| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 1 | 36517 | 21 | 0 | 0 | 0 | 0 | The references need more work. In the course of my review, I came across quite a few which were missing (thus making it more difficult to refer to the underlying material), and also noted that quite a few were rather non-recent. In some cases, it would also seem that the presently used grey litterature could be replaced with peer-reviewed sources. Some of these observations are noted in my detailed comments, but limited to the occasions when I would have needed to check the basis of the statement, but could not locate a reference entry in the draft chapter references list. (M Rummukainen, SMHI) | References are being closely examined and updated. |
| 2 | 36518 | 21 | 0 | 0 | 0 | 0 | There are quite extensive text passages that do not have any references. In some cases this may be quite acceptable due to the nature of the text. In other, supporting references would be useful. This may just be about not marking all placeholders for intended references, but please explore this. (M Rummukainen, SMHI) | For the SOD there have been substantial rewrites and this will be taken into account |
| 3 | 36519 | 21 | 0 | 0 | 0 | 0 | There are several occasions that reference is made to the WGI contribution to AR5. This is very useful and adds to the coherency of the overall AR5. Nevertheless, additional referencing can be made, e.g. when discussing regional climate aspects, but also elsewhere. Otherwise there may be some risk of an own mini-assessment of the WG I -related matter. Of course, papers that post-date the WGI deadline could be useful to assess, when relevant. (M Rummukainen, SMHI) | Cross referencing to WG1 is not yet as explicit as intended, and will be improved in later drafts. This is in part because some of the WG1 report is in a state of flux as regard relevant sections for this chapter. |
| 4 | 38268 | 21 | 0 | 0 | 0 | 0 | Looking at figures and tables made for the different chapters, there are similarities (e.g. magnitude of temperature and rainfall changes, impacts on ecosystems...) between chapters because they have they deliver similar information, but for different regions. (Guillaume Simioni, INRA) | Yes. |
| 5 | 38269 | 21 | 0 | 0 | 0 | 0 | Having a similar layouts (i.e. same styles and legends, symbols, columns, colors, ...) accross the chapters, would help the comparison between regions. Not sure it is important, especially if the readership is different from one chapter to another. It's just a suggestion. (Guillaume Simioni, INRA) | This is a WG2 TSU issue as our chapter is not in positipon to dictate a common structure. However, it is a point of discussion in the development of the WG2 draft. |
| 6 | 39973 | 21 | 0 | 0 | 0 | 0 | This chapter requires an overall general edit. Apart from this, there is overkill with the use of acronyms and the reader is overwhelmed. Please include a glossary, or define acronyms as they are presented in the text. The references need attention: some references are in alphabetical order, others in chronological order and others in a random order. There is inconsistent italicisation of et al.. For consistency, other Latin words used in an English sense (e.g. per, via, sensu, ceteris paribus) need to be in italics as well. There is inconsistent use of Century/century; 21st, 21st, 20th, 20th, 21st-Century; there is an annoying mixture of American and British English. (Peter Burt, University of Greenwich) | This is an early draft, and extensive editing is underway. A glossary is also in draft and available for review. References are being attended to in the next draft. Formatting will be addressed as part of the subsequent draft production process. |
| 7 | 41572 | 21 | 0 | 0 | 0 | 0 | Somewhere there needs to be a description of : a) the projected GLOBAL climate changes that are assumed (and againstwhich the global impacts chapters are assessed; and b) the projected SOCIO-ECONOMIC-TECHNOLOGY-GOVERNANCE futures (BOTH global and regiona) that underpin the assessment. I suggest the regional s-e scenarios be described in Ch21, and the global s-e scenarios +global CC scenarios be described in Ch1 (Martin Parry, Imperial College) | This will be taken into consideration as we develop the next drafts. |
| 8 | 41573 | 21 | 0 | 0 | 0 | 0 | The regional scatter diagrams of T and P in AR4 proved to be useful both as a guide for regional authors and for readers…and I did not come across these in this draft of Ch21. Was something similar issued to regional atuhors PRIOR to their assessment and, if so, can these description be given here (or ref made to the supporting material)? (Martin Parry, Imperial College) | These will be included in subsequent drafts as suplementary material, pending the CMIP-5 freeze for WG1. |
| 9 | 43125 | 21 | 0 | 0 | 0 | 0 | This chapter has a very long way to go. I found it very uneven, with very detailed treatment of stuff I was marginally interested in, and little treatment of stuff I find important. The stated role is to be'an assesment for the practical application and translation of information into a regional context'. This is a worthy goal, but the chapter doesn't come close to this at presnt. (Jean Palutikof, Griffith University) | The early uneveness is recognized, and a key focus of the next revision. |
| 10 | 43702 | 21 | 0 | 0 | 0 | 0 | The chapter seems to be heavily biased towards the physical sciences and does not cover the ranges in adaptive responses that are starting to be seen across different countries because of cutural or social aspects of behaviour. For example section 2.4.1 on Physical Science Research is just summarising information that is available in the WG1-AR5 and yet this is more than twice as long as any other section in the chapter. I would argue that the lead authors should restructure the chapter to recognise that sections 5 and 6 are more important than section 4. (Martin Manning, Victoria University of Wellington) | This is recognized, and the next draft includes significant structure changes. |
| 11 | 44543 | 21 | 0 | 0 | 0 | 0 | Section 21.3.4.2.2: Ensure consistency and cross-referencing to relevant WGI AR5 chapters here, particularly Chapter 9. (Thomas Stocker, IPCC WGI TSU) | Cross referencing to WG1 is not yet as explicit as intended, and will be improved in later drafts. This is in part because some of the WG1 report is in a state of flux as regard relevant sections for this chapter. |
| 12 | 44544 | 21 | 0 | 0 | 0 | 0 | Section 21.4.1.1.2: This section on ' new understanding' should include more key findings from chapter 3 of the SREX, given that chapter 3 contained a level of regional detail for extremes far beyond what was provided in the AR4. (Thomas Stocker, IPCC WGI TSU) | Agreed, and measures are being included in the next draft to address this. |
| 13 | 44545 | 21 | 0 | 0 | 0 | 0 | Section 21.4.1.1.3: For all regional subsections please ensure consistency and cross-referencing to Chapter 14 of WGI AR5. (Thomas Stocker, IPCC WGI TSU) | Cross referencing to WG1 is not yet as explicit as intended, and will be improved in later drafts. This is in part because some of the WG1 report is in a state of flux as regard relevant sections for this chapter. |
| 14 | 44546 | 21 | 0 | 0 | 0 | 0 | Section 21.4.1.2.2: Opportunity here to refer to the findings from SREX in relation to extreme sea level/waves/coastal impacts. (Thomas Stocker, IPCC WGI TSU) | Agreed … the appropriate place and profile for this material in WG2 will be explored in subsequent drafts |
| 15 | 44547 | 21 | 0 | 0 | 0 | 0 | Section 21.4.1.4.2: Crucial here that the numbers you provide and terminology that you use are consistent with Chapter 4 of the WGI AR5. Use the specific terminology from Chapter 4, and not confusing vague terms such as 'Arctic ice' so that you do not confuse 'sea ice' with 'ice sheets' etc. (Thomas Stocker, IPCC WGI TSU) | Agreed, we will address this in subsequent revisions |
| 16 | 44583 | 21 | 0 | 0 | 0 | 0 | please unify the cites: sometimes you write IPCC 2012, sometime IPCC, 2012 (Frank Kreienkamp, Climate & Environment Consulting Potsdam GmbH) | Consistency of referencing will be addressed in subsequent revisions. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 17 | 47955 | 21 | 0 | 0 | 0 | 0 | Regional chapters are useful but would benefit from similar intellectual frameworks/structures (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies) | This is a cross chapter issue and part of the wider WG discussions. For chapter 21, as a bridging chapter, we seeks to provide the most appropriate framework to supprt the geographic regional chapters. |
| 18 | 48130 | 21 | 0 | 0 | 0 | 0 | I have the impression that the "regional atlas" produced by WGI could be more extensively used in this volume, especially chapter 21. The atlas, which is based on RCP scenarios, may perhaps be used to achieve a minimum of integration in the assessment of impacts based on studies using different scenarios (as many impact studies are still based on SRES) ? A difficulty may be that impacts frequently consider specific climate indices, in particular related to extremes : cooperation with WGI may presumably provide additional maps related to these indices, based on global climate simulations that could not explore all details, but may help establishing a common framework ? (Philippe Marbaix, Université catholique de Louvain) | This has been recognized and is an explicit focus activity in the next draft. |
| 19 | 48564 | 21 | 0 | 0 | 0 | 0 | I haven't seen much of a discussion about land use/land cover change here. I would have thought this is highly relevant to the regional-to-local climate change discussion of this chapter. (Dáithí Stone, University of Cape Town) | There is a section on land-use change scenarios in the section on Scenarios |
| 20 | 48679 | 21 | 0 | 0 | 0 | 0 | Following from the ZOD, I believe you are assembling an invaluable contribution with this chapter. (Dáithí Stone, University of Cape Town) | Thank-you |
| 21 | 51161 | 21 | 0 | 0 | 0 | 0 | 1) Overall -- In preparing the 2nd-order draft, the chapter team should prioritize making each section of the chapter a polished, comprehensive treatment of topics considered. From these sections, the chapter team is then encouraged to maximize the utility of its findings, ensuring that they are robust, compelling, and nuanced. Themes to consider informing in constructing findings include decisionmaking under uncertainty, risks of extreme events and disasters, avoided damages, and limits to adaptation. To these ends, the chapter team has prepared a solid 1st-order draft. To inform further chapter development, I provide some general and specific comments below. (Katharine Mach, IPCC WGII TSU) | Thank you. The chapter will include significant reorganization of material in the next draft. |
| 22 | 51162 | 21 | 0 | 0 | 0 | 0 | 2) Highlighting key findings -- In developing the 2nd-order draft, the chapter team should aim to present key findings across the sections of the chapter, using calibrated uncertainty language to characterize its degree of certainty in these conclusions. In this way, a reader of the chapter will be able to understand how the literature reviews and syntheses in the chapter sections--the traceable accounts--support the conclusions of the chapter, especially those presented in the executive summary. Additionally, identification of key findings throughout the chapter will enable the author team to develop further an executive summary that spans effectively from overarching big-picture conclusions to meaningfully specific and nuanced explanatory detail. (Katharine Mach, IPCC WGII TSU) | Agreed. We will endeavour to address this in the next draft. |
| 23 | 51163 | 21 | 0 | 0 | 0 | 0 | 3) Usage conventions for calibrated uncertainty language -- Where used, calibrated uncertainty language, including summary terms for evidence and agreement, levels of confidence, and likelihood terms, should be italicized. In addition to incorporating these terms directly into sentences, the author team may find it effective to present them parenthetically at the end of sentences or clauses. Casual usage of the reserved uncertainty terms should be avoided, as has been flagged in some specific comments throughout the chapter. (Katharine Mach, IPCC WGII TSU) | Agreed. We will endeavour to address this in the next draft. |
| 24 | 51164 | 21 | 0 | 0 | 0 | 0 | 4) Complete chapter development -- The chapter team should ensure that all text, tables, and figures are fully developed by the 2nd-order draft. (Katharine Mach, IPCC WGII TSU) | Substantial redevelopment is part of the next draft. |
| 25 | 51165 | 21 | 0 | 0 | 0 | 0 | 5) Comprehensiveness and balance -- The author team should ensure robust referencing for all sections, with presentation of citations that reflect the full range of information available in the literature. (Katharine Mach, IPCC WGII TSU) | Referencing is receiving attention. |
| 26 | 51166 | 21 | 0 | 0 | 0 | 0 | 6) Reduction of redundancy -- Within and among sections, the author team should aim to reduce overlap and tighten sections accordingly. Some reduction of length in this way would further strengthen the accessibility and clarity of the chapter's assessment. (Katharine Mach, IPCC WGII TSU) | Substantial redevelopment is part of the next draft. |
| 27 | 51167 | 21 | 0 | 0 | 0 | 0 | 7) Figures -- The author team is encouraged in its development of figures, as well as tables, as an important and effective means of communication in addition to the chapter text. (Katharine Mach, IPCC WGII TSU) | Substantial redevelopment is part of the next draft. |
| 28 | 51168 | 21 | 0 | 0 | 0 | 0 | 8) Coordination across the Working Group 2 contribution -- In developing the next draft of the chapter, the author team should consider treatment of topics not only in this chapter, but also across the report as a whole. For each topic, the chapter team should ensure that treatment here is reduced to the essence of what is relevant to the chapter, with cross-references made to other chapters as appropriate, also minimizing overlap in this way. (Katharine Mach, IPCC WGII TSU) | Subject to uncertainty of treatment in other chapters and in WG1, this is an intent of the next draft. |
| 29 | 51169 | 21 | 0 | 0 | 0 | 0 | 9) Harmonization with the Working Group 1 contribution to the AR5 -- At this stage of chapter drafting, the author team should carefully consider the working group 1 contribution. Wherever climate, climate change, climate variability, and extreme events are discussed, the chapter team should ensure that their treatment is harmonized with the assessment findings of working group 1. (Katharine Mach, IPCC WGII TSU) | Subject to uncertainty of treatment in WG1 and known extensive rewrites underway in WG1, this is an intent of the next draft. |
| 30 | 53410 | 21 | 0 | 0 | 0 | 0 | The chapter provides interesting explanations of models and modeling that should be helpful to policymakers. (Kristie L. Ebi, IPCC WGII TSU) | Thank you. |
| 31 | 53411 | 21 | 0 | 0 | 0 | 0 | The chapter needs additional informatio on non-climate issues relevant to the regional chapters. (Kristie L. Ebi, IPCC WGII TSU) | This will be expanded on to some degree in the next draft. |
| 32 | 53412 | 21 | 0 | 0 | 0 | 0 | The chapter could use a discussion of different baselines (pre-industrial, 1961-90, etc.), including the challenges of comparing results that used different baselines. (Kristie L. Ebi, IPCC WGII TSU) | the discussion of baselines is being reworked and will take cognizance of this. |
| 33 | 53413 | 21 | 0 | 0 | 0 | 0 | Removing some of the repetitious material will help with shortening the chapter. (Kristie L. Ebi, IPCC WGII TSU) | Significant reworking of the text is underway. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 34 | 54472 | 21 | 0 | 0 | 0 | 0 | GENERAL COMMENTS: I would like to thank the authors for their work on the FOD. When considering the expert review comments received on your chapter and the next round of revisions, I suggest several overall priorities. (1) Keep in mind that the preparation of the SOD is the time to ensure that each section of the chapter presents a comprehensive treatment of relevant literature, and that the Executive Summary presents findings that capture the key insights that arise from the chapter assessment. (2) This is also the time to focus on distilling the chapter text, not just fine-tuning wording but editing with a critical eye to improving quality by making discussions succinct and synthetic, while still being comprehensive. (3) As this author team knows well, cross-chapter and cross-Working Group coordination are also important at this stage, and the author team has clearly invested extensive effort in this already, with more work to be done. One aspect I would like to highlight is coordination with other chapters regarding descriptions of the RCPs and SSPs. Several other chapters are developing boxes or other text, including Chapter 1, Chapter 2 (who notes work on a joint box with your chapter), Chapter 19, and Chapter 20. Coordination across these descriptions would be very useful. (Michael Mastrandrea, IPCC WGII TSU) | We agree with this advice, and are paying close attention in particular to coordination on language describing RCPs and SSPs. |
