling evidence consistently indicates that RMMs could reduce climate change anomalies (both temperature and precipitation) at the regional scale if deployed to partially compensate for a limited amount of warming; however, there are limitations and risks…" (Jones et al., 2018; MacMartin et al., 2018; Irvine et al., 2010; Ricke et al., 2010). References: MacMartin, D. G., Ricke, K. L. & D. W. Keith (2018). Solar Geoengineering as part of an overall strategy for meeting the 1.5°C Paris target. Forthcoming in Phil. Trans. Royal Soc. A. doi:10.1098/rsta.2016.0454 Jones, A., Hawcroft, M., Haywood, J., Jones, A., Guo, X., & Moore, J. (2018). Regional climate impacts of stabilizing global warming at 1.5 K using solar geoengineering. Earth's Future. Irvine, P. J., Ridgwell A., & Lunt D. J. (2010). Assessing the regional disparities in geoengineering impacts. Geophysical Research Letters, 37(18). Ricke, K. L., M. G. Morgan, & M. R. Allen (2010). Regional climate response to solar-radiation management, Nat. Geosci., 3(8), 537–541. [Matthias Honegger, Germany]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
41706	182	36	182	45	The first thing that this paragraph should do is answer the question! Then it should come to the implications. And the answer to the question is "If SRM could be made to work physically and sociopolitically within an appropriate time frame then there is a very high level of confidence that it would be able to limit global warming to 1.5C" [Andrew Parker, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
50508	182	36	182	45	SRM, as described in this paragraph, refers (I take it) mainly to stratospheric aerosol injection. Apart from creating winners and losers, deployment in the global commons such as the stratosphere (or the lower atmosphere, as in the case of marine cloud brightening) would also entail the need for global coordination and regulation due to transboundary effects. [Ina Möller, Sweden]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
56972	182	36	182	38	The use of "but" in this sentence produces a false sense of contrast, and the "entirely" is unnecessary. Prefer: "Using SRM to modify the global temperature would create a novel global and regional climate." [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
57012	182	36	182	36	The answer to this question is clearly yes, and the text should reflect this. There should then be caveats as to the problems which such a contribution could raise. [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
41708	182	37	182	38	The statement that SRM use would create an 'entirely new climate' is quite misleading. Earth is heading to a new climate whatever happens, because of increased atmospheric GHG levels. The question is whether the climate from the use of SRM would be more or less novel than the climate from passing 1,5C. Research on this is pretty clear: for major climatic variables like temp and hydrology, use of SRM to hold global temps at 1.5C would create a *much* less different climate to a world where the temperature rises above 1.5C and beyond. See forthcoming paper by MacMartin et al (2018) Phil Trans A [Andrew Parker, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
37272	182	38	182	40	This paragraph discusses SRM implementation schemes as varying only in amount (full vs. moderate implementation). However, there are active studies of not just the amount, but also the location, timing, and temporal variations of SRM that could be targeted to achieve climate objectives. In these cases, the negative impacts mentioned are hardly certain, and often shown to be possible to mitigate by choosing the appropriate implementation schemes. [MacMartin, Douglas G., David W. Keith, Ben Kravitz, and Ken Caldeira. 2012. "Management of Trade-Offs in Geoengineering through Optimal Choice of Non-Uniform Radiative Forcing." Nature Climate Change 3 (4): 365–68. https://doi.org/10.1038/nclimate1722] [Joshua Horton, United States of America]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
41710	182	38	182	40	It is not clear what is meant here by 'full deployment' and I don't think this is a concept that enjoys wide use or shared understanding. I am assuming that what is meant here is SRM deployment to plunge temperatures back to pre-industrial levels. If so then that should be made explicit. However, even in these cases, models have found reduced disruptions to total system moisture because evaporation reduces alongside precipitation. [Andrew Parker, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
56974	182	38	182	40	full deployment is not defined, and seems oddly normative. I assume it to mean achieving the temperature goal in the absence of any mitigation efforts--ie achieving a negative forcing equal to the positive forcing of the greenhouse gases in terms of W/m^2. If so that is what should be said. (It might also be noted that this is not a mode of deployment people discussing such things take as in any way the norm, or desirable.) [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
41712	182	39	182	40	To claim that moderate use of SRM would merely have "less negative impacts" is an unbalanced and misleading framing. A decade of modelling studies on a range of models, running a range of scenarios and simulations, have found that moderate use of SRM could significantly reduce many of the impacts of climate change (incl precip and temps) for the great majority of places on the planet. See: Irvine, P. J., Kravitz, B., Lawrence, M. G. and Muri, (2016) H. An overview of the Earth system science of solar geoengineering. WIREs Clim Change, 7: 815–833. doi:10.1002/wcc.423 Kravitz, B, et al (2014. "A multi-model assessment of regional climate disparities caused by solar geoengineering." Environmental Research Letters 9.7 074013. Curry, C. et al (2013) A multimodel examination of climate extremes in an idealised geoengineering experiment. Journal of Geophysical Research: Atmospheres. Moore, J.C., Jevrejeva, S. and Grinsted, A. (2010) Efficacy of geoengineering to limit 21st century sea-level rise PNAS 107 (36) 15699-15703. https://doi.org/10.1073/pnas.1008153107 Moore, J. C. et al. Atlantic hurricane surge response to geoengineering. PNAS, 112 (45) 13794-13799. https://doi.org/10.1073/pnas.1510530112 MacMartin et al 2018 (forthcoming) Phil Trans A [Andrew Parker, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
56976	182	40	182	41	Keith, Wagner and Zabel (Nature Climate Change, 2018), admittedly using an extreme and unlikely scenario, find the CO2 burden under SRM to be 100GtC lower than in a world without SRM. That is not a "minimal" effect. [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
41716	182	41	182	45	The claim that there would be winners and losers from SRM use is not in any meaningful sense supported by the evidence. MacMartin et al (forthcoming 2018 in Phil Trans A) investigates the climatic impacts of using SRM to avoid passing 1.5C and finds that SRM use to hold global temps at 1.5C creates a world that's remarkably similar to a world of 1.5C from emissions reductions, both for temps and precip, without evidence of stark winners and losers. So the evidence we have indicates that moderate use of SRM would not produce any more winners and losers than any other major policy decision and way way fewer losers than not doing SRM and letting temperatures rise. [Andrew Parker, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
57016	182	42	182	45	The claim that a 1.5 world achieved throgh mitigation alone and one achieved through mitigation and albedo modification (which is to say, the contrast that the question sets up) would be very different is not borne out in the most relevant work, eg Macmartin et al (Phil Trans 2018) [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted because SRM is addressed in chapter 4.
