#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
1	35506	2	0	0	0	0	On line 28 and other places in this chapter, the term 'wicked problem' strikes me as vague and misleading which deflects attention from the reality that the existing global economy with is emphasis on on-going economic expansion and treadmill of production and consumption heavily reliant on fossil fuels constitutes the 'wicked problem' that contributes to anthropogenic climate change (Baer 2012). (Hans Baer, University of Melbourne)	We define wicked problems in Section 2.1.2 and link them to complexity. There is no single wicked problem, there is a class of problems. Some of the reduncy around this has been removed and it is better placed within the logic of the chapter
2	35602	2	0	0	0	0	Ayyub, et al. (2011) demonstrated a need to develop an inventory structure and models using Washington DC as an example in order to assess impacts of climate change. In this paper, the inventory is limited to the built environment and is human centric, i.e., what is best for humans is not necessary best to other living systems. Uncertainties associated with the inventory and its projections are great. The report covers this area of inventory; however in an unstructured and unsystematic manner. Ayyub, B. M., and Braileanu, H. G., and Qureshi, N., "Prediction and Impact of Sea Level Rise on Properties and Infrastructure of Washington, DC," Risk Analysis Journal, Society for Risk Analysis, 2011 Oct 28. doi: 10.1111/j.1539-6924.2011.01710.x. (Bilal Ayyub, University of Maryland)	We have considered this for the impacts section but cannot cover it due to space limitations
3	35603	2	0	0	0	0	Note: I will gladly send you cited figure and papers upon request. ba@umd.edu (Bilal Ayyub, University of Maryland)	See above
4	35744	2	0	0	0	0	This is a very important chapter addressing the foundations of decision-making within the limits of climate change impact, adaptation and vulnerability assessment (CCIAV). However, natural disasters are not always isolated events, and powerful natural disasters often trigger secondary disasters or technological accidents. This is a most complex scenario and demands reorientation of emergency response systems and procedures for responding to and mitigating the impacts in the 21 st century (Cruz and Okada, 2008) . This aspect is not adequately covered in this chapter. The technological emergencies created by unintentional hazardous material loss of containment due to natural disasters have been referred to as na-tech events (Showalter and Myers, 1994). Often this also results in to a domino effect. Such complex events are likely to increase in frequency and severity in future due to climate change. There is growing evidence that natechs may pose tremendous risks to regions which are unprepared for such events. Although the heirachy described in fig.2-1 takes care under the definition of Institute,but will need a different set of action plan (at local, regional, national and global level) and may be considered to be incorporated in this chapter at an appropriate place so that its linkage with chapter 14- 16 and 19-20 can be established. (Jitendra Desai, Reliance Indusries Limited)	Noted - for inclusion in institutional section
5	35745	2	0	0	0	0	Climate change can have an effect on natural hazards threatening chemical installations. Therefore the effects of climate change have to be integrated in Natech risk management of operators, public authorities and other stakeholders. This will require: a. Development of approaches for the consideration of climate change in the analysis of risks by natural hazards for regions, sites and installations; b. Methods for the consideration of climate change in the assessment of the risks by natural hazards at sites or installations; c. Development of approaches for the consideration of natural hazards and climate change in the elaboration or amendment of design and lay-out criteria, construction, rules, standards, guidelines; d. Approaches for implementation of adaptation measures at new sites or for new installations; e. Approaches for implementation of adaptation measures at existing sites or existing installations; f. Tools for the evaluation of these adaptation measures. (Jitendra Desai, Reliance Indusries Limited)	Cannot incorporate due to space limitations. More suited to the settlements chapter
6	35799	2	0	0	0	0	There is a lack of integration between the perspective of risk assessment described in Chapter 2, and the governance perspective developed in Chapter 8. Specifically, Chapter 2 provides a model of the iterative risk management framework in Figure 2-2 (Page 53, Chapter 2). However, Chapter 8 uses a different model based on a governance perspective – as exemplified by the circulation of power in public decision making shown in Figure 8-1 (page 97, Chapter 8). The more complete model of decision making based on the governance perspective is described in Sections 8.4.1 and 8.4.2. In addition, Section 8.4.2.4 lines 45 & 46 refers to social learning processes (References to Bramwell 1989 and Brulle 2000). These three models of decision making (risk assessment, governances, and social learning) are dramatically different in their basic assumptions, and the respective roles of information political power and economic wealth. Yet there is no mention of any other perspective besides risk assessment in Chapter 2, and there is only a passing reference to risk assessment in Chapter 8. This lack of integration of perspectives is in my view, problematic, and needs to be addressed. Because there is a lack of engagement with the relevant social science perspectives, the two chapters end up being a polyglot of perspectives, without any coherent integration. (Robert Brulle, Drexel University)	Our view is that these are not mutually exclusive and have brought the overall explanation to the front of the chapter. We consider governance and social learning to be very important aspects of the risk management process and are widely supported in the literature on that point. Chapter 8 is very process based and we have beefed up the distinction between process and outcome (or object)-based assessments. Need to add something in the governance section, though.