| 35 | 54473 | 21 | 0 | 0 | 0 | 0 | EXECUTIVE SUMMARY: Thank you as well for developing an initial draft of an Executive Summary for the FOD. For the SOD, the author team should focus on constructing assessment findings of the form employed by other chapters. Each paragraph should present an assessment finding in bold with calibrated uncertainty language, followed by additional nonbold sentences providing further explanation and context, as well as line of sight to supporting chapter sections where the traceable account appears. In the context of linking chapter text with Executive Summary findings, I would also suggest considering ways to explain the calibrated uncertainty language used in the Executive Summary (once it is developed) in the corresponding chapter section(s) where the traceable account appears for each finding. For example, in situations where confidence in a finding is not high, it would be useful to understand why the author team has made this judgment--what are the factors that limit confidence. In situations where confidence is high and/or where likelihood language is employed, what is the evidence that forms the basis for these assignments. Succinct descriptions in the chapter text of this type will both highlight the basis for ES findings and help explain the author team's assessment of the literature. The TSU is available to discuss any of the technical details related to these issues if that would be of use. (Michael Mastrandrea, IPCC WGII TSU) | We agree and will seek the advice of the TSU as the Executive Summary continues to evolve. |
| 36 | 42719 | 21 | 1 | 0 | 13 | 0 | I was struck by the lack of references up to this point. I think more effort is needed to give reader somewhere to go if possible to find further discussion of some of the points or for specific examples. (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | Agree. Including more references is being incorporated into the SOD. |
| 37 | 51170 | 21 | 2 | 32 | 0 | 0 | Executive Summary -- In subsequent work on the executive summary, the author team should further consider the following aspects of development: 1st, it would be preferable to present the paragraphs of the executive summary each with a key finding in bold text followed by explanatory non-bold text. 2nd, for each key finding and wherever else relevant, the author team should use calibrated uncertainty language to characterize its degree of certainty in these conclusions, considering summary terms for evidence and agreement, levels of confidence, and likelihood terms. 3rd, for each statement in the executive summary, the author team should provide line-of-sight citations to the supporting chapter sections in which a reader can find the corresponding traceable accounts. 4th, the author team should aim to shorten the executive summary in such a way that maintains big-picture, overarching conclusions, as well as findings and explanatory text that are meaningfully specific and nuanced. (Katharine Mach, IPCC WGII TSU) | Agree, and are taking these comments into accountin preparing the SOD Executive Summary. |
| 38 | 53414 | 21 | 2 | 46 | 2 | 50 | There also is the issue of geographic vs socioeconomic vulnerability. (Kristie L. Ebi, IPCC WGII TSU) | Agree |
| 39 | 36520 | 21 | 2 | 52 | 2 | 53 | It may be a matter of definition, but it is not clear that this Chapter will/should "assess" these issues that are primarily dealt with elsewhere in AR5 (e.g. the climate system components). Rather, it could about a thematic condensate, revisit of the underlying AR5 assessment in WGI or elsewhere in WGII or suchlike, as warranted as additional introdction to the regional WGII chapters. In many cases, there is quite a lot of text, but few supporting references. The aim could be more one of bridging rather than overly discussive. (M Rummukainen, SMHI) | We agree. In particular, the goal for the sections on physical sciences is not simply to repeat WGI results, but to synthesize the elements that are especially relevant to regional context. |
| 40 | 39974 | 21 | 2 | 53 | 2 | 53 | using 'include' implies information is missing. (Peter Burt, University of Greenwich) | The sentence has been changed. |
| 41 | 39975 | 21 | 3 | 19 | 3 | 20 | sentence does not make sense (Peter Burt, University of Greenwich) | The sentence has been edited. |
| 42 | 53415 | 21 | 3 | 20 | 3 | 24 | There also are co-harms from global trade. (Kristie L. Ebi, IPCC WGII TSU) | Agree |
| 43 | 53416 | 21 | 3 | 31 | 3 | 35 | Please define the baselines used. (Kristie L. Ebi, IPCC WGII TSU) | The paragraph referred to was a general discussion of the importance of all varieties of baselines. This section has been extensively revised in the SOD. |
| 44 | 48548 | 21 | 3 | 32 | 3 | 34 | 30 years for estimating decadal variability? The climatological convention of 30 years I think comes from two sources: a rule of thumb from statistics of needing at least 30 degrees of freedom to make estimates, applied to yearly data with the iid assumption; that climatological baselines started gaining importance in the 1990s and the increased monitoring following the IGY meant there were about 30 years of decent observational data. (Dáithí Stone, University of Cape Town) | Agreed. Not clear what adjustment needs to be made in the text to respond. |
| 45 | 49823 | 21 | 3 | 38 | 3 | 46 | While there has been someimprovement in the observations you ignore what they tell you. Recent temperature data show no signs of warming. Recent sea level data show no signs of a rise. You seem to want to exaggerate the importance of the old, least reliable data to justify your scare tactics. (Vincent Gray, Climate Consultant) | Disagree. These points are factually incorrect. |
| 46 | 36521 | 21 | 3 | 40 | 3 | 41 | Here one talks about "global reconstructions of weather sequences" and "climate reconstructions". If these refer to "reanalyses" (as in ERA, NCEP), perhaps use the term. Also, could delete "models" on line 42, as downscaling concerns results from models. (M Rummukainen, SMHI) | Agree. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 47 | 36522 | 21 | 3 | 43 | 3 | 45 | Depending on what "this information" means, the sentence may need revision. If reference is made to reanalyses, quite a lot of analysis has been done. If the reference is to historical CMIP simulations then reference should be made to WGI (M Rummukainen, SMHI) | Agree. |
| 48 | 48549 | 21 | 3 | 46 | 0 | 0 | They have increased the estimate of the uncertainties, but not the uncertainties themselves: the uncertainty was always there. (Dáithí Stone, University of Cape Town) | Point taken. |
| 49 | 36523 | 21 | 3 | 46 | 3 | 46 | Topography is not a regional forcing nor a new aspect in climate models. (Is resolution meant?) (M Rummukainen, SMHI) | The discussion should have identified topographic relief as a factor whose effect the models simulate more clearly as resolution is increased. |
| 50 | 53417 | 21 | 3 | 52 | 3 | 51 | Please define RCPs and CMIP5. (Kristie L. Ebi, IPCC WGII TSU) | Done. The chapter has been reorganized, though, and much of this definition is referred to in earlier chapters and in the glossary. |
| 51 | 49824 | 21 | 4 | 11 | 4 | 16 | The GCM projections have never successfully forecast any future climate. It is about time you gave them up and went back to the semi empirical methods of the weather forecasters. (Vincent Gray, Climate Consultant) | We are aware of the limitations of GCM's, but disagree with the conclusion of the reviewer. |
| 52 | 36524 | 21 | 4 | 15 | 4 | 16 | The overall relative merits of different methods of generating regional-scale climate information are rather well understood. Cf also the "General Guidelines on the use of Scenario Data for Climate Impact and Adaptation Assessment" from the IPCC DDC. (M Rummukainen, SMHI) | Agree. This section has been revised and clarified in the SOD. |
| 53 | 49825 | 21 | 4 | 22 | 4 | 26 | The SRES Scenarios are all obsolete. The assumptions of GDP growth are now completely different. The west is flounderoing and the east is progressing. Temperture records are unchanging for over ten years Methane levels are constant. The whole lot need to be replaced But you need to abandon all this stuff on greenhouse gases for which you have no evidence (Vincent Gray, Climate Consultant) | Disagree. |
| 54 | 36525 | 21 | 4 | 40 | 4 | 45 | Perhaps a reference to the D&A chapter of WGI? (M Rummukainen, SMHI) | Done. |
| 55 | 53418 | 21 | 5 | 5 | 5 | 8 | Reducing uncertainty in socioeconomic projections is even more challenging. (Kristie L. Ebi, IPCC WGII TSU) | It is not clear that this is a correct approach. Rather, socioeconomic scenarios are meant explicitly to address ranges of uncertainties, directly acknowledging that it may not be possible to reduce that uncertainty in human behavior. |
| 56 | 39976 | 21 | 5 | 19 | 5 | 19 | change 'were 'to 'was' (Peter Burt, University of Greenwich) | Done |
| 57 | 49826 | 21 | 5 | 19 | 5 | 20 | It is true what you say that you have no firm opinions on local changes. Why do you not leave it to the local people who know about ot. Recommendations to prepare for disasters for which local evidence provides no support should be discouraged. (Vincent Gray, Climate Consultant) | This is a value judgment on the reviewer's part. No response required. |
| 58 | 53419 | 21 | 5 | 19 | 5 | 45 | Please add something on extremes. (Kristie L. Ebi, IPCC WGII TSU) | Extremes are now treated explicitly in the SOD, in a way that is consistent with the SREX. |
| 59 | 35888 | 21 | 5 | 20 | 5 | 20 | "Improved regional scale information is now available." - In my oppinion it would be interesting to know, how these improvements have come about. (Wilhelm May, Danish Meteorological Institute) | Good point, we will be addrerssing the language associated with this in the reworking for the next draft. |
| 60 | 48550 | 21 | 5 | 34 | 5 | 36 | Again, the estimate of the uncertainties have increased, but the uncertainty itself has not necessarily changed. We could get Rumsfeldian here.... In terms of making *predictions* the uncertainty my have increased, but that would be because we might have been more confident in the future emissions profile seven years ago than we are now, given what has happened in the interim. (Dáithí Stone, University of Cape Town) | Good point. Editing and reorganization of the SOD will clarify our language. |
| 61 | 36526 | 21 | 5 | 35 | 5 | 35 | This would require a clarification and/or a good reference. Which local forcings are meant and what kind of increased uncertainty is meant? (M Rummukainen, SMHI) | Addressed in the SOD. |
| 62 | 51171 | 21 | 5 | 35 | 5 | 35 | "likely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | Noted. |
| 63 | 39977 | 21 | 6 | 4 | 6 | 4 | latitude/longitude? (Peter Burt, University of Greenwich) | Yes and yes. This has been clarified in the SOD. |
| 64 | 36527 | 21 | 6 | 7 | 6 | 7 | "Targets" sounds as something set in politics. Suggest "Levels" or suchlike expression. (M Rummukainen, SMHI) | Understood. This is a term that is in general use, though, in the mitigation (WGIII) literature. |
| 65 | 37041 | 21 | 6 | 9 | 6 | 14 | This paragraph does not recognize indirect effects. Putting a price on GHG emitted by land-use can lead to unfavourable conditions if the attribution of e.g. replacement effects is not part of the assessment and /or if sectoral boundaries are not resolved. For example, wood removed from mid-latitude managed forests has a mean replacement effect of 2.1 (Sathre, R. and J. O'Connor (2010). "Meta-analysis of greenhouse gas displacement factors of wood product substitution." Environmental Science & Policy 13(2): 104-114). Reducing the use of wood through increasing its price would thus increase emissions and if no reconciliation between sectors (LULUCF vs. Industry, Energy) is achieved the net effect of complete C pricing may very well be negative for mitigation purposes. (Joachim Rock, Johann Heinrich von Thuenen-Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries) | The work referenced takes these considerations into account. This is an active area of research, and is further elaborated in WGIII. |
| 66 | 53420 | 21 | 6 | 9 | 6 | 14 | References are needed. (Kristie L. Ebi, IPCC WGII TSU) | Noted and addressed in the SOD. |
| 67 | 53421 | 21 | 6 | 21 | 6 | 33 | Please double check consistency with the adaptation chapters and chapter 12. (Kristie L. Ebi, IPCC WGII TSU) | The SOD has extensive cross-referencing with adaptation and regional chapters. |
| 68 | 53422 | 21 | 6 | 23 | 6 | 25 | But there are general factors that increase vulnerability, such as poverty, access to resources, etc. (Kristie L. Ebi, IPCC WGII TSU) | Agree. Extensive editing in the SOD clarifies our approach to vulnerability. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 69 | 53423 | 21 | 6 | 42 | 6 | 42 | Also, socioeconomic information. (Kristie L. Ebi, IPCC WGII TSU) | Agree. Extensive editing in the SOD clarifies our approach to vulnerability. |
| 70 | 53424 | 21 | 6 | 51 | 6 | 54 | Also, demographics. (Kristie L. Ebi, IPCC WGII TSU) | Agree. Extensive editing in the SOD clarifies our approach to vulnerability. |
| 71 | 36528 | 21 | 6 | 52 | 6 | 52 | Are "extremes" to be understood as in "in general/overall" or as in "changes in extremes due to climate change"? (M Rummukainen, SMHI) | In this sentence, the latter. Clarified in the SOD. |
| 72 | 53425 | 21 | 7 | 1 | 7 | 10 | There also are the consequences of choices made. (Kristie L. Ebi, IPCC WGII TSU) | Yes, but these are less well-understood in the context of this chapter. |
| 73 | 36529 | 21 | 7 | 16 | 7 | 16 | Suggest "regional-to-local" instead of "assuredly local". Some phenomena are characteristically regional in extent, rather than local. (M Rummukainen, SMHI) | Revised as suggested, but retained "assuredly" |
| 74 | 35063 | 21 | 7 | 25 | 0 | 26 | I suggest to rephrase "…regardless of whether it is anthropogenic or natural". It can be misleading. (Ramon de Elia, Ouranos consortium) | This paragraph has been removed |
| 75 | 51172 | 21 | 7 | 36 | 0 | 0 | Box 21-1. In this box, the author team might also consider cross-referencing the working group 1 contribution to the 5th assessment report. (Katharine Mach, IPCC WGII TSU) | We have revised the table to include reference to the WG I and III reports, which will be refined ahead of the FGD |
| 76 | 36530 | 21 | 8 | 34 | 8 | 36 | This sentence could be omitted as being rather discussive. (M Rummukainen, SMHI) | The sentence has been shortened. |
| 77 | 53426 | 21 | 8 | 37 | 8 | 37 | Another category is defining vulnerability based on socioeconomics, such as the World Bank regions. The LDCs have many similarities because of their socioeconomic situations. (Kristie L. Ebi, IPCC WGII TSU) | We agree, and have added a new category labelled "adaptive capacity" to cover the angle of social vulnerability |
| 78 | 36531 | 21 | 8 | 44 | 8 | 48 | Could also refere to the WGI Atlas and Chapter 14. (M Rummukainen, SMHI) | The map has now been redrawn, and may not include climate regions. We already reference the atlas extensively in the chapter, so including a mention in the caption here is probably surplus to needs. |
| 79 | 43703 | 21 | 8 | 53 | 0 | 0 | The links between the WG2 and WG3 reports do not yet seem to be covered clearly in this draft and I am a bit surprised that the chapter sets the ambitious goal for covering all these dimensions. If that can be done, then congratulations, but after reading some of the following regional chapters I can not see this approach being used there and they are so limited in length that some are having difficulty in covering the adaptation aspects, let alone mitigation as well. (Martin Manning, Victoria University of Wellington) | We agree with the reviewer that there is limited scope to reflect mitigation issues and links to WG III either in this chapter or in the regional chapters. However, we have tried to bring in mitigation issues in this chapter where they are judged to be important. Furthermore, we now cite several WG III chapters directly in the text. |
| 80 | 48551 | 21 | 8 | 53 | 9 | 1 | Quite a remit. Kudos for taking it on! (Dáithí Stone, University of Cape Town) | The text has been revised to reflect the more pragmatic and less aspirational approach to regional assessment we have adopted in the chapter |
| 81 | 36532 | 21 | 9 | 1 | 9 | 7 | The second and the last sentence in this paragraph feel rather "discussive" and could be rewritten or omitted in part. (M Rummukainen, SMHI) | These two sentences have been revised slightly, but we feel that the issues need to be raised here. |
| 82 | 43704 | 21 | 9 | 21 | 0 | 0 | Mickwitz et al 2009 is not given in the list of references. Presumably it is: Per Mickwitz, et al. 2009. Climate Policy Integration, Coherence and Governance. PEER Report No 2. Helsinki: Partnership for European Environmental Research. http://www.peer.eu/fileadmin/user_upload/publications/PEER_Report2.pdf . But also I think that Figure 21-1 could be modified by the LAs so as cover the wider range of circumstances being addressed across the WG2 report. (Martin Manning, Victoria University of Wellington) | This figure has been extensively revised and converted into a Table, but is still based on the Mickwitz et al. concept. The reference is now correctly listed. |
| 83 | 36533 | 21 | 9 | 21 | 9 | 22 | Why are "Agencies" not depicted for the Traffic and Technology Policy levels? (Note that the reference to Mickwitz (M Rummukainen, SMHI) | Agencies are depicted prominently in the row of the table denoting National actors. |
| 84 | 53427 | 21 | 9 | 21 | 9 | 22 | NGOs also are important actors. (Kristie L. Ebi, IPCC WGII TSU) | This figure has been extensively revised and converted into a Table, with NGOs added to all columns |