57014	182	43	182	43	an SRM implementation -- this suggests that the approaches being contrasted in this paragraph are SRM alone and mitigation+CDR -- but the framing device is a question as to whether SRM can "help" -- which suggests, correctly, that the option to consider is mitigation+SRM+CDR [Oliver Morton, United Kingdom (of Great Britain and Northern Ireland)]	Not applicable - This text was deleted
38704	182	47	182	47	It is not the lifetime of CO2 that is > 1000 yrs. It is the response time of the enhanced CO2 concentration (i.e. of the perturbation). [Jan Fuglestvedt, Norway]	Accepted. We have rephrased this text
7664	182	49	182	49	...stabilization scenarios require…. [Jens Zinke, Germany]	Accepted - Text was revised with the suggested edit
8918	182	49	182	49	stabilization scenariosrequire both' should be 'stabilization scenarios require both' [Robert Shapiro, United States of America]	Accepted - Text was revised with the suggested edit
39200	183	1	183	7	Don't you find this strange, since CCS is still underdeveloped and may never be able to do what is being proposed? Why are you allowing models to include what may not be viable? [Lindsey Cook, Germany]	Noted. In this text we cannot go into the details of the scenarios due to space limitations. This is more relevant for Chapter 2.
42806	183	1	183	7	Distinguish whether these assumptions of CCS always include BECCS. [Kristin Campbell, United States of America]	They do not always include BECCS. Could indeed be mentioned here. Will be considered for correction prior to publication
43052	183	1	183	7	Distinguish whether these assumptions of CCS always include BECCS. And note that BECCS is not carbon neutral in relevant time period. Booth M. S. (2018) “Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy”, Envtl. Research Letters; and Sterman et al (2018) “Does replacing coal with wood lower CO2 emissions? Dynamic lifecycle analysis of wood bioenergy”, Envtl. Research Letters. A discussion of CCUS should be included, with “U” being “utilization.” Global CO2 Initiative, Global Roadmap for Implementing CO2 Utilization (“CO2 curing of cements offers a superior product and superior price and should be able to move quickly if the following strategic actions are taken: • Ensure financing for conversions of precast concrete facilities. • Focus on converting the practices of incumbents rather than creating competitive companies. • Identify the most cost effective places to capture CO2 for this purpose. • Build an infrastructure to deliver CO2 – pipelines ultimately, but probably rail, ship or truck initially.”); Pan S., et al. (2015) An Innovative Approach to Integrated Carbon Mineralization and Waste Utilization: A Review, Aerosol and Air Quality Research (“In addition to the ‘green’ cement, the carbonated alkaline solid waste can function as construction aggregate to partially replace sand, gravel, and crushed stone. Many industrial waste materials can potentially be used as economical and environmentally friendly sand substitutes for cementitious building products.”). [Durwood Zaelke, United States of America]	Rejected. Too detailed riven scope of cross-chapter box. Will consider if these publication may be useful to add in the Annex prior to publication.
13126	183	3	183	5	Delete the text "Because no scenarios explicitly tried to achieve their target without carbon capture and storage, it is nonetheless an open question whether this option is absolutely mandatory.". [Eleni Kaditi, Austria]	Accepted- We have also added references to new publications describing alternative pathways potentially requiring very little CDR.
3660	183	9			Replace 'display' by 'displays'. [David Docquier, Belgium]	Accepted - Text was revised with the suggested edit
24256	183	29	187	1	two tables are adjacent [Nazan AN, Turkey]	Editorial. Formatting will be fixed prior to publication.
9580	184		187		Box 3.2, Table 2 - In the scenarios discussed, it would be useful to include more information about what these scenarios mean for human populations. For example, Arctic shipping routes opening up means many things for Inuit and Arctic communities (both positive and negative) that is not captured here. [Joanna Petrasek MacDonald, Canada]	Noted. We have provided some aspects of human impacts, but text could not be expanded on this point due to space constraints.
13130	184		184		Clarification on whether Scenario 1 considers implementation of the Paris Agreement in the context of sustainable development should be given. [Eleni Kaditi, Austria]	Noted. Will consider adding a sentence on this prior to publication.
24188	184	1	184	7	Redesign the table [Mustafa Tufan Turp, Turkey]	It is unclear from the comment what is suggested. Note that both tables were substantially revised and redesigned.
60642	184	1	187	1	As stated by this Cross-Chapter Box 3.2, Table 2 itself, the storylines here are "subjective" and do not seem to add value to what is already ample material in this chapter. Suggest deleting. [United States of America]	Rejected. Several other reviewers (e.g. #34146, #3662) highlighted that they considered the storylines valuable.
30532	184	7	184	7	« The United States also participated in this effort, through bottom-up contributions from larger cities and larger states » All countries participated in the effort, even any that stayed outside the Paris Agreement through bottom-up contributions from larger cities and larger states." [France]	Accepted. We have changed the text in a similar way as suggested and no longer single out a single country.
34146	184	7	187	2	These storylines are thoroughly brilliant and provides an excellent means of communications. When the same message as is presented multiple times throughout the report is simply put in past tense, like in these storylines, the effect can be very powerful on the reader. The storylines express the confidence the authors have in their conclusions, which again may raise trust among the readers. Please do not remove these storylines from the report, rather consider to give them a more prominent place. [Norway]	Accepted. Storylines have been kept. We have also added throughout references to the underlying chapters to enhanced the robustness of the storylines.