7	35813	2	0	0	0	0	The report systematically fails to acknowledge or integrate the extensive and well-developed literature on the political economy of climate change. In Chapter 20 (page 7, lines 41-43), the report briefly mentions this concept, and cites one article. This overlooks an extensive empirical literature regarding the economic dynamics of climate change that draws on both world systems theory and political economy. This literature needs to be added to ensure that the IPCC report accurately reflects the complete scientific literature in this area. The specific areas where this occurs are listed below. (Robert Brulle, Drexel University)	The reviewer is correct - here it is most appropriate for the instiutional and governance sections

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
8	35819	2	0	0	0	0	This chapter purports to describe the "Foundations for Decision Making", which centers on the idea of a decision framework, defined on page 5 (lines 41 & 42), as "the sets of ideas, values, rules, heuristics, and habits that people use to make the many choices they face." Yet this chapter completely ignores the empirical social science literature on how institutionalize decision making actually takes place. Instead, we are provided with an abstract and unrealistic model of a desired procedure of how decision making should take place. Risk assessment, like cost benefit analysis, is a methodological procedure, not an actual analysis of the political decision making process. In both the sociological and political science literature, decision making is the outcome of a political process in which competing factions strive to ensure that their preferred policy outcomes are instituted. This is a process that involves dialog and the development of mutual understanding, as well as competition and the promulgation of misinformation. More specifically, the sociological literature focuses on the components that influence the probability of success in the political process, including cultural power, levels of resource mobilization, and the nature of the political opportunity structure. The political science literature has developed an extensive literature based on the advocacy coalition framework, in which different factions based on different ideological positions, compete and/or cooperate to influence the decision making process. Both of these perspectives include a discussion of the role of information in the political decision making process. Yet despite their relevance to the discussion of the "Foundations of Decision Making", neither political science or sociological models of the decision making process appear in this chapter. I think it is highly relevant that none of the authors or reviewers of this chapter has any formal credentials in either sociology or political science. In addition, there is no justification provided as to why risk assessment is assigned its primary function, and for the neglect of the perspectives of sociology and political science other than the arbitrary biases of the authors of this chapter. In my opinion, this chapter needs to be heavily revised, and additional authors be brought into the mix so as to provide a more empirically based and robust analysis of decision making processes. I suggest that Dr. J. Craig Jenkins of Ohio State University, Dr. Douglas McAdam of Stanford University, and Dr. Paul Sabatier of the University of California - Davis be consulted in the revision of this chapter. Additionally, the literature in this area is rather vast, and cannot be summarized here. Some of the key literature is provided below so as to provide the authors with examples of these perspectives. (Robert Brulle, Drexel University)	Due to time limitations we have been unable to do this justice and the reviewer will be much aggrieved (justifiably). As to the formal credentials of authors, a political scientist was asked and declined and authorship was limited by the skill sets nominated by government. The best we can promise at present is to do a better job in the next round, having put in a brief treatment. The reviewer is thanked for raising this point and the excellent references.