| 85 | 36534 | 21 | 9 | 25 | 9 | 38 | Please check the status of the Belarus and Turkey (ratification done?). Of the Annex I countries, also Canada (recently) and the US are sort of exceptions. (M Rummukainen, SMHI) | This text is now part of supplementary material and will be checked thoroughly ahead of the FGD |
| 86 | 53428 | 21 | 9 | 35 | 9 | 38 | I read this week that there are now 35 LDCs. Please ensure consistency with chapter 13. (Kristie L. Ebi, IPCC WGII TSU) | There are now 49 LDCs according to the official UNOHRLLS site (checked 1 March 2013) |
| 87 | 36535 | 21 | 10 | 14 | 10 | 14 | "global agreement to come into effect" feels somewhat unclear. These are global agreement and in force. Perhaps, "… require global agreement to come into being". Alternatively, change "agreement" to "national ratification". (M Rummukainen, SMHI) | Moved to supplemenatary material and revised to reflect these suggestions: "…required global agreements to come into force, …" |
| 88 | 36536 | 21 | 10 | 44 | 10 | 45 | Please check if this is sufficiently precise. The information on the GCF Board is: "The Board will have 24 members, composed of an equal number of members from developing and developed country Parties. Representation from developing country Parties will include representatives of relevant United Nations regional groupings and representatives from small island developing States and least developed countries." See: http://gcfund.net/board/composition.html I.e., the basic delineation is develop and developing countries. Also, a possible alternative reference could be the GCF's homepage: gcfund.net (M Rummukainen, SMHI) | This section is now in supplementary material, but has been retained, as the information appears to be accurate and not in contradiction to the GCF information cited by the reviewer. We have cited the new web site referenced here. |
| 89 | 36537 | 21 | 11 | 5 | 11 | 5 | A matter of taste, perhaps, but the words "an interesting curiosity" is probably not needed. (M Rummukainen, SMHI) | Deleted from the revised text (now in supplementary material) |
| 90 | 46124 | 21 | 11 | 28 | 0 | 0 | This section should be highlighted in the report (especially lines 35 to 52). It should be up front and in the general executive summary. Also before that, the concepts of lines 1 to 18 in page 9. (Luis E. Garcia, World Bank) | This section on the policy-making context has now been moved up to the beginning of section 23.2. |
| 91 | 51174 | 21 | 11 | 35 | 11 | 54 | The author team should ensure clear referencing in support of statements made here. (Katharine Mach, IPCC WGII TSU) | References added, thanks. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| **92** | 38352 | 21 | 12 | 0 | 0 | 0 | On this page and throughout the chapter, there are a lot of organisational acronyms that should be spelt out. (Claire Goodess, University of East Anglia) | Good point, reduced acronyms, included full names where needed. |
| **93** | 51175 | 21 | 12 | 3 | 0 | 0 | Section 21.3.1.1. The author team should ensure full referencing of statements made in this section. (Katharine Mach, IPCC WGII TSU) | References added. |
| **94** | 53429 | 21 | 12 | 3 | 13 | 8 | Excellent summary. Please ensure consistency with the adaptation chapters. Also please add definitions of acronyms. (Kristie L. Ebi, IPCC WGII TSU) | Section shortened to avoid overlap with adaptation chapters; references added; acronyms removed or spelled out. |
| **95** | 36538 | 21 | 12 | 9 | 12 | 9 | "in the context of the UNFCCC" is unclear. Please provide a reference. If the reference is to the National Communications, then there is an overlap with the rest of the sentence. (M Rummukainen, SMHI) | Sentence changed to clarify |
| **96** | 53430 | 21 | 12 | 21 | 12 | 30 | References are needed. (Kristie L. Ebi, IPCC WGII TSU) | References added. |
| **97** | 48552 | 21 | 12 | 32 | 12 | 36 | It is a bit surprising not to see the EU listed here. Perhaps that's because it's gone so far as to mimic a national government? (Dáithí Stone, University of Cape Town) | Section shortened, list removed, so comment no longer applies |
| **98** | 51176 | 21 | 12 | 33 | 12 | 41 | For an unfamiliar reader, it would be helpful to introduce the acronyms used on lines 33-34 and 41. (Katharine Mach, IPCC WGII TSU) | Acrynyms removed of spelled out |
| **99** | 53431 | 21 | 12 | 36 | 12 | 36 | Yes (Kristie L. Ebi, IPCC WGII TSU) | Sentence removed during shortening. |
| **100** | 39978 | 21 | 12 | 41 | 12 | 41 | replace 1st 'and' with 'the' (Peter Burt, University of Greenwich) | Sentence modified during rewrite |
| **101** | 51177 | 21 | 13 | 11 | 0 | 0 | Section 21.3.1.2. The author team should ensure full referencing of statements made in this section. (Katharine Mach, IPCC WGII TSU) | Referencing added in modified section |
| **102** | 36539 | 21 | 13 | 13 | 13 | 16 | The UNFCCC is not really neither a project nor a plan. (M Rummukainen, SMHI) | Language modified during rewrite |
| **103** | 45109 | 21 | 13 | 15 | 0 | 29 | Very important discussion and one that could point to increasing the emphasis on decision-centred approaches that lead better to actual adaptation actions with a more iterative approach to planning at all scales (cf UKCIP: Willows, R. and Connell, R. Eds.) (2003). 'Climate Adaptation: Risk, Uncertainty and Decision-Making.' pp 166. (UKCIP: Oxford.)). In Australia, many users have become increasingly disenchanted with the Risk+Exposure=Impact+Adaptive Capacity=Vulnerability framing of earlier IPCC reports since it does not provide guidance on developing adaptation responses (but this remains dominant in the narrative of how to approach adaptation!). Increasingly decision-centred approaches are coming into use which focus on the areas of decision making first, swiftly iterate through impacts and vulnerabilities but only as a means to inform which areas of decision-making need more attention, and to develop adaptation options. This takes the focus away from a tendency to just work for more precision in the vulnerability indices rather than get into an adaptve management and learning cycle. There are many references for this, starting with UKCIP as above (but also e.g. Fig.2 in Meinke, H., Howden, S. M., Struik, P. C., Nelson, R., Rodriguez, D., and Chapman, S. C. (2009). Adaptation science for agriculture and natural resource management - urgency and theoretical basis. Current Opinion in Environmental Sustainability 1, 69-76) , and e.g. guidelines for South Australian Local Government about to be promulgated (as well as many others) which tend towards this approach, and the emerging PROVIA guidelines (http://www.provia-climatechange.org/ABOUT/PriorityActivities/Activity4/tabid/55274/Default.aspx). It would be useful with AR5 to make a strong framing statement about this issue. (Mark Stafford-Smith, Commonwealth Scientific and Industrial Research Organisation) | Thanks for the excellent comment. As noted, we have had to shorten this section, but certainly hope that this perspective still comes across clearly. Reference to UKCIP 2003 added. |
| **104** | 51178 | 21 | 13 | 15 | 13 | 15 | For an unfamiliar reader, it would be helpful to introduce at least the latter acronyms used on this line. (Katharine Mach, IPCC WGII TSU) | Sentence removed during shortening. |
| **105** | 39979 | 21 | 13 | 16 | 13 | 16 | Don't use 'etc', it is imprecise and tells the reader nothing! (Peter Burt, University of Greenwich) | Removed |
| **106** | 36540 | 21 | 13 | 18 | 13 | 24 | Here, the "climate proofing" concept could be interesting to mention, if it is assessed to have sufficient punch. One possible reference is "Bouwer and Aerts, 2006. Financing climate change adaptation. Disasters 30:1, 49-63." (M Rummukainen, SMHI) | Section has been shortened rather than extended -- this reference should be reflected in the adaptation chapters instead. |
| **107** | 53432 | 21 | 13 | 18 | 13 | 24 | A question is whether these activities are adaptation to climate change. (Kristie L. Ebi, IPCC WGII TSU) | Good point -- some would argue that this is the essence of adaptation, others that it is beyond it. Given the scope of the chapter, this section has actually been shortened, so if anywhere, this issue possibly merits further attention in the adaptation chapters. |
| **108** | 51179 | 21 | 13 | 37 | 0 | 0 | Section 21.3.1.3. The author team should consider further referencing of statements made in this section. (Katharine Mach, IPCC WGII TSU) | References added for shorter revised section |
| **109** | 35064 | 21 | 13 | 45 | 0 | 0 | Observed trends for short-term adaptation seem to me a dangerous advice to give. Twenty-year trends can be much more pronounced than models project --probably the consequence of natural variability-- and hence could be a much more agressive adaptation that needed if projected into the future. (Ramon de Elia, Ouranos consortium) | True -- the suggestion to base planning on 20-year trends was certainly not what was intended by the sentence. Rephrased and removed "recent" to avoid this impression. |
| **110** | 51180 | 21 | 14 | 1 | 0 | 0 | Section 21.3.1.4. The author team should ensure full referencing of statements made in this section. (Katharine Mach, IPCC WGII TSU) | References added for shorter revised section |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 111 | 45110 | 21 | 14 | 3 | 0 | 0 | I'm not sure this is really true any more - there is a great deal of planning and even implementation at the local government level, at least in developed countries. E.g. In Australia, there is a growing number of plans LGs: e.g. Kuring-gai NSW (http://www.kmc.nsw.gov.au/www/html/518-climate-change-adaptation-and-mitigation.asp), Penrith NSW (http://www.penrithcity.nsw.gov.au/uploadedFiles/Website/Sustainability/Greenhouse/Risk%20Assessment%20Report%20-%20Final%20Sep09.pdf), and many others - some reviewed in this doc (http://www.nccarf.edu.au/settlements-infrastructure/sites/www.nccarf.edu.au.settlements-infrastructure/files/ACCARNSI_STAGE%201%20REPORT_Case%20Studies%20of%20Adaptation%20Tools_Final_May%202012.pdf), others in this (http://www.climatechange.gov.au/what-you-can-do/~/media/publications/local-govt/localadaption_localgovernment.pdf) among other sources. (Mark Stafford-Smith, Commonwealth Scientific and Industrial Research Organisation) | Correct; Section has been rewritten, sentence removed/rephrased. |
| 112 | 46125 | 21 | 14 | 9 | 14 | 9 | Benefit-cost analysis is of little value for long-term impacts (Luis E. Garcia, World Bank) | Thanks, and it is indeed true that using benefit-cost analysis to guide decisions regarding long-term impacts is indeed difficult, but the decision-making contexts for these sort of decisions still often includes that framing -- this is actually part of the problem. Rephrased the sentence, added a reference, and referred to chapter 17 for further information. |
| 113 | 53433 | 21 | 14 | 9 | 14 | 13 | Please ensure consistency with chapter 2. (Kristie L. Ebi, IPCC WGII TSU) | Rephrased the sentence, added a reference, and referred to chatper 17 for further information. |
| 114 | 53434 | 21 | 14 | 15 | 14 | 17 | Please ensure consistency with chapter 17. (Kristie L. Ebi, IPCC WGII TSU) | Explicit reference to chapter 17 added to the paragraph. |
| 115 | 45111 | 21 | 14 | 28 | 0 | 0 | It would be helpful to review what different countries have focused on and why e.g. U.K. DEFRA risk assessment, US Assessment in progress, various EU countries, various NAPA approaches, etc (Mark Stafford-Smith, Commonwealth Scientific and Industrial Research Organisation) | This would indeed be interesting, but the section had to be shortened and this analysis is somewhat beyond the scope of this regional context chapter; this sort of analysis is to some extent covered in the adaptation chapters. |
| 116 | 51181 | 21 | 14 | 28 | 0 | 0 | Section 21.3.1.5. The author team should ensure full referencing of the statements made in this section. (Katharine Mach, IPCC WGII TSU) | References added for shorter revised section |
| 117 | 38353 | 21 | 14 | 37 | 14 | 38 | The same users can be interested in both near and longer-term - depending on whether they are considering operational or longer-term planning decisions. (Claire Goodess, University of East Anglia) | True, although the general emphasis is sometimes different for different user groups, but this statement was too general. Section revised. |
| 118 | 38355 | 21 | 14 | 45 | 0 | 0 | Should this section somewhere consider the question as to which 30-year baseline period should be used? The continuing used of 1961-90 is an issue for users - who often want to know how much of the future projected change has already occurred. (Claire Goodess, University of East Anglia) | Alluded to in new text. |
| 119 | 52091 | 21 | 14 | 48 | 14 | 50 | In introducing the concept of a baseline, the chapter team should also consider providing reference to the entry for the term in the glossary for the report. (Katharine Mach, IPCC WGII TSU) | Reference added. |
| 120 | 48553 | 21 | 14 | 50 | 14 | 52 | I think of a “historical” baseline as being one that includes (with recent variably defined) changes in the atmospheric composition. It also seems that CMIP5 does, because all of their “historical” simulations include varying atmospheric composition. (Dáithí Stone, University of Cape Town) | Agreed, text added. |
| 121 | 48554 | 21 | 15 | 8 | 15 | 9 | Required? It depends on the purpose, doesn't it? I hardly need 30 years of local data to tell me that Lagos does not need a local-sea-ice-retreat adaptation plan. I would also guess that much current developed world infrastructure was satisfactorily designed (for the present climate) without 30 years of reliable observational measurements. (Dáithí Stone, University of Cape Town) | Agreed, text added. |
| 122 | 38354 | 21 | 15 | 11 | 15 | 12 | For urban drainage, sub-daily timescales may need to be considered. (Claire Goodess, University of East Anglia) | Noted but not relevant, example given as a spatial resolution issue |
| 123 | 36541 | 21 | 15 | 12 | 15 | 12 | Are there areas where also "sub-daily" information would be needed (e.g. ecosystem modelling, urban hydrology)? (M Rummukainen, SMHI) | Yes and text added. |
| 124 | 39980 | 21 | 15 | 36 | 15 | 37 | space required between numbers and units (Peter Burt, University of Greenwich) | Agreed, text added. |
| 125 | 36542 | 21 | 16 | 5 | 16 | 25 | The regional E-OBS database could be mentioned here. Please see http://eca.knmi.nl/download/ensembles/ensembles.php for literature references. (M Rummukainen, SMHI) | The text was meant to provide representative examples not an exhaustive list |
| 126 | 35065 | 21 | 16 | 14 | 0 | 0 | Some plublished articles indicate the risks of using reanalysis for estimating trends as discussed in page 22 line 4 of this document, and probably solid baselines in the far past. . Bengtsson L, Hagemann S, Hodges KI (2004) Can Climate Trends be Calculated from Re-Analysis Data ? JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 109, D11111, 8 PP., 2004 (Ramon de Elia, Ouranos consortium) | Reference to observed trends removed. |
| 127 | 39981 | 21 | 16 | 20 | 16 | 20 | change 'Forcasting' to 'Forecasts' (Peter Burt, University of Greenwich) | Done |
| 128 | 36543 | 21 | 16 | 25 | 16 | 25 | The reference is missing from the references list. ("International Innovation" of researchmedia.eu? If so, perhaps a better reference could be found, if there indeed already are results available as the FOD-text would seem to suggest. (M Rummukainen, SMHI) | Reference changed. |
| 129 | 36544 | 21 | 16 | 33 | 16 | 34 | SOCOL is probably not very well known. A reference is certainly needed (perhaps Atmos. Chem. Phys., 8, 7755–7777, 2008). Also, the Brönnimann references seem to be missing from the reference list. (M Rummukainen, SMHI) | Caption changed to clarify. |
| 130 | 39982 | 21 | 16 | 35 | 16 | 35 | et al. (Peter Burt, University of Greenwich) | Caption changed to clarify. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 131 | 48555 | 21 | 16 | 37 | 16 | 38 | In the rest of this paragraph you are only referring to spatial resolution, not high resolution in time or in meteorological quantities, etc. This assumption of resolution being something only involving space is sprinkled elsewhere in this chapter too. (Dáithí Stone, University of Cape Town) | Agreed, text added. |
| 132 | 36545 | 21 | 16 | 40 | 16 | 40 | Suggest that more recent references are located and used. The situation may well still persist, but it would be useful to note whether the later developments (see on the same page, lines 5-25…). (M Rummukainen, SMHI) | Reference updated (one still relevant). |
| 133 | 35066 | 21 | 16 | 42 | 0 | 0 | Dynamical downscaling adds fine scales but in same cases --especially in large domains like North-America or Africa-- temporal correlations between simulated data and observations is low, particularly for precipitation. So in many cases detail is added but the time series is often not usable as a quasi-reanalysis, although statistics could be of use. (Ramon de Elia, Ouranos consortium) | Agreed, issue addressed in assessment of reliability later in the section. |
| 134 | 36546 | 21 | 16 | 43 | 16 | 44 | Could add a reference on a RCM overview: Rummukainen, 2010. State-of-the-art with regional climate models, Wiley Interdisciplinary Reviews: Climate Change, 1:1, 82-96. DOI: 10.1002/wcc.8, as well as make a general reference to AR5/WGI/Chapter 9.6 (M Rummukainen, SMHI) | WG1 reference added. |
| 135 | 42720 | 21 | 16 | 49 | 17 | 6 | Some examples of the newer approach (at least) would be good. (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | Reference added. |