54002	184	7			In Scenario 1, delete "agriculture was intensified in countries xxxxx drastic food wastage". Intensification of industrial agriculture will increase fertilizer and agrochemical use and thus climate change. Instead, it could be: Industrial agriculture is drastically reduce, to support the massive development of small scale, local and low input and agroecological agriculture and local food markets. Ref: ETC Group, Who will feed us, 2017, http://www.etcgroup.org/whowillfeedus . Same can be incorporated in other scenarios [Elenita Daño, Philippines]	Wrong location (should have been page 185). Rejected, our assessment is based on the material from Chapter 2. As evidence base for these scenarios, the SSP1 class of scenarios was taken, which are characterized by high intensification of agriculture so as to limit expansion into natural land and pastures. (see Popp et al, 2017, GEC)

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60644	184	7	184	7	In scenario 1, in Box 3.2, it is surprising to see the Paris Agreement status of a single country singled out. Since the set of Parties to the agreement may change over time and their NDCs may change over time, making conclusions based upon the set of parties at a single point in time limits the report's relevance and potentially its accuracy. For example, for the same set of parties to the Agreement, the emissions scenarios could vary widely depending on NDC ambition. Furthermore not being a party to the Paris Agreement does not preclude emissions reduction goals. The ambition of emissions reductions is more important than being a party to the Agreement. Suggest removing this sentence. [United States of America]	Accepted. We have changed the text in a similar way as suggested and no longer single out a single country.
19306	185		185		irrigation of crops has been expanded is CLEARLY MALADAPTATION, please replace [Spain]	Rejected. Irrigation is not maladaptation if it is done sustainably, i.e. it is not depleting groundwater resources and leaving enough water in the rivers.
16430	185		187		Recommend authors reflect on the policy value of the storylines. We see the IPCC's value add as providing strong evidence base for decision makers which is informed by the science. In particular, the notable absence of attribution for the, at times, extreme conclusion about particular cities and regions, and the absence of references to other areas of the world limits the value of the statements and exposes them to criticism. Other actors in the international community will no doubt draw out 'storylines' from the IPCC's assessment. [Australia]	Noted. We have added a full referencing of the sentences in the storylines to link them to the underlying chapter material.
19308	186		186		again talks about "global temperature of 1.5ºC"…should be global temperature INCREASE of 1.5ºC [Spain]	Accepted. Text has been revised as follows: "By 2100, global mean temperature is on average 0.5°C warmer than it was in 2018"
19642	186		186		Scenario 2 on page 186 with stabilization at 1.5C after overshoot at 2C lists massive irreversible damages and changes in ecosystems, biodiversity, societies, land use, insecurity, hunger, poverty, migration etc and comes to the conclusion "aggregate economic impacts of climate change damage are small, but the loss in ecosystem services instead creates large economic losses. The well-being of people has generally decreased since 2018, while the levels of poverty and disadvantage have increased very significantly." These signal very significant societal, economic and sustainable development impacts of overshoot scenarios vs. non-overshoot scenarios, still information on these are mostly missing in Chapter 3. [Jennifer Morgan, Netherlands]	Noted. There is little literature on this topic and thus the main assessment is based on this cross-chapter box. See revised text under "Key questions": "What is the impact of emissions pathways with, versus without, an overshoot?". We now mention there the relevance of the pace of warming which is directly affecting the assessment of impacts of overshooting. We also cite articles on this topic.
46044	186		187		I could imagine that the comparison of scenario one and three captures the interest of the media. Since I still remember a talk presented by Pitman about the reliability of droughts in climate models I would suggest to be much more careful. Sentences like: 'A 2-year drought in the Great plains and a concomitant drought in Eastern Europe and Russia lead to a decline of global crop production and major increases in food prices. Poverty levels increase to a very large scale and risk and incidence of starvation increase very significantly as food stores dwindle in most countries' are problematic. Despites all uncertainties the report demonstrates convincingly the need to act. To my opinion stretching scientific interpretations towards extremes derogates the report. [Tim Rixen, Germany]	Rejected. Fully agree that projections of drought are more uncertain, but there is also climate variability. In some regions, risk is projected to increase, this also the case in the Great plains, eastern Europe and Russia. Higher temperature in any cases would tend to exacerbate droughts when they occur.
13136	186		186		Delete the text "and human security". [Eleni Kaditi, Austria]	Rejected. Based on chapter 5 assessment.
22492	186				I miss in this page some messages or discussion about the population growth and also about the expansion of deserts and appearance of new arid/semi arid zones. And also that Greenland and Antarctic unanswered questions could jeopardize the sea level rise projections, mainly towards an exacerbation of coastal erosion and flooding. [LUIS VALDES, Spain]	Noted. Because of space constraints, the scenarios cannot be fully comprehensive.
37274	186		187		We consider the Scenario 3 storyline describing SRM deployment to be biased, misleading, and unscientific. It is biased insofar as it is the only storyline involving SRM and is concerned solely with imagining consequences of a "termination shock." Without explicitly stating so, this narrative strongly suggests that the widespread devastation following cessation of SRM is attributable to SRM, in effect presenting solar geoengineering as a dangerous technology with no potential to reduce climate risks and enhance global welfare. In addition, there are very strong reasons (self-interest of individual countries) that suggest rapid termination is very unlikely. The scenario is misleading in that it presents SRM as the worst-case scenario, without acknowledging the range of ways in which SRM could help global society, especially the global poor (Horton and Keith 2016). As the only story featuring solar geoengineering, readers may be led to believe that SRM should not be pursued without having considered the potential benefits of using it in combination with other climate policy tools. Why don't other controversial technologies appear in this storyline, and why doesn't SRM appear in other storylines? Finally, the storyline is unscientific in the sense that its basis is completely unclear. The particular story it tells is just one of an infinite set of possible pathways. Why is it privileged over all others? What method was used to devise it? Why should it be taken as representative? Unless alternative, more balanced storylines involving SRM are offered, we recommend removing this from the draft. [Joshua Horton and David Keith, "Solar Geoengineering and Obligations to the Global Poor," in Climate Justice and Geoengineering: Ethics and Policy in the Atmospheric Anthropocene, ed. Christopher J. Preston (London: Rowman & Littlefield, 2016): 79-92] [Joshua Horton, United States of America]	Noted. We have decided to remove the component describing a failed SRM deployment.
13962	186	1	186	1	Internal climate variability: First, 10% worst-case outcome (2020s), then normal internal climate variability. In this box, I don't quite understand why these intermediate subheadings start with internal climate variability: shouldn't they repeat the case? [Natalie MAHOWALD, United States of America]	Internal climate variability is a component of the scenarios which humans have no control on, but it could affect the outcome of the storyline. This is what we illustrate with storylines 2 vs 3.
13128	186	5	186	5	Reference to inefficient fossil fuel subsidies that encourage wasteful consumption should be made. [Eleni Kaditi, Austria]	Rejected. This assumption was not an explicit part of the scenario basis informing this narrative. Moreover, the literature is inconclusive regarding the impact fossil fuel subsidy removal might have (see Jewell et al, 2017, Nature)
13132	187		187		Delete the text "After peak oil is reached, countries invest massively in renewable energy and develop technologies for carbon capture and storage.". [Eleni Kaditi, Austria]	Not applicable. Text has been substantially revised. Sentence is no longer included.
39202	187	1	187	12	This is a very important description, thank you. Please also engage with statistics on loss of human life, or you may fail to touch the poicy maker (who may have lost appreciation for eco-system and biodiversity importance). [Lindsey Cook, Germany]	Noted. Given some other comments we decided to remove the text on SRM deployment.
29744	188		190		The different themes of the FAQ section provide a very clear and organised understanding of the impacts of warming on human societies, ecosystems, and extreme weather events. It would be interesting to take this classification and adapt it to the presentation of the Executive summary, which will be the most consulted part of the chapter. [Capucine Pagniez, France]	Noted
316	188	1	188	1	As in Chapter 1, the use of FAQ's again here is excellent. The 2 shown here quickly allow readers to understand what the future will look like and hopefully take meaningful action to slow down global warming. [Paul Doyle, Canada]	Noted
50510	188	1	190	48	These FAQs contain a very good summary of what the difference between 1.5 and 2 degrees means; it would be great if they could be included either in the introductory chapter or in the SPM, giving them a more elevated stance [Ina Möller, Sweden]	Noted - FAQs are always placed within the main chapter text of IPCC reports. Additionally they will be compiled into a booklet after the report is published.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
61948	188	1	189	3	This is a long FAQ, a clear focus may be useful. The title should mention "a world half a degree celcius warmer than today" (otherwise 1.5°C is not precise). The italicized part repeats some content of the text, but without building on the most robust findins explicitely (e.g. no mention of heavy rainfall events, but strong emphasis on cyclones). I suggest to stress the hotspot of changes (where changes are significant) both in terms of climate characteristics and impacts, following the last sections of the chapter. The FAQ could also briefly explain how these conclusions are reached. Explain what preindustrial is. For sea ice, please refer to "Arctic" and mention how reduced it may be (not just that it would subsist year round). It would be nice to use this FAQ to integrate better in between 'WGI" and "WGII" outcomes of the assessment. An alternative narrative could be : what is observed with a climate change driver, and what would continue or be amplified for an additional 0.5°C warming (which climate variable, where, what consequences), possibly organised by climate zones (not by continent). My understanding is that impacts are described without adaptation. A description of opportunities (e.g. growing season at high lats, marine Arctic shipping routes) and risks (sectors) would be relevant. [Valérie Masson-Delmotte, France]	Taken into account - the text as been revised to focus hotspots of change and integrate WG1 and 2-related assessment outcomes. The first paragraph of the FAQ provides a summary of the key points discussed in more detail in the main FAQ text, so overlap is intentional. The text has been redrafted to avoid complete repetition. Suggestion for additions were rejected due to space limitation as well as the term 'pre-industrial' being explained in FAQ1.2 and also in the Glossary.
3632	188	3	189	31	Nothing is said about sea-level rise and ice melting, which will continue in a +1.5°C world. Even if the uncertainty is large, it must be mentioned here. What about the impact on human systems? [David Docquier, Belgium]	Taken into account - text has been added on sea level rise.
7214	188	3	189	24	This entire FAQ 3.1 does not refer a single time to poverty. This is worrisome for this SR. [Petra Tschakert, Australia]	Taken into account - text has been added on poverty.
22494	188	17			Replace "what" by "how" [LUIS VALDES, Spain]	Not applicable - text has been revised
35270	188	18	188	18	The word "temporally" is more appropriate to used instead of "over time" [Shaukat Ali, Pakistan]	Not applicable - text has been revised
3626	188	22	188	28	This paragraph is repeating what is said in the beginning of the first paragraph of FAQ 3.1. Please consider merging. [David Docquier, Belgium]	Noted, but the first paragraph of the FAQ provides a summary of the key points discussed in more detail in the main FAQ text, so overlap is intentional. The text has been redrafted to avoid complete repetition.
22496	188	26			I think that a comment on flooding and land loss due to sea level rise is appropriate in this paragraph. [LUIS VALDES, Spain]	Not applicable - text has been revised
46854	188	32	188	32	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
3628	188	35	188	36	The statement about tropical cyclones has already been said in the first paragraph of FAQ 3.1. [David Docquier, Belgium]	Noted, but the first paragraph of the FAQ provides a summary of the key points discussed in more detail in the main FAQ text, so overlap is intentional. The text has been redrafted to avoid complete repetition.