| 136 | 38356 | 21 | 17 | 4 | 17 | 6 | I'm not sure I fully understand what is being got at here. Perhaps include an example of the aspects of climate variability that are referred to. (Claire Goodess, University of East Anglia) | Reference added. |
| 137 | 36547 | 21 | 17 | 29 | 17 | 29 | "Representative Concentration Pathways" (M Rummukainen, SMHI) | Corrected. |
| 138 | 36548 | 21 | 17 | 40 | 17 | 41 | The same (baseline continually evolving) could be said about the climate. One could argue that a reference state (be it a period, prolongedly stable or not, or a point in time) can always be defined. Also, a baseline, depending on the purpose, could also be a reference development pathway. Any references? (M Rummukainen, SMHI) | Agreed, text modified. |
| 139 | 48556 | 21 | 17 | 40 | 17 | 41 | There may be a link here with Chapter 18, who note the challenge of a practical definition for detection of impacts for this very reason. (Dáithí Stone, University of Cape Town) | Relevant text removed in response to other comments. |
| 140 | 37710 | 21 | 17 | 45 | 0 | 0 | Comment 1: I think this section falls short of providing a foundation for the baseline, including its implications, limitations, and generalization, Add(?): It is not necessarily required that the baseline be a valid projection of the future condition, such as the GDP, when it comes to assessing the impact of climate change on policy decisions. Referent projections, agreeable to policy makers, allow analyses that determine the impact of climate change relative to the referent. Because future climate conditions may have precedence in recorded history, simulation models assessing the impacts may be operating in interpolative regimes that have much more validity than when the operating in extrapolative regimes where there is no historical precedence. Additionally, referents can include uncertainty intervals that can quantify the sensitivity of the impact analyses to the uncertainty in the non-climate baselines. (George Backus, Sandia National Laboratories) | Agreed, some text and references added. |
| 141 | 37711 | 21 | 17 | 45 | 0 | 0 | Comment 2: There may be a modeling or historical basis for estimating the range of uncertainty, but even judgmental estimates can aid in establishing the level of sensitivity. When using a baseline, it is important to recognize that the impact in one area, for example a specific industry such as electric utilities, can have cascading effects on other economic and ecological domains. Sandia National Laboratories demonstrated the use of non-climatic baseline in a risk assessment of climate impact among interacting sectors and regions over time and with uncertainty (Backus et al., 2012) [Backus, G., T. Lowry, and D. Warren, 2012: The near-term risk of climate uncertainty among the U.S. states. Climatic Change, Online First 23 June 2012. Doi: 10.1007/s10584-012-0511-8] (George Backus, Sandia National Laboratories) | Agreed, some text and references added. |
| 142 | 39983 | 21 | 17 | 49 | 17 | 49 | insert , after 'Generally' (Peter Burt, University of Greenwich) | Corrected. |
| 143 | 53435 | 21 | 17 | 49 | 17 | 51 | Not really. Many sectors have always defined vulnerability using non-climate factors. (Kristie L. Ebi, IPCC WGII TSU) | Agreed, text modified. |
| 144 | 36549 | 21 | 18 | 36 | 0 | 0 | Suggest a general reference to AR5/WGI/Chapter 9.6 (M Rummukainen, SMHI) | Agreed text modeified |
| 145 | 39984 | 21 | 18 | 45 | 18 | 45 | bad English. Don't start sentence with 'But' (Peter Burt, University of Greenwich) | Corrected |
| 146 | 38357 | 21 | 18 | 46 | 0 | 0 | Since AR4 there has been growing interest in and use of general bias correction methods - and a few papers showing improvements in impacts (mainly hydrological) modelling when using RCM bias corrected data. WG I chapter 9 includes some text on this. (Claire Goodess, University of East Anglia) | Bias correction is used with global models as well, so it isn't specific to regional models. We do point to chapter 9 where the issue is discussed. |
| 147 | 36550 | 21 | 18 | 53 | 18 | 54 | This could warrant more assessment. The overall relative merits of different methods of generating regional-scale climate information are rather well understood. Cf also the "General Guidelines on the use of Scenario Data for Climate Impact and Adaptation Assessment" from the IPCC DDC. (M Rummukainen, SMHI) | While there have been many reports etc. that document different downscaling methods, for the most part these provide comparisons, not evaluations. Space considerations preclude reiterating this material in this chapter. |
| 148 | 47218 | 21 | 18 | 53 | 18 | 54 | On the 'merits' of finer resolution for climate change signal over North America, see Di Luca, Alejandro, de Elia, R. and Laprise, R. (2012) Potential for small scale added value of RCM's downscaled climate change signal, Climate Dynamic, DOI 10.1007/s00382-012-1415-z. (Diane Chaumont, Ouranos) | We are aware of this research and others that discuss added value. Space considerations preclude a more eleborate further discussion of this point. This issue is also discussed in a more general sense in section 21.4. We also point to section 9.6 in WG1 |
| 149 | 53436 | 21 | 18 | 54 | 18 | 54 | Is there a recommendation? (Kristie L. Ebi, IPCC WGII TSU) | No, there is not |
| 150 | 36551 | 21 | 19 | 3 | 0 | 0 | The first line of the paragraph mentions "… now use", but the provided references are from 2004, which may seem as a discrepancy. (M Rummukainen, SMHI) | More recent literature is cited in the paragraph, and we feel this is sufficient. |
| 151 | 38358 | 21 | 19 | 12 | 19 | 13 | McCarthy et al don't really consider population or urban area increases, rather the influence of urban areas at the sub-grid scale and anthropogenic heat releases over urban areas. (Claire Goodess, University of East Anglia) | Thanks for the correction - reference removed |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| **152** | 38359 | 21 | 19 | 14 | 0 | 0 | PESETA not PRESETA (Claire Goodess, University of East Anglia) | spelling of acronym corrected |
| **153** | 36552 | 21 | 19 | 14 | 19 | 14 | Is "PESETA" referred to? (M Rummukainen, SMHI) | Yes, spelling corrected from above |
| **154** | 53437 | 21 | 19 | 27 | 19 | 47 | Much of this is already in chapter 1. You can refer to chapter 1 and reduce the amount here. If you choose to keep this here, please ensure consistency with chapter 1. (Kristie L. Ebi, IPCC WGII TSU) | This section has been replaced with an overview box. |
| **155** | 39985 | 21 | 19 | 33 | 19 | 33 | change 'gasses' to 'gases' (Peter Burt, University of Greenwich) | corrected |
| **156** | 36553 | 21 | 19 | 40 | 19 | 40 | Perhaps unclear. Are the "explicit" strategies more in the SSP's remit rather than in the RCPs? The latter, certainly, include a case (RCP2.6 and its variant) which may align itself with a stabilisation regime. (M Rummukainen, SMHI) | This section has been replaced by a box that addressed this point. |
| **157** | 48557 | 21 | 19 | 50 | 0 | 0 | Are your “stressors” identical to the “drivers” of Chapter 18, or is there a difference? To me a stressor has to stress a system, whereas a driver could allow a system to either relax or stress. (Dáithí Stone, University of Cape Town) | This section has been combined with the section on multiple elements. In chapter 18 drivers appear to mean factors that can cause systems to change. In our chapter 'stressor' refers to a factor that causes stress on a system, presumably a negative change. Neither term is defined in the FOD Glossary. They should be |
| **158** | 47219 | 21 | 20 | 0 | 21 | 0 | Significant effort and progress have been made during the last years to bridge the gap between climate model output and tools commonly used to assist in decision making. For example, methods of post-processing climate model output (Maraun, D., Wetterhall, F., Ireson, A. M., Chandler, R. E., Kendon, E. J., Widmann, M., Brienen, S., Rust, H. W., Sauter, T., Themeßl, M., Venema, V. K. C., Chun, K. P., Goodess, C. M., Jones, R. G., Onof, C., Vrac, M., and Thiele-Eich, I.: Precipitation downscaling under climate change: Recent developments to bridge the gap between dynamical models and the end user, Rev. Geophys., 48, RG3003, 10.1029/2009rg000314, 2010; Teutschbein, C., and Seibert, J.: Regional Climate Models for Hydrological Impact Studies at the Catchment Scale: A Review of Recent Modeling Strategies, Geography Compass, 4, 834-860, 10.1111/j.1749-8198.2010.00357.x, 2010; Chen, J., Brissette, F.P., Chaumont, D. and Braun, M., Uncertainty of empirical downscaling methods in quantifying the climate change impacts on hydrology over two Northa American river basins, submitted to Journal of Hydrology), assessment of the methods commonly used to produce spatial analogues scenarios, these being, according to the decision makers, very useful (Grenier P., A.-C. Parent, D. Huard, F. Anctil and D. Chaumont. Assessment of six dissimilarity metrics for climate analogues. Submitted to Journal of Applied Meteorology and Climatology), evaluation of hydrological models used in decision making in the context of climate change (Velázquez, J. A., Schmid, J., Ricard, S., Muerth, M. J., Gauvin St-Denis, B., Minville, M., Chaumont, D., Caya, D., Ludwig, R. and Turcotte, R.: An ensemble approach to assess hydrological models' contribution to uncertainties in the analysis of climate change impact on water resources, Hydrol. Earth Syst. Sci. Discuss., 9, 7441-7474, 2012). Some references to these publications would help to continue the progress in this area. (Diane Chaumont, Ouranos) | The section on applications of scenarios has been broken up and placed in various other sections. Space considerations preclude our having an extended discussion of the issues you bring up. However, we now include some of the references you list here that connects to post-processing and connecting with the user. We also point to chapter 9.6 where added value of downscaling methods are discussed in the section on high-resolution scenarios. |
| **159** | 53438 | 21 | 20 | 4 | 20 | 12 | You can just refer to the chapter sections. (Kristie L. Ebi, IPCC WGII TSU) | Not clear what is meant by comment |
| **160** | 51182 | 21 | 20 | 9 | 20 | 9 | "likely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | Term removed |
| **161** | 48558 | 21 | 20 | 17 | 0 | 0 | Again with the stressor. I suppose access to education could stress, but I'm guessing lack of access is the issue, and the stressor, here. I may not be familiar enough with the terminology in this area (is stressor in the glossary?), but I'm finding myself a little stressed over how stressor is being used here. (Dáithí Stone, University of Cape Town) | To make this point clearer we have changed the term to 'lack of' access. These can read as factors, which when 'negative' lead to stress |
| **162** | 48559 | 21 | 20 | 17 | 20 | 18 | Okay, I think I am in fact on to something. While I'm sure we could come up with some convoluted case, for the most part I'm sure no one is concerned about the impacts of access to water, while I expect they could be concerned about the impacts of a lack of access to water. (Dáithí Stone, University of Cape Town) | Agreed |
| **163** | 36554 | 21 | 20 | 40 | 20 | 40 | Is there a special reason why the NPCC is mentioned? Does it have the same attributes (one of the most complete…) in an international comparison? Various case studies in "Local Sustainability Volume 2, 2012, DOI: 10.1007/978-94-007-4223-9" may offer some additional information and of course there are an increasing number of other cities where adaptation is now being considered (larger Nordic countries, e.g. Copenhagen, Stockholm, Gothenburg). (M Rummukainen, SMHI) | This case and related statements have been removed. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 164 | 42721 | 21 | 21 | 1 | 21 | 38 | The Climate Futures Tasmania project would also be a good example from a rather different part of the world to include here. Six GCMs were downscaled with the CCAM stretched grid model and the results used in a coordinated set of impact studies. See http://www.dpac.tas.gov.au/divisions/climatechange/adapting/climate_futures Some references from this follow and I will ask the authors to send pre-publication manuscripts to you: White CJ, McInnes KL, Cechet RP, Corney SP, Grose MR, Holz GK, Katzfey JJ, Bindoff NL 2012, On regional dynamical downscaling for assessing and projecting future temperature and precipitation extremes. Submitted to: Climate Dynamics Grose MR, Corney SP, Katzfey JJ, Bennett JC, Holz GK, White CJ, Bindoff NL 2012, A regional response in mean westerly circulation and rainfall to projected climate warming over Tasmania, Australia. Climate Dynamics, DOI 10.1007/s00382-012-1405-1 Grose MR, Pook MJ, McINtosh PC, Risbey JS, Bindoff NL 2012, The simulation of cutoff lows in regional climate models: reliability and projected trends. Climate Dynamics, 39: 445-459 Bennett JC, Ling FLN, Post DA, Grose MR, Corney SP, Graham B, Holz GK, Katzfey JJ, Bindoff NL 2012, High-resolution projections of surface water availability for Tasmania, Australia. Hydrol. Earth Syst. Sci., 16:1287-1303 Grose MR, Barnes-Keoghan I, Corney SP, White CJ, Holz GK, Bennett JC, Gaynor SM Bindoff NL 2010, Climate Futures for Tasmania: general climate technical report. Antarctic Climate and Ecosystems Cooperative Research Centre, Hobart. Grose MR, Corney SP, Katzfey JJ, Bennett JC, Bindoff NL 2011, Improving projections of rainfall trends through regional climate modelling and wide-ranging assessment. MODSIM International Congress 2011 Corney S, Katzfey J, McGregor J, Grose MR, Holz GK, White CJ, Bennett JC, Gaynor SM, Bindoff NL 2010, Improved regional climate modelling through dynamical downscaling. IOP Conference Series: Earth and Environmental Science, 2010 (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | We have described this project and included a couple of these references |
| 165 | 36555 | 21 | 21 | 5 | 21 | 5 | A better reference to the RCM scenarios of the ENSEMBLES project would be Déqué et al. 2012, The spread amongst ENSEMBLES regional scenarios: regional climate models, driving general circulation models and interannual variability, albeit there are earlier articles. The Christensen 2010 is not about the ENSEMBLES RCM scenarios as such. For example, a corresponding chapter in the ENSEMBLES final report, as the Morse et al. used as a reference in this same paragraph. (M Rummukainen, SMHI) | We are using the Christensen reference as a basic one for the scenarios, but we are happy to add Deque et al. 2012) |
| 166 | 36556 | 21 | 21 | 16 | 21 | 16 | "United Kingdom Climate Program" may be a wrong characterisation of the UKCIP. (M Rummukainen, SMHI) | But it is the proper defintion of UKCP |
| 167 | 38360 | 21 | 21 | 16 | 21 | 23 | Could mention the UKCP09 weather generator here and refer to Figure 21.3. A more comprehensive example of the application of UKCP09 is the UK Climate Change Risk Assessment http://www.defra.gov.uk/environment/climate/government/risk-assessment/ (Claire Goodess, University of East Anglia) | We do not have the space to add this level of detail |
| 168 | 48560 | 21 | 21 | 25 | 0 | 0 | Climate scenarios or emissions scenarios? (Dáithí Stone, University of Cape Town) | We mean climate scenarios here, as stated. |
| 169 | 36557 | 21 | 21 | 28 | 21 | 28 | Suggest "climate projections" instead of "climates". (M Rummukainen, SMHI) | Accepted |
| 170 | 36558 | 21 | 21 | 29 | 21 | 31 | A possible reference could be "Fronzek et al. Climatic Change 99:3-4, 515-534". (M Rummukainen, SMHI) | We already have a reference for the use |
| 171 | 36559 | 21 | 21 | 36 | 21 | 38 | The references are from 2010. Have impact studies come about from CLARIS? (M Rummukainen, SMHI) | *They have not yet, but are still planned, I believe |
| 172 | 38361 | 21 | 21 | 36 | 21 | 38 | Actually there are two projects - CLARIS finished a while ago. The CLARIS-LPB project will finish in September - but does not specifically include a dengue fever application (was cut from proposal for budget reasons!) (Claire Goodess, University of East Anglia) | *My understanding is that some simulations may still be used for a dengue study - will try to verify |
| 173 | 45112 | 21 | 21 | 41 | 0 | 0 | NB note the importance of the appropriate presentation of regional/local downscaled climate projections for different uses, within consistent framing at national levels - eg. Climate Futures approach being developed by Whetton et al (cf. Whetton, P., Hennessy, K., Clarke, J., McInnes, K., and Kent, D. (2012). Use of Representative Climate Futures in impact and adaptation assessment. Climatic Change in press) (Mark Stafford-Smith, Commonwealth Scientific and Industrial Research Organisation) | Agreed but do not see how this is relevant in this section. |
| 174 | 48561 | 21 | 21 | 41 | 0 | 0 | Missing from this section is the baseline in external drivers (forcings, stressors, whatever) of the climate system. (Dáithí Stone, University of Cape Town) | This is a WG1 issue and thus not relevant in WG2 |
| 175 | 38362 | 21 | 21 | 49 | 0 | 0 | Error estimates were also produced for the E-OBS dataset - but in practice have not been used. (Claire Goodess, University of East Anglia) | Noted but not relevant as only providing examples, not an exhaustive review |
| 176 | 38363 | 21 | 22 | 21 | 0 | 0 | Perhaps it would be better to say 'more' accurate (Claire Goodess, University of East Anglia) | Agreed, statement qualified. |