3630	188	42	188	43	Rephrase: 'Year-round Arctic sea ice will continue decreasing but is likely to be maintained in a +1.5°C world'. [David Docquier, Belgium]	Not applicable - text has been revised
22498	188	42			Add "in the Arctic" in the sentence "Year-round se ice in the Arctic is likely…" [LUIS VALDES, Spain]	Not applicable - text has been revised
46856	188	42	188	42	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
10460	188	47	188	47	this might be misunderstood. Recent estimates show that fires have been decreasing due to socioeconomic factors despite increasing climatic fire weather. See andela et al. 2017 in science [Christopher Reyer, Germany]	Not applicable - text has been revised
46858	189	1	189	1	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
56020	189	1	190	48	Again, EXCELLENT FAQs! Agree on placeholder regarding pathway differences. [Pamela Pearson, United States of America]	Noted
22500	189	9			Replace "under increased pressure" by "difficult to sustain" [LUIS VALDES, Spain]	Not applicable - text has been revised
8920	189	12	189	12	are to experiences increased' should be 'are to experience increased' [Robert Shapiro, United States of America]	Not applicable - text has been revised
22502	189	12			delete "s" in "experiences" [LUIS VALDES, Spain]	Not applicable - text has been revised
24102	189	15			up to 8?degrees in Arctic region': Does this mean possibility of 8 degree increase under 1.5 degree increase globally? Please show the session describing evidence [Shuzo Nishioka, Japan]	Not applicable - text has been revised
22504	189	16			Land loss, flooding, erosion in coastal areas? [LUIS VALDES, Spain]	Not applicable - text has been revised
46860	189	19	189	23	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
8922	189	20	189	20	precursor emissions the same, and is likely increase' should be 'precursor emissions are the same, and likely increase' [Robert Shapiro, United States of America]	Not applicable - text has been revised
22506	189	20			insert "are" in "emissions are the same" [LUIS VALDES, Spain]	Not applicable - text has been revised
22772	189	26			Yes.This Placeholder needs to mention overshoot scenario especially [Shuzo Nishioka, Japan]	Taken into account, new draft mentions overshoot.
317	189	34	189	34	FAQ 3.2:.....different from a + 20 C..... [Paul Doyle, Canada]	Not applicable - FAQ has been removed
3642	189	34	190	47	Nothing is said about sea-level rise and its impacts, which constitues one of the main manifestations of the current global warming. According to Section 3.3.10, there is a difference of about 10 cm SLR between 2°C and 1.5°C. [David Docquier, Belgium]	Taken into account - text has been added on sea level rise.
61950	189	34	190	47	I do not fully understand the section headings. "ice regions" also includes sea level and ocean ecosystems. The FAQ only relies on impacts, not on implications of mitigation pathways which may also be different in a 1.5 vs a 2°C (especially for land use). I read the whole FAQ as having a focus on key vulnerabilities, is this correct? [Valérie Masson-Delmotte, France]	Taken into account - text has been revised
49462	189	37			Before the Paris Agreement was signed in 2015 ... the Paris Agreement was adopted in 2015, it was signed later in April 2016. Therefore replace "signed" by "adopted". [Manfred Treber, Germany]	Not applicable - text has been revised
16432	189	42	190	8	Omission of Southern Ocean or Antarctic examples in their listings for “extreme events”. [Australia]	Not applicable - FAQ has been merged with FAQ 3.1
46862	189	43	189	43	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
31484	190	4	190	5	The meaning of “50%” is not clear. Please provide the indicator used to estimate water resources stress. [Japan]	Taken into account - text has been removed
7256	190	10	190	10	The term "ice-regions" is surprisingly at odds with the scientific literature and common use of terms. I understand from the content of the below paragraph, that this corresponds to the "Polar and high mountain areas", if so maybe this term would be more appropriate. Why is ocean acidification and coral reef fate covered under this paragraph ? [Samuel MORIN, France]	Accepted - text has been removed and revised for clarity.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
9624	190	10	190	19	Include a few words here about the recession and even disappearance of the world's mountain glaciers. For a great recent example, see (and cite) the landmark work of Clarke et al. (2015, Nature Geoscience, DOI: 10.1038/NGEO2407). [Sean Fleming, United States of America]	Taken into account - text has been added mentioning glaciers.
16434	190	10	190	12	There is no mention of Antarctic sea ice, even though the absolute change in ice extent for loosing all Antarctic sea ice will exceed that of loosing all Arctic sea ice… hence significant consequences under a +1.5oC warming. [Australia]	Taken into account - text has been added on Antarctica ice.
30534	190	11	190	12	This first sentence is repetitive. We would suggest deleting "the Arctic may retain some summer sea ice". [France]	Not applicable - FAQ has been merged with FAQ 3.1
46864	190	11	190	11	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
3634	190	13			Remove 'this' before 'the'. [David Docquier, Belgium]	Not applicable - FAQ has been merged with FAQ 3.1
8924	190	13	190	13	but this the release' should be 'but the release' [Robert Shapiro, United States of America]	Not applicable - FAQ has been merged with FAQ 3.1
9410	190	13	190	14	Incorrect terminology- replace "melting" with "thawing" Also permafrost thaw doesn't necessarily mean carbon thaw (see earlier comments). [Sharon Smith, Canada]	Not applicable - FAQ has been merged with FAQ 3.1
35272	190	13	190	13	In "but this the release", the word "this" is not needed. [Shaukat Ali, Pakistan]	Not applicable - FAQ has been merged with FAQ 3.1
49464	190	13			of an estimated 2 million km2 of permafrost, but this the release of this (...) ... delete "this" before "the release" [Manfred Treber, Germany]	Not applicable - FAQ has been merged with FAQ 3.1
167	190	14	190	15	Again, see my comment on entire chapter. If WAIS has a threshold, it could result in a multimeter sea level contribution on a time scale of centuries, not millennia. [Michael Oppenheimer, United States of America]	Not applicable - text has been revised and no longer mentions permafrost.
30536	190	14	190	16	This passage sounds strange as the second sentence is not a consequence of the first one. [France]	Not applicable - FAQ has been merged with FAQ 3.1
318	190	15	190	19	CREATE a new sub-heading entitled "OCEANS" at "Consequently..... [Paul Doyle, Canada]	Rejected - subheading were removed for final FAQ draft to maintain consistent style with other FAQs.
3636	190	15			Add '°' (degree unit) before 'C'. [David Docquier, Belgium]	Not applicable - FAQ has been merged with FAQ 3.1
49466	190	15			around 1.5 and 2.0C. Consequently ... insert ° before C: "around 1.5 and 2.0°C" [Manfred Treber, Germany]	Not applicable - FAQ has been merged with FAQ 3.1
34756	190	17	190	19	It is important to note that overshoot pathways to 1.5°C (including those that accomplish ramp-down through land-based CDR) will have higher ocean acidification than pathways that do not overshoot. Carbon taken up by the ocean (causing acidification) will not immediately leave the ocean during CO2 ramp-down in the atmosphere. In addition to implications for acidification, this lag also means that -- on short time scales only -- cumulative emissions in an overshoot simulation may exceed cumulative emissions in a non-overshoot at the crossover point for their temperatures (Palter et al., 2018) . However, as the ocean comes to equilibrium by fluxing the anthropogenic CO2 back into the atmosphere, this delayed flux will need to be balanced by a sink to prevent warming. In addition, permafrost melting could reduce the cumulative carbon budget under overshoot forcing (MacDougall et al., 2015 Environ. Res. Lett. 10 (2015) 125003) [Jaime Palter, United States of America]	Noted - text on overshoot vs non-overshoot pathways impacts does not go into this level of detail however, due to length limitations of the FAQ. Ocean acidification differences between 1 and 2°C is covered.
664	190	18	190	19	Since this section is entitled "Ice-regions" the mention to coral reefs should be better placed in the next section ("ecosystems"). [Maria Jesus Iglesias Briones, Spain]	Not applicable - FAQ has been merged with FAQ 3.1 and text has been revised
34148	190	18	190	19	Does this sentence relate to the ice regions? We would expect that it is a description of consequences in the ice-regions. Please consider to remove it. [Norway]	Not applicable - FAQ has been merged with FAQ 3.1 and text has been revised
46866	190	18	190	18	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
22508	190	21			melting of permafrost and methane emissions? [LUIS VALDES, Spain]	Not applicable - FAQ has been merged with FAQ 3.1 to focus on the hotspot points of change.
46890	190	24	190	24	Check use of IPCC uncertainty language. Text should be highlighted in italic font when used. Please use alternative wording if not meant to be official IPCC uncertainty language. [Sarah Connors, France]	Taken into account - text has been revised to use IPCC uncertainty correctly
7216	190	33	190	34	In which populations? How? Be explicit. [Petra Tschakert, Australia]	Not applicable - text has been removed
3638	190	40			Add 'be' between 'will' and 'felt'. [David Docquier, Belgium]	Not applicable - FAQ has been merged with FAQ 3.1
8926	190	40	190	40	will felt' should be 'will be felt' [Robert Shapiro, United States of America]	Not applicable - FAQ has been merged with FAQ 3.1 and text has been revised
21546	190	40	190	41	The sentence is not clear. [Nathalie HILMI, France]	Not applicable - FAQ has been merged with FAQ 3.1 and text has been revised
49468	190	40			(...) from projected climatic change will felt across multiple (...) ... what means "will felt"? [Manfred Treber, Germany]	Not applicable - FAQ has been merged with FAQ 3.1
3640	190	41			Add 'are' between 'that' and 'important'. [David Docquier, Belgium]	Not applicable - FAQ has been merged with FAQ 3.1
8928	190	41	190	41	that important' should be' that are important' [Robert Shapiro, United States of America]	Not applicable - FAQ has been merged with FAQ 3.1 and text has been revised
319	190	46	190	47	Excellent sugestion! [Paul Doyle, Canada]	Noted
24104	190	46			Yes.This Figure orTable can be a good at a glance conclusion to inform policy makers and non-experts. [Shuzo Nishioka, Japan]	Noted
49972	190	46	190	47	Provide also the tipping point of thresholds for the impacts of warming condition on key development sectors such as food, health, water, and energy. [Perdinan Perdinan, Indonesia]	Rejected - specific detail on tipping points is not appropriate for an FAQ, rather to explain the relevance of tipping points and give an example. Details can be discussed in the chapter main text.
666	191	1	248	29	There are a fair number of references that are either incomplete, or that are not yet a full reference and a good number of them are repeated. This also confirms my suspicion that this second version was submitted without being properly revised. [Maria Jesus Iglesias Briones, Spain]	At the moment when the SOD was being prepared, many papers were not yet published. Details of papers included in the chapter will be revised prior to publication.
12174	191	3	248	29	There are several instances where the same paper appears twice or even three times in the reference list, eg. Bindoff et al (2013), Ciais et al (2013), Myhre et al (2013), Schleussner et al (2016) [United Kingdom (of Great Britain and Northern Ireland)]	Editorial - copyedit to be complete prior to publication
47260	191	17	191	25	Reference duplicated. One has editors listed one does not. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
2230	191	36	191	36	DOI of Ahlström et al. (2012) is doi:10.1088/1748-9326/7/4/044008. [Akihiko Ito, Japan]	Thanks. Information was added.
2232	191	40	191	40	CO 2' should be 'CO2' (subscript 2) [Akihiko Ito, Japan]	Editorial - copyedit to be complete prior to publication
47262	191	40	191	41	This reference, along with Oleson et al., 2010, is cited three times in page 35, page 128, page 161 with repeated statement. Please consider whether such repeatation is necessary [Sarah Connors, France]	Reference was kept.
408	191	56	192	1	Reference by Alfieri et al. (submitted) should be replaced with: Alfieri, L., Dottori, F., Betts, R., Salamon, P. and Feyen, L.: Multi-Model Projections of River Flood Risk in Europe under Global Warming, Climate, 6(1), 6, doi:10.3390/cli6010006, 2018. [Lorenzo Alfieri, Italy]	Thanks. Reference was not published at the moment of the preparation of the SOD.
18532	191	56	192	1	The paper has been published and reference can be updated: http://www.mdpi.com/2225-1154/6/1/6 [Andrea TILCHE, Belgium]	Thanks. Reference was not published at the moment of the preparation of the SOD.