| 177 | 35067 | 21 | 22 | 24 | 0 | 0 | section 21.3.4.1.1: I find it a bit confusing to have this section apart from section 21.3.2.1. Some issues that I found incomplete in the earlier section are well explained in the other. (Ramon de Elia, Ouranos consortium) | Agreed, material now collected in new section 21.5.3.1 |
| 178 | 38364 | 21 | 23 | 1 | 0 | 0 | Should there be some discussion somewhere of uncertainties relating to impacts modelling? Focusing on the regional aspects. One of which is that different methods/models etc tend to be used which makes inter- and intra- regional comparisons difficult. More general issues relate to the lack of impacts model ensemble approaches etc. (Claire Goodess, University of East Anglia) | Yes, a section on this has been added |
| 179 | 36560 | 21 | 23 | 11 | 23 | 11 | Suggest "… aerosols, and other short-lived species…" (M Rummukainen, SMHI) | Corrected |
| 180 | 35068 | 21 | 23 | 16 | 0 | 0 | "to predict how the entire world will develop in the future is a daunting task... " Even though the phrase is strong it seems to me still and understatement. I would say something like "unfortunately predicting the emissions of GHG is tauntamount to predict the future of humanity". (Ramon de Elia, Ouranos consortium) | The phrase we have essentially communicates the same thing. Not all aspects of the future are equally impossible to predict. |
| 181 | 39986 | 21 | 23 | 17 | 23 | 17 | why is GDP defined but almost no other acronyms are? (Peter Burt, University of Greenwich) | The other acronyms in this paragraph are defined earlier in the chapter |
| 182 | 35069 | 21 | 23 | 21 | 0 | 0 | It may need to be clarified that equal plausibility need not mean equal probability. The issue of assigning probabilities to the SRES is controversial. This is briefly mentioned in FAQ 12.1 of WGI and discussed in many publications. For example Stott and Forest 2007 Ensemble climate predictions using climate models and observational constraints.Phil. Trans. R. Soc. A (2007) 365, 2029–2052. Maybe instead of "having equal plausibility" it could be just said "plausible scenarios". (Ramon de Elia, Ouranos consortium) | Equal plausibility indeed does not mean necessarily equally probable. The issue is discussed in the cited literature (Parson et al.) for those wanting more information. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 183 | 53439 | 21 | 23 | 23 | 23 | 23 | I believe you mean Arnell not Adger. (Kristie L. Ebi, IPCC WGII TSU) | Corrected |
| 184 | 36561 | 21 | 23 | 35 | 23 | 35 | Suggest "… the same radiative forcing or atmospheric composition" to mark the difference between the CMIP5 and CMIP3. (M Rummukainen, SMHI) | Added |
| 185 | 35070 | 21 | 23 | 41 | 0 | 0 | It is unclear why having a carbon cycle will reduce uncertainty regarding final concentrations. My impression is that this will eliminate the model error component of concentrations but these will still suffer the intractable uncertainty of future emissions. (Ramon de Elia, Ouranos consortium) | We have altered the statement so that the assumption of reduction of uncertainty is no longer made |
| 186 | 36562 | 21 | 23 | 41 | 23 | 42 | Please check the validity of "Most models now have fully closed carbon and nitrogen cycles". (M Rummukainen, SMHI) | Checked - replaced nitrogen cycle with DVGMs |
| 187 | 38365 | 21 | 23 | 42 | 0 | 0 | I'm not sure that this really 'reduces' the uncertainties - if anything it widens the spread of uncertainty. (Claire Goodess, University of East Anglia) | Changed as indicated above |
| 188 | 35440 | 21 | 23 | 44 | 0 | 0 | I think it is arguable whether to include glacier and ice sheet dynamics explicitly in CMIP5 would be desirable, or sensible at this point in time. And whether the fact that they are not included in the models, is responsible for the wide uncertainty in sea-level projections. At present the uncoupled approach to glacier and ice-sheet projection makes most sense to much of the community (www.ice2sea.eu and US-Searise). I think it will be a long time before IPCC models include explicit glacier and ice dynamics. (David Vaughan, British Antarctic Survey) | We do not say the CMIP5 models should have included these sub-models. It is an example of the incompleteness of the ESMs. We do not say that this causes greater uncertainty in SLR estimates. We have added a sentence indicating that off-line calculations are used and are useful. |
| 189 | 36563 | 21 | 23 | 47 | 23 | 47 | This, sort of, presupposes the occurrence of the collapse of the GIS (under current and foreseen anthropogenic climate regimes). GIS simulations are done, if not with the AOGCMs. (M Rummukainen, SMHI) | Our point is simply to use the total collapse of the GIC as an extreme event that may not be predictable. |
| 190 | 36564 | 21 | 23 | 54 | 23 | 54 | Could add "in some regions and/or some aspects" so as not to risk confusing with the global-scale change. (M Rummukainen, SMHI) | Section has been moved and reconfigured - regional now modifies. |
| 191 | 42722 | 21 | 24 | 1 | 24 | 2 | Yes, but this also has a flip side. In areas of high natural variability, large changes (and ones potentially important in impact terms) may be being projected by models even though they dont pass a test of statistical significance. It is not clear (if one is taking a risk management framework) that only significant projected changes should be considered. (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | This is a tricky issue. In the context where we are discussing this, the statsitical significance point is an important one to make. |
| 192 | 36565 | 21 | 24 | 16 | 24 | 16 | Here one would appreciate a more recent reference, as the models assessed in 2005 are few generations back in time. (M Rummukainen, SMHI) | More recent references (e.g., 2010) addressing the same point are also included |
| 193 | 38366 | 21 | 24 | 22 | 0 | 0 | see Barkhordarian, A., von Storch, H and Hhend, J. The expectation of future precipitation change over the Mediterranean region is different from what we observe. Climate Dynamics - probably now accepted for publication. (Claire Goodess, University of East Anglia) | There is no reference to the Mediterranean in this section. We already provide an example of the case we are discussing. |
| 194 | 48562 | 21 | 24 | 22 | 24 | 28 | This could be a good opportunity for a lesson on field significance: given probabilistic predictions, there is *supposed to be* somewhere where the prediction will be wrong. (Dáithí Stone, University of Cape Town) | Yes, this is true, but not relevant to the main point we address here |
| 195 | 36566 | 21 | 24 | 23 | 24 | 23 | The recent regional cooling trend is not very evident in the AR4 maps (Figure 3.9b of WG I). "Recent" would need a closer specification. Some recent references are "Christidis et al. 2010, Climate Dynamics 34, 1130-1156" that finds consistency with these trends (for 1950-1997) with the anthropogenic forcing. Rogers, 2012, Climate Dynamics, Published online 12 July 2012, doi: 10.1007/s00382-012-1437-6 finds connections to teleconnections with 20th century periodic warmer and cooler regimes in North American regions. (M Rummukainen, SMHI) | We have made this comment more specific and indicate that it refers to cooling in the continental US southeast and central) in spring and summer from 1979-2005, when a cooling is discerned. |
| 196 | 36567 | 21 | 24 | 32 | 24 | 32 | This would seem to touch on being policy-prescriptive. (M Rummukainen, SMHI) | Sentence has been modified |
| 197 | 35071 | 21 | 24 | 42 | 0 | 0 | "It is expected that..." I find this sentence ambiguous. In addition, instead of "expected" I suggest "hoped" or "generally believed". (Ramon de Elia, Ouranos consortium) | Sentence simplified and modified |
| 198 | 51183 | 21 | 24 | 46 | 24 | 46 | "likely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | The generic use of likely is difficult to avoid here - we could replace it with 'probable' but this would not be better from the guidelines point of view, would it? Happy to entertain your suggestion on this. |
| 199 | 38367 | 21 | 25 | 1 | 0 | 0 | Is this the 'standard' IPCC glossary definition? (Claire Goodess, University of East Anglia) | Yes, the standard WG1 definition |
| 200 | 38368 | 21 | 25 | 3 | 0 | 0 | Natural variability is also explored by running very long control simulations. (Claire Goodess, University of East Anglia) | True, but multiple realizations is the more common approach |
| 201 | 42723 | 21 | 25 | 13 | 0 | 0 | Although an Australian Aid activity, rather than a regional cross government acitvity, the Pacifc Climate Chnage Research Program is a potentially relevant example here. This provided projection information tailored for decision-making for multiple pacifc Island states. See: http://www.cawcr.gov.au/projects/PCCSP/ and the pulicattions listed there (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | This material is just being provided as an example. The intention was not to address relevant regional studies which is the remit of the regional chapters. |
| 202 | 42159 | 21 | 25 | 48 | 25 | 50 | Analysis of annual precipitation at Mauritius over the period 1904 to 2010 shows a decreasing trend in rainfall. In fact mean annual rainfall has decreased by about 5% since the beginning of the last century. Trend analysis of annual rainfall at the other Indian Ocean Islands such as Rodrigues, St Brandon and Agalega shows increased annual variability; decadal analysis does indicate a slight decreasing trend as well. (Premchand Goolaup, Mauritius Meteorological Services) | Text added to this effect. |
| 203 | 39987 | 21 | 26 | 7 | 26 | 7 | sense? Do you mean everything between the 10th and the 90th percentile, or only those two values? (Peter Burt, University of Greenwich) | The former. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| **204** | 45113 | 21 | 26 | 24 | 0 | 37 | Note also the Pacific Climate Change Science Program's analyses for Pacific SIDS - a 530-page 2-Volume technical report titled "Climate change in the Pacific: scientific assessment and new research", Vol 1 is an overview of past and future climate change in the western tropical Pacific, and Vol 2 is 15 country-specific chapters on past and future climate change, coupled with 15 country-specific brochures - see http://www.cawcr.gov.au/projects/PCCSP/ (Mark Stafford-Smith, Commonwealth Scientific and Industrial Research Organisation) | This material is just being provided as an example. The intention was not to address relevant regional studies which is the remit of the regional chapters. |
| **205** | 53440 | 21 | 26 | 25 | 26 | 25 | Predicted and projected are different. (Kristie L. Ebi, IPCC WGII TSU) | Yes, predicted implies we have confidence, projected that the change is plausible. |
| **206** | 36568 | 21 | 26 | 30 | 26 | 31 | Globally or for Africa(n regions)? (M Rummukainen, SMHI) | For African regions - the focus of the box. |
| **207** | 35604 | 21 | 26 | 34 | 26 | 35 | In most cases, seasonal precipitation changes have a lower signal-to-noise ratio (because of larger noise) than annual changes. So if scenarios of annual precipitation are informed by past variability, the same also holds at least to the same extent to seasonal precipitation. (Jouni Räisänen, University of Helsinki) | This may be the case but would need to be studied specifically. The statement was meant to warn about simply applying annual results to all seasons. |
| **208** | 53441 | 21 | 26 | 42 | 26 | 46 | The title says this section is about climate change, but line 46 says it also includes an assessment of non-climate drivers, suggesting a title change could be helpful. (Kristie L. Ebi, IPCC WGII TSU) | The title is now appropriate in the new chapter structure, as the section only includes physical climate considerations |
| **209** | 44584 | 21 | 27 | 3 | 27 | 7 | '... they were still not comprehensive enough..', please give more then a unproven statement (Frank Kreienkamp, Climate & Environment Consulting Potsdam GmbH) | This sentence was removed |
| **210** | 53442 | 21 | 27 | 5 | 27 | 14 | Much of this is repeated elsewhere. (Kristie L. Ebi, IPCC WGII TSU) | Much of this text was removed |
| **211** | 36569 | 21 | 27 | 9 | 27 | 11 | If the emphasis here is on results of CORDEX, later references should be explored, as the Giorgi et al. provides the idea of the project. If earlier work is referred to, suggest providing references to relevant specific articles or reviews. (M Rummukainen, SMHI) | Later CORDEX references have become available and are being quoted later in the section. This specific sentence was removed. |
| **212** | 38369 | 21 | 27 | 19 | 0 | 0 | In this section, the AR4 likelihood statements are not directly comparable with those from AR5 which use the new uncertainty guidance. Does this need to be explicitly stated in this chapter or is it discussed elsewhere? (Claire Goodess, University of East Anglia) | We have tried to follow more closely the guidance on likelihood statements in the revised version. |
| **213** | 51184 | 21 | 27 | 19 | 0 | 0 | Section 21.4.1.1.1. For this section, the author team might consider additionally presenting a short summary as relevant to the special report on extremes. Also, all calibrated uncertainty language--especially the likelihood terms on lines 25-43 of this page--should be italicized. (Katharine Mach, IPCC WGII TSU) | The short summary statements coming from the AR4 have been removed from this section because of space issues. |
| **214** | 36570 | 21 | 28 | 3 | 28 | 17 | Another relevant reference would be "Hawkins and Sutton, 2012. Geophysical Research Letters, 39:L01702, doi:10.1029/2011GL050087". (M Rummukainen, SMHI) | This from the section, as the hotspot discussion is now presented in a separate section. The discussion of emergent hotspots, for which the Hawkins-Sutton reference would be relevant was also removed. |
| **215** | 35605 | 21 | 28 | 19 | 28 | 25 | Temperature and (particularly) precipitation changes vary within the subcontinental regions. As a result, the PDFs for the local changes (which are more relevant for most users) will be different, and generally wider, than those for the subcontinental mean values shown in Fig. 21-7. (Jouni Räisänen, University of Helsinki) | Comment well taken. This figure was mostly inserted for illustrative purposes. However a brief comment along the line sindicated by the reviewer was added. |
| **216** | 42724 | 21 | 28 | 19 | 28 | 27 | I think the work of Watterson which constructed pdfs on a global grid using pattern scaling and including a natural vaiability component is worth citing here. One of these references is in the reference list anyway but not cited. The papers are: Watterson, I. 2008: Calculation of probability density functions for temperature and precipitation change under global warming. Journal of Geophysical Research-Atmospheres, 113, D12106,doi:12110.11029/12007JD009254. Watterson, I.G. and P. H. Whetton (2011) Distributions of decadal means of temperature and precipitation change under global warming. JGR, 116, D07101, doi:10.1029/2010JD014502 Watterson I. G. and Whetton, P. H. Joint PDFs for Australian climate in future decades and an idealised application to wheat crop yield. AMOJ, 61, 221-230, 2011 Watterson, I. G., Calculation of joint PDFs for climate change with properties matching Australian projections. AMOJ, 61, 211-219, 2011 (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | Thanks, we added these references. |
| **217** | 36571 | 21 | 28 | 36 | 28 | 41 | Reference(s) needed. (M Rummukainen, SMHI) | This information comes directly from WGI chapter 12, which is referenced. |
| **218** | 42725 | 21 | 28 | 36 | 28 | 41 | Irving et al (submitted) is an Australian example of this comparison with this conclusion. I will ask the author to send the manuscript to the LAs (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | We still have not received this paper. Maybe it can be added at later drafting stages. |
| **219** | 36572 | 21 | 28 | 43 | 28 | 43 | Suggest "has an additional" rather than "places greater emphasis" for additional clarity. The near-term runs complement the century-long ones, rather than take the lead. Refer to WGI. (M Rummukainen, SMHI) | Changed, thanks. |
| **220** | 39988 | 21 | 28 | 50 | 28 | 50 | space required between numbers and units (Peter Burt, University of Greenwich) | Changed, thanks. |
| **221** | 53443 | 21 | 28 | 50 | 28 | 50 | The previous line used degrees C, this uses degrees K. Please define or make consistent. (Kristie L. Ebi, IPCC WGII TSU) | We now try to use consistentyl degrees C, thanks. |
| **222** | 53444 | 21 | 29 | 4 | 29 | 12 | I am not sure what this means. (Kristie L. Ebi, IPCC WGII TSU) | This paragraph has been re-written for greater clarity. |
| **223** | 48563 | 21 | 29 | 19 | 0 | 0 | My glancing impression is that the southern Africa hotspot arises because of the strong fractional trend in winter rainfall, i.e. because the denominator is nearly zero. (Dáithí Stone, University of Cape Town) | This is difficult to say, given that the hot-spot metric involves multiple parameters. |
| **224** | 53445 | 21 | 29 | 27 | 29 | 28 | Perhaps include a description of this method in supplemental materials? (Kristie L. Ebi, IPCC WGII TSU) | The method is extensively describedd in the paper cited, so it is probably not necessary to add a descritpion here. |
| **225** | 39989 | 21 | 29 | 33 | 29 | 33 | change 'hydrologic' to 'hydrological' (Peter Burt, University of Greenwich) | We have used the term hydrologic in the past, and it seems to be appropriate. |
| **226** | 36573 | 21 | 29 | 33 | 29 | 53 | Should refer to SREX. (M Rummukainen, SMHI) | We added this reference, thanks. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 227 | 36574 | 21 | 29 | 41 | 29 | 42 | Need a reference. (M Rummukainen, SMHI) | References added, thanks. |
| 228 | 38370 | 21 | 29 | 42 | 0 | 0 | Could refer to SREX here. (Claire Goodess, University of East Anglia) | Done, thanks. |
| 229 | 38371 | 21 | 29 | 51 | 29 | 53 | This seems a somewhat more confident statement about monsoons than in SREX. (Claire Goodess, University of East Anglia) | This conclusion was taken from WGI Chapter 14, which seems indeed stronger than in earlier assessments. |
| 230 | 41520 | 21 | 30 | 1 | 35 | 26 | In this region by region discussion of "Major Modes of Variability" I suggest replacement of discussion of "Australia (P35) with the broader "Australasia" region. Also perhaps you could add something on some of the ocean regions which include the vulnerable small-island states ? (David Wratt, NIWA, New Zealand) | The region-by-region discussion was removed for space reasons, since it is already present in WGI Chapteer 14 and in the WGII regional chapters. |
| 231 | 36575 | 21 | 30 | 2 | 0 | 0 | A lot of the specific regional sections provided under this heading are not about major modes of variability, but regional projections as such. Subsection-numbering on the same level of the regions should be considered. (M Rummukainen, SMHI) | Sorry about this mistake. Anyways, the regional sections have been removed (see above). |
| 232 | 51185 | 21 | 30 | 2 | 0 | 0 | Section 21.4.1.1.3. For each subsection of 21.4.1.1.3, the author team should consider briefly cross-referencing findings from the special report on extremes and the working group 1 contribution to the 5th assessment report, as appropriate. (Katharine Mach, IPCC WGII TSU) | Thanks, we have tried to enhance referencing to the SREX report. |
| 233 | 53446 | 21 | 30 | 2 | 35 | 33 | Please ensure consistency with WGI. (Kristie L. Ebi, IPCC WGII TSU) | We have tried to make sure to be consistent with incremental WGI drafts. |
| 234 | 38372 | 21 | 30 | 3 | 0 | 0 | For each region, could also refer to SREX Table 3.3 for projections (and 3.2 on observations) (Claire Goodess, University of East Anglia) | As mentioned above, the regional subsections have been removed. |
| 235 | 39990 | 21 | 30 | 5 | 30 | 5 | second 'n' of Nino needs to be enye (Peter Burt, University of Greenwich) | Modified, thanks. |
| 236 | 36576 | 21 | 30 | 12 | 30 | 13 | This may not be a topic for "assessment" as such, if the work does not go well beyond the WG I work. Perhaps "Reviewed in the context of the regional chapters..."? Or the "WGI assessment revisited", if more recent literature is abundant. (M Rummukainen, SMHI) | This sentence was changed and the paragraph reduced to just summarize results from the WGI assessment. |
| 237 | 36577 | 21 | 30 | 18 | 30 | 20 | Use of "recent research" would seem to need more recent references than 2005. (M Rummukainen, SMHI) | We added referenc eto WGI Chapter 14. |
| 238 | 48565 | 21 | 30 | 23 | 30 | 24 | Than what? (Dáithí Stone, University of Cape Town) | Sentence clarified. |
| 239 | 35606 | 21 | 30 | 26 | 30 | 26 | A new subsection should be started from here. This is not about major modes of variability. (Jouni Räisänen, University of Helsinki) | Regional sub-sections have been removed. |
| 240 | 48567 | 21 | 30 | 27 | 35 | 26 | All of this is under the section heading of “Major Modes of Variability” but it doesn't seem to contain anything about major modes of variability but rather just projections of future temperature and precipitation trends. (Dáithí Stone, University of Cape Town) | Regional sub-section have been removed. |
| 241 | 46126 | 21 | 30 | 27 | 35 | 33 | Is this repetition of what is in Chapters 22 to 30? (Luis E. Garcia, World Bank) | Not really. This text was written with no specific reference to text in regional chapters. |
| 242 | 36578 | 21 | 30 | 29 | 30 | 37 | "Oscillation" (as in ECO) would seem to risk confusing patterns of change to patterns of (unforced) variability. Please consider whether this adds useful information in this text. (M Rummukainen, SMHI) | The term ECO was used in the paper cited and indeed this pattern summarizes well the behavior of the change signal over Europe. |
| 243 | 38373 | 21 | 30 | 30 | 30 | 33 | Make it clear that these are RCM intercomparisons. Whereas Figure 21-9 is based on GCMs. (Claire Goodess, University of East Anglia) | Clarified, thanks. |
| 244 | 35607 | 21 | 30 | 51 | 30 | 52 | This holds for southern and central Europe in summer, but not for northern Europe in winter (cf. Lines 39-40) (Jouni Räisänen, University of Helsinki) | This was clarified, thanks. |
| 245 | 36579 | 21 | 31 | 8 | 31 | 8 | The review of Ulbrich et al. in Theor Appl Clim, 96:1-2 (2009), 117-131, DOI: 10.1007/s00704-008-0083-8 could be considered as reference here. (M Rummukainen, SMHI) | reference added. |
| 246 | 38374 | 21 | 31 | 19 | 0 | 0 | For consistency with other sections, could add a couple of sentences about European statistical downscaling activitites. (Claire Goodess, University of East Anglia) | This will be done in the next round of the drafting process, as relevent references will be assessed. |
| 247 | 36580 | 21 | 31 | 24 | 31 | 24 | "robust conclusions were quite different in the AR4" is rather unclear. Different from what? (M Rummukainen, SMHI) | The word was "difficult", not "different". Anyways, the sentencee was actually removed. |
| 248 | 35608 | 21 | 31 | 26 | 31 | 37 | In most of the simulations shown in Fig. 21-10, the changes are statistically insignificant in most parts of the area. This suggests that a substantial fraction of the apparent differences between the models (and of the uncertainty in the real world in the next 50 years) may be due to unforced natural variability, rather than directly associated with model differences. (Jouni Räisänen, University of Helsinki) | This is certainly true, and is now noted in the text. However, the broad change patterns do seem to vary strongly across models even if they are driven by the same GCMs. |
| 249 | 36581 | 21 | 31 | 40 | 31 | 40 | Should probably explicitly mention what the "linear changes" means. Also, the caption refers to the text, but there does not seem to be further discussion on the land cover change experiments. (M Rummukainen, SMHI) | Done, thanks, although we refer to the original paper for the discussion of the land cover experiment. |
| 250 | 36582 | 21 | 32 | 1 | 32 | 2 | Add a placeholder for references? (M Rummukainen, SMHI) | Comment noted, thanks. |
| 251 | 38375 | 21 | 32 | 5 | 32 | 10 | I don't fully understand this paragraph. Web portals don't just provide access to pattern-scaling techniques. Maybe including some examples would help. (Claire Goodess, University of East Anglia) | The sentence on web portals has been removed. |
| 252 | 39991 | 21 | 32 | 16 | 32 | 16 | I presume these are months, please give details in full (Peter Burt, University of Greenwich) | This sentence has been removed in the section's restructuring. |
| 253 | 36583 | 21 | 32 | 49 | 32 | 50 | Please cross-check with AR5/WGI text. Indicatively, results would seem to suggest that this is rather clear for the Southern Hemisphere, but much less so for the Northern Hemisphere. (M Rummukainen, SMHI) | This sentence has been removed in the section's restructuring. |
| 254 | 51186 | 21 | 33 | 4 | 33 | 4 | "likely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | No, the term likely here was used in a qualitative sense and it has been removed. |
| 255 | 36584 | 21 | 33 | 15 | 33 | 22 | Refer to AR5/WGI/Chapter 9.6. (M Rummukainen, SMHI) | This sentence was removed in the section's restructuring |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 256 | 35072 | 21 | 33 | 17 | 0 | 0 | Regarding added value, section 9.6.3.2 of WG1 discusses the topic. A study of potential added value on the climate change signal in NARCCAP models is discussed in Di Luca, de Elia, Laprise, 2012: Potential for small scale added value of RCM's downscaled climate change signal, climate dynamics, in press. (Ramon de Elia, Ouranos consortium) | This sentence was removed in the section's restructuring |
| 257 | 35609 | 21 | 33 | 19 | 33 | 22 | Liang et al. (2008) show that the RCM-GCM differences in temperature and precipitation are similar between the present and the future climate, indicating that, to a first order, the biases tend to be preserved. However, the simulated changes (future minus present) were not found to be strongly correlated with the present climate biases (paragraph 12 of their paper). (Jouni Räisänen, University of Helsinki) | This sentence was removed in the section's restructuring |
| 258 | 38376 | 21 | 33 | 24 | 33 | 47 | There is quite a lot of detail on NARCCAP compared with similar inititatives in other regions. (Claire Goodess, University of East Anglia) | The discussion on NARCCAAP results was somewhat shortenend in the section's restructuring. |
| 259 | 35073 | 21 | 33 | 33 | 0 | 0 | Another study of robustness in the downscaled cliamte and climate change signal is de Elia and Cote 2010 (2010) Climate and climate change sensitivity to model configuration in the Canadian RCM over North America. Meteorologische Zeitschrift 19:325-339. doi:10.1127/0941-2948/2010/0469. (Ramon de Elia, Ouranos consortium) | Reference added, thanks. |
| 260 | 35074 | 21 | 34 | 3 | 0 | 0 | The named researchers are not preparing this work for submission. From our institute, a study on the interannual variability of NARCCAP simulations has been submitted in early june to Climate Dynamics. de Elia, Biner, Frigon: Climate variability and expected regional climate change over North America. (Ramon de Elia, Ouranos consortium) | Reference added, thanks. |
| 261 | 35075 | 21 | 34 | 8 | 0 | 0 | Perhaps it could be said that "none have provided across-the-board evidence of RCM simulations superiority regarding future climate". In addition, it is important to say that global models, although with lower resolution, have the advantage of the large number of simulations that favor estimations of uncertainty. This segment could be linked with the paragraph of page 33 and line 15. (Ramon de Elia, Ouranos consortium) | This staememnt has been removed (see next comments) |
| 262 | 36585 | 21 | 34 | 8 | 34 | 11 | "Across-the-board superiority" is difficult to disentangle. RCMs have skill and are demonstrated to add value to aspects of regional climate, in various regions. The statement here would also seem to be a bit at odds with page 35, lines 1-4 and 16-17. Also, RCMs are conditional to, e.g., the quality of the GCM-provided boundary conditions. (M Rummukainen, SMHI) | Comment well taken. This statement has been removed. |
| 263 | 35610 | 21 | 34 | 10 | 34 | 11 | This issue is discussed in a wider context in AR5 WG1 Chapter 12.5.3.1. A reference to it might be useful. (Jouni Räisänen, University of Helsinki) | This statement has been removed (see previous comment) |
| 264 | 38377 | 21 | 34 | 23 | 34 | 37 | This paragraph deals with observations - which are not discussed for other regions. Should be consistent. (Claire Goodess, University of East Anglia) | This paragraph has been removed. |
| 265 | 39992 | 21 | 34 | 23 | 34 | 37 | space required between numbers and units (Peter Burt, University of Greenwich) | Corrections made |
| 266 | 48566 | 21 | 34 | 23 | 34 | 37 | This entire paragraph deals with recent observed changes, a topic which was missing in the preceding continents. (Dáithí Stone, University of Cape Town) | This paragraph has been removed. |
| 267 | 36586 | 21 | 34 | 24 | 34 | 21 | References are missing. (M Rummukainen, SMHI) | This paragraph has been removed. |
| 268 | 35890 | 21 | 34 | 40 | 34 | 41 | The references for the projected climatic changes in South and East Asia, e.g., AR4 and Giorgi and Bi (2005), appear somewhat outdated. As for South Asia, it might be worthwhile to consider the recent review by Turner and Annamalai (2012) and the references therein: A.G. Turner and H. Annamalai, 2012: Climate change and the South Asian summer monsoon. Nature Climate Change, doi: 10.1038/nclimate1495. (Wilhelm May, Danish Meteorological Institute) | This sentence has been removed, since the section now deals only with downsclaing results. |
| 269 | 36587 | 21 | 34 | 40 | 34 | 41 | Later references? (M Rummukainen, SMHI) | See response above |
| 270 | 35889 | 21 | 34 | 41 | 34 | 42 | "Numerous high-resolution… not in line with those from GCMs." - This is a very important point seen from the impact point of view, which might need some more clarification. Is there, for example, a good reason for trusting more in the high-resolution RCM simulations than in the GCM simulations? (Wilhelm May, Danish Meteorological Institute) | It is really difficult to establish whether the RCM projections are more credible. This would require large ensembles of runs, possibly available as part of the CORDEX initiative. A statement in this regard has been added. |
| 271 | 39993 | 21 | 35 | 1 | 35 | 1 | change 'experiment' to 'experiments' (Peter Burt, University of Greenwich) | Changed, thanks. |
| 272 | 43122 | 21 | 35 | 9 | 35 | 26 | Astonishingly, this text, apart from the first three lines, manages to say absolutely nothing about how the future climate may be expected to change over Australiasia. It is all about process and method, which I have always assumed is the role of WGI, nothing about the results. Suggest lines 11 to 26 are deleted. (Jean Palutikof, Griffith University) | This, along woth other "regional" sections were removed in the chapter's restructuring. Only some comments on downscaling results were kept in line with what done for the other regions. |
| 273 | 42726 | 21 | 35 | 9 | 35 | 36 | Similar to what I commented in the ZOD, this is poor coverage of recent Australasian developments and quite idiosyncratic and unrepresetantive in what is cites. I will send the authors a number of key papers and if, they wish, woudl be happy to draft some words. The climate section of chapter 25 cites many of these, but there are more which have become available in the last few months. (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | As mentioned previously, the regional sections were removed from this chapter, since relevant material will be included in the Regional Chapters or the WGI Chapter 14. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 274 | 42727 | 21 | 35 | 28 | 0 | 0 | I am not sure how it would fit into the (continental) regional format in this section, but here are a number of paperswhich greatly expand what we know since the AR4 about climate change and Pacific island countries. Here are some (and I will ask the authors to send some pre-publciation manuscripts through) : Brown, J. R., S. B. Power, F. P. Delage, R. A. Colman, A. F. Moise and B. F. Murphy (2011), Evaluation of the South Pacific Convergence Zone in IPCC AR4 climate model simulations of the 20th century, Journal of Climate, Volume 24 (6), 1565-1582. Irving D, Perkins S, Brown JR, Sen Gupta A, Moise A, Murphy B, Muir L, Colman R, Power S, Delage F, & Brown JN (2011). Evaluating global climate models for the Pacific Island region. Climate Research, Volume 49, Issue 3, pages 169-187. doi:10.3354/cr01. Brown, J., Moise, A., Delage, F. (2) Changes in the South Pacific Convergence Zone in IPCC AR4 future climate projections. Submitted to Climate Dynamics, February 2011. Nguyen, K. Katzfey, J., McGregor, J. 2011. Global 60 km simulations with CCAM: Evaluation over the tropics. Climate Dynamics. Accepted 10.09.11 Perkins, S. 2011. Biases and model agreement in projections of climate extremes over the tropical Pacific. Accepted by Earth Interactions. Perkins, S., Irving, D.B.,Brown, J.R., Power, S.B., Murphy, B.F., Moise, A.F., Colman, R.A., Delage, F.P. 2011. CMIP3 ensemble climate projections over the western tropical Pacific based on model skill. Accepted by Climate Research.- (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | Similarly to the previous comment, most of the papers cited by the reviewer are based on analysis of CMIP3 models, and this analysis has been removed from this section and left to the regional chapter or the WGI Chapter 14. |
| 275 | 36588 | 21 | 35 | 31 | 35 | 33 | Maybe should include gravity-related changes (due to redistribution of water). (M Rummukainen, SMHI) | Changed, thanks. |
| 276 | 41521 | 21 | 35 | 31 | 35 | 33 | I suggest you provide a cross-reference here to the relevant parts of the WG1 AR5 assessment. (David Wratt, NIWA, New Zealand) | Done, thanks. |
| 277 | 35441 | 21 | 35 | 32 | 0 | 0 | Much/most of loss from Greenland and Antarctica is not through melting, but iceberg calving. (David Vaughan, British Antarctic Survey) | Changed, thanks. |
| 278 | 35442 | 21 | 35 | 33 | 0 | 0 | The dominant causes of regionality in sea level change, is probably changes in the geoid, and crustal subsidence and rebound. (David Vaughan, British Antarctic Survey) | Changed, thanks. |
| 279 | 51187 | 21 | 35 | 36 | 0 | 0 | Section 21.4.1.2.1. For this section, the author team might consider additionally referencing findings on extreme sea levels and coastal high waters from the special report on extremes. Also, all calibrated uncertainty language used in the previous reports--especially the likelihood terms on lines 50 and 52--should be italicized. (Katharine Mach, IPCC WGII TSU) | This will be added at the next draft stage. |
| 280 | 39994 | 21 | 36 | 4 | 36 | 4 | Celsius? (Peter Burt, University of Greenwich) | Corrected, thanks. |
| 281 | 53447 | 21 | 36 | 4 | 36 | 16 | Please ensure consistency with chapter 30. (Kristie L. Ebi, IPCC WGII TSU) | This will be checked at the next draft stage. |