Comment No	From Page	From Line	To Page	To Line	Comment	Response
47264	193	2	193	3	Armour et al 2009: Citation used twice with repeated statements on Page 57 and Page 159. The whole paragragh citing this reference is the same in these two sections. [Sarah Connors, France]	Accepted. Text has been revised
47270	193	28	193	30	Astrom et al (2013) Cited three times with completely identical statements on Page 121, Page 146 and Page 156 [Sarah Connors, France]	Reference is not included in final version of the chapter.
47334	193	33	193	34	Reference not correct. Should be “Swann, T., and Campbell, R. (2016).… http://www.tai.org.au/sites/defualt/files/Swann%20Campbell%202016%20Great%20Barrier%20Bleached%20FINAL%20w%20cover.pdf [Sarah Connors, France]	Not applicable. Reference is not in final version of the chapter.
47278	194	53	194	53	Benjamin and Thomas (2016) Reference is missing information on page number / journal issue number etc. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47336	195	5	195	6	Journal missing. Please update with details of joural once published [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47284	195	45	195	50	Reference: Bohra-Mishra, 2014a and 2014b are same reference - please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
22510	196	42			Add reference "Brigham-Grette et al., 2013" (cited in page 61) [LUIS VALDES, Spain]	Accepted. Reference has been added.
47286	197	13	197	16	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47288	197	28	197	31	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47290	197	41	197	42	Burke reference is missing pge numbers / journal issue. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47300	198	23	198	25	Cai 2014 is not listed anywhere in the main chapter text. [Sarah Connors, France]	Accepted. List has been revised.
2234	199	33	199	34	Arctile title should be in lowercase except the first word. [Akihiko Ito, Japan]	Editorial - copyedit to be complete prior to publication
47306	200	5	200	40	Repeated references, please remove duplication. One is missing the full title of the AR5 report. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47304	200	12	200	12	Formatting issue with second author's name in Chollett 2014 [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
299	200	29	200	29	Reference shows all "a" initials in small letters. [Paul Doyle, Canada]	Editorial - copyedit to be complete prior to publication
6112	200	35	200	35	add this reference: "Chust, G., J. I. Allen, L. Bopp, C. Schrum, J. Holt, K. Tsiaras, M. Zavatarelli, M. Chifflet, H. Cannaby, I. Dadou, U. Daewel, S. L. Wakelin, E. Machu, D. Pushpadas, M. Butenschon, Y. Artioli, G. Petihakis, C. Smith, V. Garçon, K. Goubanova, B. Le Vu, B. A. Fach, B. Salihoglu, E. Clementi, and X. Irigoien. 2014. Biomass changes and trophic amplification of plankton in a warmer ocean. Global Change Biology 20:2124-2139." [Guillem Chust, Spain]	Accepted. Reference has been added.
47338	202	14	202	14	No news items or blog posts can be used as references in an IPCC report. Please find alternative reference or remove text. Please follow the IPCC guidelines for grey literature: https://wg1.ipcc.ch/guidancepaper/AR5GuidanceNotes_Literature.pdf [Sarah Connors, France]	Accepted. Reference has been removed.
47308	203	19	203	23	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47340	203	43	203	44	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47310	204	15	204	20	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47342	204	26	204	27	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47344	205	29	205	29	Invalid reference. This paper to be cited should be submitted for review before 01 November 2017 and accepted before 15 May 2018. [Sarah Connors, France]	Accepted. Reference has been removed.
22512	207	56			This reference is duplicated (see next page ref in line 3) [LUIS VALDES, Spain]	Editorial - copyedit to be complete prior to publication
47312	209	14	209	15	Formatting error in title of journal in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47346	209	47	209	47	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47348	210	20	210	20	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47350	210	36	210	37	Formatting error, make title not all uppercase [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
58540	210	40	210	40	Typo in reference : "–" [Paul Leahy, Ireland]	Editorial - copyedit to be complete prior to publication
35444	211				Hirche A., Salamani M., Abdellaoui A., Benhouhou S., •Martínez Valderrama J. 2011.- Landscape changes of desertification in arid areas: the case of south-west Algeria. Environ Monit Assess (2011) 179:403–420. DOI 10.1007/s10661-010-1744-5 [Dalila NEDJRAOUI, Algeria]	Thanks. Chapter is not directly related to 1.5ºC, it can be considered in AR6
35446	211				Hirche A. & al 2015,- Three Decades of Ecological Monitoring in Algerian Arid Rangelands, in Arid and Semi-Arid Environments: Biogeodiversity, Impacts and Environmental Challenges, Nova Sciences Publishers, 125-146, DOI: 10.1002/9781634834100.ch5 [Dalila NEDJRAOUI, Algeria]	Thanks. Chapter is not directly related to 1.5ºC, it can be considered in AR6
47314	211	24	211	27	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47352	211	56	212	1	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
22514	212	22			Add reference "Hoffman et al., 2017" (cited in page 61) [LUIS VALDES, Spain]	Accepted. Reference has been added.
144	212	54	212	54	Gon??alves that is surely a typing error [teodoro georgiadis, Italy]	Editorial - copyedit to be complete prior to publication
47316	213	3	213	8	Repeated references, please remove duplications. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47318	214	5	214	5	IPCC 2007 reference format is incorrect and missing fields [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
53444	214	15	214	15	WG1 should be written as WGI [Seyed Muhammadreza Tabatabaei, Iran]	Editorial - copyedit to be complete prior to publication
53562	214	15	214	15	WG1 should be written as WGI [mahnaz khazaei, Iran]	Editorial - copyedit to be complete prior to publication
39910	214	45	214	46	submitted is repeated. [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
47354	216	7	216	11	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
39912	217	36	217	36	Replace "1.5oC and 2oC" by "1.5°C and 2°C". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
47356	218	10	218	10	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47358	219	12	219	16	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
35442	220				Linares J.C., Taïqui L. and Camarero J.J. 2011.- Increasing Drought Sensitivity and Decline of Atlas Cedar (Cedrus atlantica) in the Moroccan Middle Atlas Forests. Forests 2011, 2, 777-796; doi:10.3390/f2030777 [Dalila NEDJRAOUI, Algeria]	Thanks. Paper is not directly related to 1.5ºC. It can be considered in AR6.