| 282 | 35443 | 21 | 36 | 13 | 0 | 0 | Somewhere there should call-outs to WG-Ch4 for current contributions of glaciers and ice sheets to SLR, and CH13 for projections in those contributions (David Vaughan, British Antarctic Survey) | These have been added. |
| 283 | 35444 | 21 | 36 | 18 | 36 | 23 | Paragraph seems out of place here (David Vaughan, British Antarctic Survey) | As ocean acidification is an important issue, we would like to keep this paragraph. |
| 284 | 43705 | 21 | 36 | 25 | 36 | 41 | This way of citing the WG1-AR5 chapter on SLR focuses entirely on the climate model projections whereas that chapter is actually taking the more careful line to note that the semi-empirical approaches all give higher estimates. Furthermore several review papers have shown that the paleoclimatic evidence from 125,000 years ago appears to be more consistent with the semi-empirical estimates than those coming from climate models so far. So in the context of potential impacts, the WG2 report should not be ignoring papers like [Rohling, E.J., Grant, K., Hemleben, C., Siddall, M., Hoogakker, B.A.A., Bolshaw, M., and Kucera, M., 2008: High rates of sea-level rise during the last interglacial period Nature Geoscience, 1, 38-42] which show there is strong evidence that we may need to adapt to 1.6 m per century in the not so distant future. More generally there are several other reasons for not basing adaptation on climate model results. E.g. [Min, S.-K., Zhang, X., Zwiers, F.W., and Hegerl, G.C., 2011: Human contribution to more-intense precipitation extremes. Nature, 470, 378-381] shows that the last 50 years has seen a larger trend in extreme events than can be explained by models so far. Then there is the long standing concern that models do not seem to be able to reproduce some basic aspects of climate in the Eocene - e.g. [Valdes, P., 2011: Built for stability. Nature Geoscience, 4, 414-416.] (Martin Manning, Victoria University of Wellington) | In this paragraph we do refer to the higher estimates of sea level rise from semi-empirical approaches. Given how delicate this issue is and that we are only providing a very brief summary we prefer not to enter into the detail of empirical vs. model-based estimates. |
| 285 | 51188 | 21 | 36 | 26 | 37 | 5 | Likelihood terms cited from other reports should be italicized. In this series of paragraphs, it seems that the following terms should be italicized accordingly: "very likely" on line 26, page 36, and on line 3, page 37; "likely" on line 27, 28, 38, and 53, page 36; and "very unlikely" on line 5, page 37. Additionally, in all of these cases, the author team should ensure that the usage is in fact per the uncertainties guidance for authors (avoiding casual usage of these reserved likelihood terms). (Katharine Mach, IPCC WGII TSU) | We will double check this, thanks. |
| 286 | 35445 | 21 | 36 | 37 | 0 | 0 | This sentence makes it sound like GMSL rise is unimportant, which is not true. It is true that some areas will not see sea-level rise, but others will see double the GMSL rate, and they will suffer accordingly. The most protected areas are those (e.g., Scandinavian) coasts where rebound is so rapid that GMSL is unlikely to cause local rise, but nearby in the North Sea the very high sensitivity of storm surge statistics to GMSL means that even mid-range projected SLR will mean significant changes to the frequency and severity of innundation. (David Vaughan, British Antarctic Survey) | The sentence in the text is rather general in the sense of simply indicating that regional sea level rise is not necessarily the same as the global one. We would rather not enter a discussion of the possible implications of even modest levels of sea level rise. |
| 287 | 51189 | 21 | 36 | 43 | 36 | 54 | For this paragraph, the author team should consider and cross-reference, as appropriate, chapter 3 of the special report on extremes. (Katharine Mach, IPCC WGII TSU) | This paragraph was cross checked with WGI, Chapter 13. At next draft stages we will also cross check with the appropriate SRES chapter. |
| 288 | 48568 | 21 | 36 | 45 | 36 | 46 | Half of the surface oceanic component of ENSO is a Kelvin gravity wave, so of course. Do you mean something else? (Dáithí Stone, University of Cape Town) | Again, this is simply a general summary statement in line with the findings of the WGI report. |
| 289 | 35446 | 21 | 36 | 47 | 0 | 0 | The meditterranean is almost isolated from GMSL, and so has its own sea-level trends, but I think regional subsidence is the most significant issue for Venice. (David Vaughan, British Antarctic Survey) | This is correct, we have added it. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 290 | 35611 | 21 | 36 | 53 | 36 | 54 | Be precise with the terminology. Storm surge is generally defined as the local increase in sea level due to wind and pressure decrease (e.g., AMS glossary of meteorology). The increase in mean sea level is additive to this, meaning that extreme sea level heights (relative to present-day normal) may increase even where storm surges do not. (Jouni Räisänen, University of Helsinki) | it does not appear to the authors that the statement in the text is in contradiction with what the reviewer is saying, since increase in mean sea level will affect both storm surges and extreme sea level episodes. We have nevertheless modified the sentence to clarify this point. |
| 291 | 35612 | 21 | 37 | 2 | 37 | 3 | Should be: "do not change" (Jouni Räisänen, University of Helsinki) | Thanks for spotting this important typo. The sentence has been changed. |
| 292 | 53448 | 21 | 37 | 11 | 37 | 14 | Chapter 1 includes an assessment of air quality issues of relevance for WGII. Please ensure consistency. (Kristie L. Ebi, IPCC WGII TSU) | We will check this at the next level of drafting process. |
| 293 | 36589 | 21 | 37 | 28 | 37 | 39 | The UNEP assessment of short-lived climate forcers, even though greyish literature, could perhaps be considered as references. (M Rummukainen, SMHI) | We will consider this at the next drafting process. |
| 294 | 53449 | 21 | 37 | 28 | 37 | 39 | Please ensure consistency with chapter 1. (Kristie L. Ebi, IPCC WGII TSU) | See above. |
| 295 | 36590 | 21 | 37 | 48 | 37 | 51 | Please provide the periods (present, future). (M Rummukainen, SMHI) | Done, thanks. |
| 296 | 36591 | 21 | 38 | 2 | 38 | 3 | Please provide the periods (present, future). (M Rummukainen, SMHI) | Done., thanks. |
| 297 | 51190 | 21 | 38 | 8 | 38 | 8 | "likely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | Done, thanks |
| 298 | 51191 | 21 | 38 | 19 | 0 | 0 | Section 21.4.1.4.1. For this section, the author team might consider additional brief cross-reference of the special report on extremes. Also, calibrated uncertainty language from previous reports--especially the likelihood term on line 23--should be italicized. (Katharine Mach, IPCC WGII TSU) | Done, thanks. |
| 299 | 35613 | 21 | 38 | 33 | 38 | 35 | The comple meltdown is conditional on the warming being large enough (threshold according to the numbers in AR4 WG1 section 10.7.4.3 numbers: 3.2-6.2C in local annual mean warming in Greenland relative to pre-industrial (Jouni Räisänen, University of Helsinki) | This sub-sections has been removed. |
| 300 | 36592 | 21 | 38 | 40 | 0 | 0 | References needed. (M Rummukainen, SMHI) | This sentence was removed. |
| 301 | 35614 | 21 | 38 | 44 | 38 | 45 | Please mention the period that these trends were calculated for. (Jouni Räisänen, University of Helsinki) | Done, thanks. |
| 302 | 36593 | 21 | 38 | 50 | 38 | 51 | Please specify "currently". (M Rummukainen, SMHI) | This sentence was removed. |
| 303 | 35447 | 21 | 39 | 1 | 39 | 4 | Please check for new assessemtns in WGI Ch4 Second order draft (David Vaughan, British Antarctic Survey) | The values cited have been checkedd with the WGI Chappter 4 SOD. |
| 304 | 39995 | 21 | 39 | 6 | 39 | 13 | supporting references required (Peter Burt, University of Greenwich) | We use here as basic reference WGI Chapter 4. |
| 305 | 36594 | 21 | 39 | 8 | 39 | 8 | Perhaps, "where spring snow cover is sensitive to temperature increase" rather than "regions sensitive to spring snow cover"? (M Rummukainen, SMHI) | This sentence has been modified. |
| 306 | 39996 | 21 | 39 | 8 | 39 | 8 | change 'regios' to 'regions' (Peter Burt, University of Greenwich) | Done, thanks. |
| 307 | 48570 | 21 | 39 | 15 | 0 | 0 | I'm sure I've seen then based on other sources too. (Dáithí Stone, University of Cape Town) | Thanks for catching this. The sentence was modified. |
| 308 | 53450 | 21 | 39 | 28 | 41 | 35 | Please ensure consistency with WGIII. (Kristie L. Ebi, IPCC WGII TSU) | We think so but will verify with future drafts |
| 309 | 48569 | 21 | 39 | 44 | 39 | 45 | “Arctic ice” is primarily sea ice, which is not ice sheet. (Dáithí Stone, University of Cape Town) | No reference to 'Arctic Ice' on these lines |
| 310 | 39997 | 21 | 40 | 18 | 40 | 18 | bad English. Don’t start sentence with 'But' (Peter Burt, University of Greenwich) | Not mine LOM |
| 311 | 36595 | 21 | 40 | 27 | 40 | 27 | Any literature on the SSPs? (M Rummukainen, SMHI) | This section has been eliminated |
| 312 | 39998 | 21 | 40 | 30 | 40 | 30 | change 2nd 'are' to 'is' (Peter Burt, University of Greenwich) | Section eliminated |
| 313 | 38378 | 21 | 40 | 48 | 0 | 0 | It would more accurately reflect the content to say 'Regional Climate Change'. Though the quesiton of robust impacts information is also important. (Claire Goodess, University of East Anglia) | Title is no longer used. |
| 314 | 51192 | 21 | 41 | 6 | 41 | 6 | "likely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | Text changed. |
| 315 | 36596 | 21 | 41 | 8 | 41 | 10 | Hegerl and Zwiers, 2011, in Wiley Interdisciplinary Reviews: Climate Change, 2:4, 570–591, discuss the use of models in D&A of climate change, and may provide a reference here. (M Rummukainen, SMHI) | Added |
| 316 | 53451 | 21 | 41 | 8 | 41 | 25 | Many of these issues were raised earlier. (Kristie L. Ebi, IPCC WGII TSU) | Text now moved and better integrated. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 317 | 43706 | 21 | 41 | 10 | 0 | 0 | There is quite a bit of overlap in what is being covered in section 21.5.1 and then in parts of chapter 14. There are also some differences and I think that your summary of Hinkel's point about vulnerability indicators is a good one. Some clearer definition of slightly different scopes for these two similar parts of the WG2 report might be helpful. But the IPCC Guidelines are not meant to force a consensus or make the authors of one chapter agree with those of another chapter. (Martin Manning, Victoria University of Wellington) | We agree that there is some overlap with chapter 14 (and with some other chapters covering methods as well), but have tried to emphasise regional dimensions of approaches to IAV assessment. These include: contrasting the approaches reported in regional chapters, describing how the type of approach can influence the types of results presented, highlighting some of the uncertainties to look out for in these results, and reporting on new analyses and tools that are being adopted in regional studies. The original section 21.5.1 has been distributed among two sections in this draft: a description of IAV approaches adopted in regional studies is now in 21.3.1 and 21.3.2 (vulnerability is treated with impacts in 21.3.1) and a critical assessment of these approaches is covered in 21.5.1 and 21.5.2. Here vulnerability is treated with adaptation in 21.5.1. We cross reference other chapters, where this is regarded as helpful for the reader. |
| 318 | 42728 | 21 | 41 | 18 | 41 | 25 | Another example of disparate projections being analsyed in term of differing regional processes in the models is Watterson 2011, although observed trends were not used to prefer one over the other. Watterson, I. G. Understanding and partitioning future climates for Australian regions from CMIP3 using ocean warming indices. Climatic Change 111:903–922, 2012. (Penny Whetton, Commonwealth Scientific and Industrial Research Organization - Marine and Atmospheric Research) | Reference added. |
| 319 | 39999 | 21 | 41 | 31 | 41 | 31 | change 'hotspots' to 'hotspot' (Peter Burt, University of Greenwich) | This is a grammar issue, will be dealt with during rewrite |
| 320 | 53452 | 21 | 41 | 33 | 41 | 34 | Hopefully, the value is to more than compare but to identify opportunities for improving resilience. (Kristie L. Ebi, IPCC WGII TSU) | Good point. But often the reason to compare is because funds are limited and areas that are considered more vulnerable have to be prioritised. |
| 321 | 38379 | 21 | 41 | 52 | 41 | 54 | One constraint is availability of information/data at suitable (higher) spatial resolution. (Claire Goodess, University of East Anglia) | correct,lack of spatially referenced data means we cannot 'plot' all the information. |
| 322 | 53453 | 21 | 41 | 54 | 41 | 54 | Or, how they may change in the future. (Kristie L. Ebi, IPCC WGII TSU) | Yes, very tricky. Thank you. |
| 323 | 45114 | 21 | 42 | 0 | 44 | 54 | But note same critique by Hinkel 2011 as outlined on your p.42, ll.43-48 and p.43, ll.10-17 applies. (Mark Stafford-Smith, Commonwealth Scientific and Industrial Research Organisation) | Yes, correct. Hinkel's work will be referenced more. |
| 324 | 40000 | 21 | 42 | 14 | 42 | 15 | English needs editing for sense (Peter Burt, University of Greenwich) | Requires appears twice; will be removed. |
| 325 | 36597 | 21 | 42 | 14 | 42 | 41 | The discussion is supported overall by rather old references. Suggest updating as possible also with more recent developments. (M Rummukainen, SMHI) | The vulnerability indicators literature is a bit older - the important critiques from this time still stand. More recent literature will also be added. |
| 326 | 51193 | 21 | 42 | 31 | 42 | 32 | The phrase "high confidence," as calibrated uncertainty language, should be italicized. Additionally, the missing references should be supplied. (Katharine Mach, IPCC WGII TSU) | yes, references need to be supplied. |
| 327 | 53454 | 21 | 42 | 43 | 42 | 48 | Vulnerability to what? (Kristie L. Ebi, IPCC WGII TSU) | climate change - it will be adjusted |
| 328 | 51194 | 21 | 43 | 3 | 43 | 3 | "unlikely" -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | It is not being used this way - another term will be used. |
| 329 | 40001 | 21 | 43 | 5 | 43 | 5 | bad English. Don’t start sentence with 'But' (Peter Burt, University of Greenwich) | Agreed |
| 330 | 51195 | 21 | 43 | 27 | 0 | 0 | Section 21.5.1.2. The author team is encouraged in development of this table, which must be fully fleshed out by the 2nd-order draft. (Katharine Mach, IPCC WGII TSU) | This table will be something different. |
| 331 | 38380 | 21 | 43 | 36 | 0 | 0 | This section only discusses integrated assessment models. What about other methodological approaches? (Claire Goodess, University of East Anglia) | This section was not completed and will be changed |
| 332 | 53455 | 21 | 43 | 41 | 43 | 41 | How is the degree of policy relevance determined? (Kristie L. Ebi, IPCC WGII TSU) | Not sure what this refers to - this section has not mentioned policy relevance. |
| 333 | 53456 | 21 | 43 | 44 | 43 | 50 | There certainly are issues with IAMs, but this should provide a more balanced assessment of their strengths and weaknesses. (Kristie L. Ebi, IPCC WGII TSU) | I think this refers to another point in the document, but the issues will be addressed - the section was not completed |
| 334 | 51196 | 21 | 43 | 52 | 44 | 10 | The author team should provide citations is appropriate to support these points. (Katharine Mach, IPCC WGII TSU) | Yes |
| 335 | 38381 | 21 | 44 | 1 | 44 | 15 | The bullet point criticisms are so negative that the final conclusion that IAMs can provide insights seems somewhat contradictory/surprising. (Claire Goodess, University of East Anglia) | Again, this was not complete |
| 336 | 40002 | 21 | 44 | 2 | 44 | 2 | move 'carefully' to after 'constant' to remove split infinitive and improve clarity (Peter Burt, University of Greenwich) | grammar issue that will be dealt with |
| 337 | 36598 | 21 | 44 | 12 | 44 | 15 | One could develop the discussion on the usefulness and uses of these models, as much of the preceding paragraphs are rather negative, to substantiate the assessment of the possibility to provide insights with these models. (M Rummukainen, SMHI) | Yes, this section was not complete |
| 338 | 51197 | 21 | 44 | 20 | 0 | 0 | Section 21.5.2.2. The author team is encouraged in development of this table, which must be fully fleshed out by the 2nd-order draft. (Katharine Mach, IPCC WGII TSU) | Again, this table will now be something else |
| 339 | 53457 | 21 | 44 | 29 | 45 | 3 | Please ensure consistency with the adaptation chapters. (Kristie L. Ebi, IPCC WGII TSU) | Yes, this section has now been redone. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 340 | 43123 | 21 | 44 | 31 | 45 | 3 | This section seems to be mainly devoted to Indicators. These are important, but the extensive work on Indicators recently by the UK Adaptation Sub-Committee of the Climate Change Committee (see http://www.theccc.org.uk/reports/adaptation) doesn't seem to be refernced here. Suggest unless there is a fuller treatment on Methodological Issues, that this section is renamed. (Jean Palutikof, Griffith University) | This was only one of the topics intended to go here, since it relates to methodology. This resource will be looked at |
| 341 | 51198 | 21 | 44 | 36 | 44 | 36 | The intended cross-chapter reference should be supplied. (Katharine Mach, IPCC WGII TSU) | Yes. |
| 342 | 36599 | 21 | 44 | 42 | 44 | 54 | Predominantly less than recent references. New developments? (M Rummukainen, SMHI) | Since this refers to what was discussed previously also, I think the main points are still valid - but I will update wih more recent refs |
| 343 | 51199 | 21 | 45 | 6 | 0 | 0 | Section 21.5.3.2. The author team is encouraged in development of this table, which must be fully fleshed out by the 2nd-order draft. (Katharine Mach, IPCC WGII TSU) | This will also be changed, |
| 344 | 51200 | 21 | 45 | 15 | 45 | 35 | All placeholders should be replaced by fully developed text by the 2nd-order draft. (Katharine Mach, IPCC WGII TSU) | Yes. |
| 345 | 48571 | 21 | 45 | 20 | 45 | 22 | I don't know what I'm talking about here, but I'm wondering if this statement is entirely accurate. Because such a large fraction of Africa's population and GDP is engaged in agriculture, without a marked continental export (in fact I think a net continental import), it strikes me that there is larger adaptive potential for Africa to minimise its vulnerability with respect to food production that for other continents, which have already employed much of those adaptive measures as part of their economic development. Thus while I would say that Africa is highly vulnerable to climate change through agriculture, and on the multi-year time-scale the impacts are important, I would hesitate to say the impacts are obviously important on the multi-decadal time-scale. I am out of my depth in this, but I would guess a lot of readers would also be so and it may be helpful to discuss such things like time-scale dependence in the more complete SOD. (Dáithí Stone, University of Cape Town) | This section is going to be deleted |
| 346 | 36600 | 21 | 45 | 37 | 45 | 44 | Predominantly less than recent references. New developments? (M Rummukainen, SMHI) | The purpose of this section is to explain what hotspots are and how they have been interpreted, not necessarily to give all the latest results. |
| 347 | 53458 | 21 | 45 | 42 | 45 | 42 | de Wet is not in the reference list. I believe the publication you mean is by Kovats et al. (Kristie L. Ebi, IPCC WGII TSU) | Thanks |
| 348 | 43124 | 21 | 45 | 52 | 46 | 42 | Not sure of the worth of this box. Hotspots are interesting, but how are they related to the main text of the chapter? I couldn't find much. (Jean Palutikof, Griffith University) | The point of this box will be elaborated in the text better. |
| 349 | 36601 | 21 | 46 | 4 | 46 | 4 | Could one find another example than # of crimes committed, to be more closely linked to climate issues? (M Rummukainen, SMHI) | The point is to show that hotspots can be useful for some things, but less useful for representing qualitative information |
| 350 | 51201 | 21 | 46 | 18 | 46 | 20 | "likely" on lines 18 and 20 -- If this term is being used per the uncertainties guidance for authors (reflecting a probabilistic basis for its assignment), it should be italicized. The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU) | OK |
| 351 | 36602 | 21 | 46 | 23 | 46 | 26 | Is this relevant in the WGII context? (The conflict-proneness may be so, covered on lines 28-30). (M Rummukainen, SMHI) | Same comment as above: the point is to show how hotspots can be really useful in some fields, but less so when information is qualitative |
| 352 | 53459 | 21 | 46 | 23 | 46 | 26 | Interesting, but how is this relevant? (Kristie L. Ebi, IPCC WGII TSU) | Same comment as above. |
| 353 | 53460 | 21 | 47 | 17 | 47 | 21 | And can cause co-harms. (Kristie L. Ebi, IPCC WGII TSU) | We agree that these can be related, though not always to cause harm. We have inserted "interrelated" to recognise this. |
| 354 | 53461 | 21 | 48 | 31 | 48 | 42 | Please ensure consistency with the polar chapter. (Kristie L. Ebi, IPCC WGII TSU) | The polar chapter (28) is referenced, and information in that chapter is consistent with that presented here. |
| 355 | 36603 | 21 | 48 | 34 | 48 | 34 | If this is based on a single model, this should be reflected, as a definitive period is quoted, which may give an impression of less uncertainty than so. (M Rummukainen, SMHI) | The reviewer is correct that this was based on only one model and one scenario.Since the FOD, the cited study has been updated for a revised model and alternative RCP-based scenarios. These are now reported. However, only sea ice projections are included in the new study, and we would like to draw attention to winter transportation routes over land/water which were reported in the earlier study. For this reason, we are retaining the earlier figure, which shows sea ice and winter transportation, but based on SRES A1B. Results for sea ice are consistent with the new study. |
| 356 | 48572 | 21 | 48 | 39 | 48 | 40 | Presumably these ships needed to be specially outfitted for the journey, and probably had higher insurance premiums: was that factored into this cost estimate? While I might guess it was not a cost for these two particular journeys, future journeys would probably have to pay fees for standby icebreaker assistance, etc. (Dáithí Stone, University of Cape Town) | We have added details on the vessels' "ice worthiness" and ice breaker backup from a second web-site article (Det Norsk Veritas, 2010). |
| 357 | 53462 | 21 | 49 | 1 | 49 | 10 | Please ensure consistency with chapter 7. (Kristie L. Ebi, IPCC WGII TSU) | Chapter 7 doesn't mention this issue in the FOD, but Chapters 9 on Rural Areas and 13 on Livelihoods and Poverty, do and have now been referenced. |
| 358 | 36604 | 21 | 49 | 17 | 49 | 17 | Would there be some, more official, other reference than Financial Times? (M Rummukainen, SMHI) | This is now replaced by a reference to official statistics (also used in Chapter 25) |
| 359 | 41452 | 21 | 49 | 26 | 0 | 0 | the example of the EU ETS does not fit to the heading; the EU ETS is an environmental policy instrument focusing on limitation and trading of ghg emissions, but it is not a financial instrument (Sven Harmeling, Germanwatch) | Subtitle has been modified accordingly |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| 360 | 53463 | 21 | 49 | 27 | 49 | 36 | Please ensure consistency with the adaptation chapters. (Kristie L. Ebi, IPCC WGII TSU) | Reference is now made to Chapters 14-17, all of which touch on the issue of financial mechanisms |
| 361 | 41451 | 21 | 49 | 35 | 0 | 0 | the statement on the Green Climate Fund being funded through the CER levy is definitely wrong. The CDM levy currently only funds the Adaptation Fund set up under the Kyoto Protocol. A decision how the Green Climate Fund will specifically financed has not yet been taken, a range of options are foreseeable. (Sven Harmeling, Germanwatch) | This sentence has now been deleted. |
| 362 | 36605 | 21 | 49 | 35 | 49 | 36 | "are used" or "will be used"?, under the GCF? (M Rummukainen, SMHI) | The sentence has been removed. |
| 363 | 35112 | 21 | 49 | 39 | 0 | 0 | "21.6.2. Human Migration" I suggest including data from the annual reports from the Internal Displacement Monitoring Centre since they have been monitoring global (internal and external) displacement due to natural hazard-induced disasters, including climate-related disasters, over the past 4 years. Numbers for 2011 show that around 14,9 million people were displaced. Around 90 percent is due to climate-related disasters, and around 90 percent is in Asia. A few mega-disasters often displace huge amounts of people such as the floods in China in 2010. So far the numbers exclude people displaced in slow-onset disasters, such as drought, due to the challenges related to determining causality and forced displacement (rather than voluntary migration) in such cases. The reports are all available at www.internal-displacement.org For more on drought, displacement (includingt cross-border) and human security in Africa, see Kolmannskog 2010, Climate Change, Human Mobility, and Protection: Initial Evidence from Africa, Refugee Survey Quarterly (2010) 29 (3): 103-119. There is also an upcoming publication presenting and exploring some experiences of drought and cross-border displacement as well as policy responses in connection with the 2011 drought and famine in Somalia, see Kolmannskog and Ramstad, Experiences of drought and displacement: Case study of Somalis displaced to Kenya and Egypt due to the 2011 drought, in Climate Change Monitoring and Vulnerability Assessment in Africa (book commissioned by Haramaya University, Ethiopia, scheduled to be published in 2012 by the CAB International publishers). On the legal status of those moving due to climate change and natural disasters, see f ex Kolmannskog 2009, The Point of No Return, Refugee Watch, issue no 34; Kolmannskog and Trebbi 2010, Climate Change, Natural Disasters, and Displacement: A Multi-Track Approach to Filling the Protection Gap, International Review of the Red Cross, issue no 879; and an upcoming publication: Kolmannskog 2012, Climate Change, Environmental Displacement and Int'l Law: Controversies, Consensus and Cosmopolitan Legality, Journal of International Development. In this paper there is some information about a recent initiative: The Nansen Initiative. Norway and Switzerland have given state pledges in the UN to start a state-driven consultation process to arrive at a consensus about some principles to protect people displaced by natural disasters across across borders. In this paper there is also some discussion of the role of the climate agreement: Paragraph 14(f) of the Cancun Agreements invites parties to enhance adaptation by undertaking "[m]easures to enhance understanding, coordination and cooperation with regard to climate change induced displacement, migration and planned relocation, where appropriate, at the national, regional and international levels." (Vikram Kolmannskog, Norwegian Refugee Council) | Our thanks to the reviewer for this detailed comment and suggested citations. We have cited only some here, because this is just an introduction to the issue. We have also mentioned the Nansen Initiative. More details and other citations can be found in other chapters of the report, which treat migration in more detail. |
| 364 | 43707 | 21 | 49 | 39 | 0 | 0 | A report on human migration that is very relevant for the Asia-Pacific region in this section is: Asian Development Bank, 2012: Climate Change and Migration in Asia and the Pacific. Asian Development Bank, 6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines. 94 pp. http://beta.adb.org/publications/addressing-climate-change-and-migration-asia-and-pacific - But this report notes that it is actually very difficult to attribution migration patterns to climate change because there are some closely related driving forces such as poor management of environmental resources. (Martin Manning, Victoria University of Wellington) | We have added this citation as additional support for the statement reporting the difficulty of attributing migration to climate change. |
| 365 | 53464 | 21 | 49 | 39 | 50 | 30 | Please ensure consistency with chapter 12. Also, please see the Foresight report on migration and global change. (Kristie L. Ebi, IPCC WGII TSU) | We have already referenced chapters (including 12) that address this issue. The Foresight report is also cited. |
| 366 | 48246 | 21 | 49 | 50 | 49 | 53 | There is also evidence in the opposite way. After an examination of some studies in different areas of the world, Black (2001) concludes that it is problematic to say in each case that environmental decline should represent the main reason for their conflicts and therefore, migrations. Some of those findings are briefly summarized as follows: 1. Black describes one study in Mexico (Schwartz and Notini 1995, cited in Black 2001) in which after the analysis of relevant statistics data will likely confirm that desertification is one of many factors contributing to migration from this region' (Black 2001). 2. Another study of emigration from the Senegal River Valley in Mali shows that "during the drought of the mid-1980s, migration actually declined rather than increased. In turn, there was a clear reason for this, since to migrate requires an initial cash investment to pay for travel and associated expenses on arrival, and an economic downturn reduces the ability of families to make such an investment" (Findley 1994, cited in Black 2001 p.7). 3. Black also argues that "within the Sahel, and indeed in other semi-arid regions, there is a tradition of migration that extends back over decades, and often centuries, and which ranges from nomadic pastoralism to long-distance trade, as well as the permanent relocation of individuals and families. In turn, these migrations, though rooted certainly in the difficult environmental conditions of the region, and the need to diversify income earning opportunities, are not necessarily related to a decline in those conditions" (Cordell et al., 1996; Rain, 1999, cited in Black 2001 p. 6). Black also argues that The Dust Bowl is NOT an example where drought was the cause of migration, since it was mainly due to the fact that the people lost the control of the farms. (Jason Garcia-Portilla, University of Sussex) | We have added the Findley and Black references, as offering counter examples. |
| 367 | 40003 | 21 | 50 | 2 | 50 | 2 | insert 'it' after 'context' (Peter Burt, University of Greenwich) | Corrected |
| 368 | 38382 | 21 | 51 | 12 | 51 | 13 | Make it clear in the caption that this relates to velocity of climatic zones. (Claire Goodess, University of East Anglia) | The caption has been revised |
| 369 | 51202 | 21 | 51 | 29 | 0 | 0 | Section 21.7. The author team should fully develop this section by the 2nd-order draft. (Katharine Mach, IPCC WGII TSU) | The section has been substantially rewritten to address this and related issues. |

| # | ID | Ch | From Page | From Line | To Page | To Line | Comment | Response |
|---|---|---|---|---|---|---|---|---|
| **370** | 51203 | 21 | 51 | 34 | 0 | 0 | Frequently Asked Questions -- The author team should ensure full questions and answers in this section by the 2nd-order draft. FAQs are an important component of the report, also part of the plenary approved outline, and the author team is very much encouraged in developing informative and interesting questions and answers with consideration of the guidance and feedback that has been provided to author teams. (Katharine Mach, IPCC WGII TSU) | The FAQs have been fully developed. |
| **371** | 51173 | 21 | 73 | 0 | 0 | 0 | Table S21-2. For countries along relevant regional borders, the author team should ensure that the chapter-specific designation here has been confirmed by the corresponding regional chapters. (Katharine Mach, IPCC WGII TSU) | This Table has been checked against Chapter designations. |
| **372** | 51204 | 21 | 73 | 0 | 0 | 0 | Table S21-2. As a minor point, it would be helpful to clarify what the plus symbol stands for in the 1st column. (Katharine Mach, IPCC WGII TSU) | This symbol is to be found in the caption. |
| **373** | 41522 | 21 | 82 | 0 | 0 | 0 | Figure 21.1: In the colour key at the bottom of Fig 21.1 I suggest you replace "Australia and New Zealand" with "Australasia", to be consistent with the regional chapter titles. (David Wratt, NIWA, New Zealand) | The Figure has been replaced with an AR5 version, using the correct terminology. |
| **374** | 53980 | 21 | 82 | 0 | 0 | 0 | Figure 21-1: For the regions defined in Part B, it would be useful to provide a full legend of all 9 chapters (by adding small islands and open oceans) and include associated chapter numbers. (Yuka Estrada, IPCC WGII TSU) | The Figure has been replaced with an AR5 version, and all regional chapters will be indicated. |
| **375** | 53982 | 21 | 84 | 0 | 0 | 0 | Figure 21-3: This figure seems to provide too much unnecessary details to convey the statement in line 43-46 of page 15. This type of figure would be useful to summarize and report complex results of studies, but for the purpose of this assessment, that is not called for. It seems to be sufficient to have a simplified version of this figure that illustrates and communicates the main points more explicitly to readers. (Yuka Estrada, IPCC WGII TSU) | This figure has been extensively revised. |
| **376** | 53983 | 21 | 85 | 0 | 0 | 0 | Figure 21-4: The visibility of this figure needs to be improved. (Yuka Estrada, IPCC WGII TSU) | This figure has been extensively revised. |
| **377** | 53984 | 21 | 88 | 0 | 0 | 0 | Figure 21-7: The visibility of this figure needs to be improved. Individual charts are too small. (Yuka Estrada, IPCC WGII TSU) | This figure has been extensively revised. |
| **378** | 51205 | 21 | 90 | 0 | 0 | 0 | Figure 21-9. Is it possible to present these plots over a map of Europe for clarity? (Katharine Mach, IPCC WGII TSU) | This figure has been extensively revised. |
| **379** | 53985 | 21 | 90 | 0 | 0 | 0 | Figure 21-9: The visibility of this figure needs to be improved. Fonts are too small to read. (Yuka Estrada, IPCC WGII TSU) | This figure has been extensively revised. |
| **380** | 51206 | 21 | 94 | 0 | 0 | 0 | Figure 21-13. For this figure, it would be helpful to specify the relevant time frame and baseline for projections presented. (Katharine Mach, IPCC WGII TSU) | This figure has been extensively revised. |
| **381** | 51207 | 21 | 97 | 0 | 0 | 0 | Figure 21-16. In the figure caption where the author team uses the word "velocity," are there relevant directions, or is the word "speed" more accurate? (Katharine Mach, IPCC WGII TSU) | The word velocity is taken from the original article. |