47360	220	55	220	56	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
39914	220	56	220	56	Replace "1.5oC and 2oC" by "1.5°C and 2°C". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
2214	221	1	221	1	Lizumi' should be 'Iizumi' [Akihiko Ito, Japan]	Accepted. Reference has been corrected.
22516	222	21			Add reference "Marcott et al., 2013" (cited in page 61) [LUIS VALDES, Spain]	Accepted. Reference has been added.
47362	223	4	223	5	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47364	223	8	223	10	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
39916	223	9	223	10	submitted is repeated. [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication

Comment No	From Page	From Line	To Page	To Line	Comment	Response
47366	224	16	224	17	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
14176	224	28	224	33	Repeated references [Rongshuo Cai, China]	Editorial - copyedit to be complete prior to publication
39918	224	28	224	33	The citation is repeated two times consecutively (Mitchell...) [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
47368	224	53	224	54	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47370	226	12	226	21	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
4532	226	25	226	25	Please change the citation from Navarro, J. et al. to Acosta Navarro, J et al. (I am the first author and would like to keep the spanish naming with two last names if possible) [Juan Camilo Acosta Navarro, Spain]	Thanks. Information has been corrected
47320	227	28	227	28	Formatting error in title of journal in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
3560	227	31	227	34	The two Notz and Stroeve (2016) papers are similar. Please remove one of them. [David Docquier, Belgium]	Editorial - copyedit to be complete prior to publication
47322	227	31	227	34	Repeated references, please remove duplications. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
29484	228	17	228	24	Please order the references by year. [Joan A. Lopez-Bustins, Spain]	Editorial - copyedit to be complete prior to publication
47372	228	54	228	54	Invalid reference. This paper to be cited should be submitted for review before 01 November 2017 and accepted before 15 May 2018. [Sarah Connors, France]	Accepted. Reference has been corrected.
47324	230	19	230	22	Repeated references, please remove duplications. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47374	231	53	231	53	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
50586	232	45	232	45	Correct citation for Ricke et al. is Nature Geoscience 9, 5–6 (2016) [Jacob Schewe, Germany]	Accepted. Reference has been corrected.
47326	233	1	233	2	Paper page numbers missing and no year of publication [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
39920	234	44	234	44	There are several typos in "O'". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
36052	235	13	235	21	References Schleussner et al. (2016b), Schleussner et al. (2016c) and Schleussner et al. (2016d) are same. To be corrected as same references in the text. [India]	Editorial - copyedit to be complete prior to publication
47328	235	13	235	21	Repeated references, please remove duplications. One reference is out of date - it is refering to the discussion paper but this paper has now been accepted into ESD (from ESDD) [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
50556	235	13	235	21	The same Schleussner et al. (2016) study is cited three times. The discussion version (ESDD) should be replaced by the final revised paper (ESD), and the typesetting corrected. Also, citations of Schleussner et al. throughout the text do not always indicate which paper (a, b, ...) is referred to. [Jacob Schewe, Germany]	Editorial - copyedit to be complete prior to publication
39922	235	17	235	17	There are several typos in "°C and 2 °C.". [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
46348	236	14	236	14	POLITICAL GEOGRAPHY in upper cases whereas the journal name is in lower cases elsewhere. [Etienne Piguet, Switzerland]	Editorial - copyedit to be complete prior to publication
47376	236	38	236	39	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47330	238	29	238	32	Repeated references except for year (2015 and 2016), please remove duplications. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47378	239	41	239	42	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47332	240	12	240	19	Repeated references, please remove duplications. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
41746	241	33	241	34	The reference to Thober et al. (2017) should read: Thober, S., Kumar, R., Wanders, N., Marx, A., Pan, M., Rakovec, O., Samaniego, L., Sheffield, J., Wood, E. F., and Zink, M. (2018): Multi-model ensemble projections of European river floods and high flows at 1.5, 2, and 3 degree global warming. Environ. Res. Lett. 13 014003 [Stephan Thober, Germany]	Accepted. Reference has been corrected.
47380	241	33	241	36	Repeated references, please remove duplication and also Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
145	241	38	241	38	{\textdegree} typing error? [teodoro georgiadis, Italy]	Editorial - copyedit to be complete prior to publication
47382	242	34	242	35	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
22518	242	42			Add reference "Valdés, 2011" (cited in page 61) [LUIS VALDES, Spain]	Reference is not included in final version of the chapter.
47384	243	13	243	14	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47386	245	1	245	2	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47388	245	6	245	7	Journal missing in this reference [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47390	245	14	245	19	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
22520	245	26			This reference is duplicated [LUIS VALDES, Spain]	Editorial - copyedit to be complete prior to publication
39924	245	26	245	29	The citation is repeated two times consecutively (Weber...) [Hernan Edgardo Sala, Argentina]	Editorial - copyedit to be complete prior to publication
47392	245	26	245	29	Repeated references, please remove duplication. [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
47394	246	25	246	25	Please add publishers to this grey iterature source [Sarah Connors, France]	Editorial - copyedit to be complete prior to publication
115	247	43	247	43	The title of the literature is garbled. [Toshichika Iizumi, Japan]	Editorial - copyedit to be complete prior to publication
35438	248				Slimani S., Derridj A. and Gutierrez E. 2014.- Ecological response of Cedrus atlantica to climate variability in the Massif of Guetiane (Algeria). Forest systems (2014) 23(3): 448-460. DOI: 10.5424/fs/2014233-05175. [Dalila NEDJRAOUI, Algeria]	Thanks. Paper is not directly related to 1.5ºC. It can be considered in AR6.
35440	248				Slimani H., Aidoud A., Rose F. 2010.- 30 Years of protection and monitoring of a steppic rangeland undergoing desertification. Journal of Arid Environments .74 (2010). 685-691. [Dalila NEDJRAOUI, Algeria]	Thanks. Paper is not directly related to 1.5ºC. It can be considered in AR6.