9	35820	2	0	0	0	0	Possible references: Bartley, T. 2007. How Foundations Shape Social Movements: The Construction of an Organizational Field and the Rise of Forest Certification. Social Problems 54(3), 229-255 Benford, R. D., & Snow, D. A. 2000. Framing processes and social movements: An overview and assessment. Annual Review of Sociology, 26, 611-639. Brulle, Robert J. 2010. Politics and the Environment, in Kevin T. Leicht and J. Craig Jenkins (eds), The Handbook of Politics: State and Civil Society in Global Perspective Springer Publishers, New York, NY Brulle, Robert J. 2013. The Development, Structure, and Influence of the U.S. National Climate Change Movement in Climate Change Policy and Civil Society, edited by Yael Wolinsky, Washington DC: Congressional Quarterly Press Cigler, Allan J., and Loomis, Burdett A. 1995. Interest Group Politics 4th Edition Congressional Quarterly Domhoff, G. William. 1998. Who Rules America? Mountain View, Ca.: Mayfield Publishing. (Robert Brulle, Drexel University)	Due to time limitations we have been unable to do this justice and the reviewer will be much aggrieved (justifiably). As to the formal credentials of authors, a political scientist was asked and declined and authorship was limited by the skill sets nominated by government. The best we can promise at present is to do a better job in the next round, having put in a brief treatment. The reviewer is thanked for raising this point and the excellent references.
10	35821	2	0	0	0	0	Possible references continued: Jenkins J.C. and W. Form 2005. Social Movements and Social Change, pp. 331-349 in Janoski et. al. The Handbook of Political Sociology Cambridge Loomis, B.A., and Cigler, A.J. 1998 "The Changing Nature of Interest Group Politics." Pp. 1-33 in Cigler, A.J., and Loomis, B.A., (ed.) Interest Group Politics. Congressional Quarterly Press: Washington DC. Lounsbury, M., M. Ventresca, and P. Hirsch. 2003. Social movements, field frames and industry emergence; a cultural-political perspective on U.S. recycling. Socio-Economic Review 1: 71-104 Rochon, Thomas R. 1998. Culture Moves. Princeton, N.J.: Princeton University Press. Rootes, C. and Brulle, R.J. 2011 Environmental Movements, in McAdam, D., and Snow, D. (eds.) The Blackwell Encyclopedia of Social and Political Movements. Blackwell: New York, NY Sabatier, P. and H. Jenkins-Smith 1993. Policy Change And Learning: An Advocacy Coalition Approach. Westview Press. Sztompka, Piotr, 1993, The Sociology of Social Change, Blackwell: Cambridge MA Tarrow, Sidney. 1998. Power in Movement (2nd ed.) New York: Cambridge University Press (Robert Brulle, Drexel University)	Due to time limitations we have been unable to do this justice and the reviewer will be much aggrieved (justifiably). As to the formal credentials of authors, a political scientist was asked and declined and authorship was limited by the skill sets nominated by government. The best we can promise at present is to do a better job in the next round, having put in a brief treatment. The reviewer is thanked for raising this point and the excellent references.
11	37079	2	0	0	0	0	Publications which are challenging the issue of the climate change impacts on hydrology are partly omitted, as for instance Demetris Koutsoyiannis' publications - see http://itia.ntua.gr/en/byauthor/Koutsoyiannis/0/ (Christophe Cudennec, Agrocampus Ouest)	We feel this is for another chapter
12	37081	2	0	0	0	0	Rainfall change may also be in terms of spatial organization, size, movement at the event scale and thus of climate through statistics (Christophe Cudennec, Agrocampus Ouest)	We feel this is for another chapter
13	38200	2	0	0	0	0	The distinctions and interlocking nature of the levels of analyses noted in Figure 1 gets lost in the review. For instance, much of the information about decision makers seems to imply individuals are making the decisions, a part from a group context. The information about individuals is important, but much of the discussion about decision makers is at the beginning of the chapter and feels disconnected to the information about, for instance, use of scenarios. (Janet Swim, The Pennsylvania State Universi)	Figure 1 has been deleted and the material on decision-makers expanded.
14	38201	2	0	0	0	0	I did not see anything that was about how (small) groups make decisions. For instance, the report could talk about team cognition or mental models. Mohammed, <. c., Tesler, R., & Hamilton, K. (2012). In Salas E., Fiore S. M. and Letsky M. P. (Eds.), Time and team cognition: Toward greater integration of temporal dynamics. New York, NY, US: Routledge/Taylor & Francis Group, New York, NY. http://search.proquest.com/docview/916529999?accountid=13158; Mohammed, <. c., Ferzandi, L., & Hamilton, K. (2010). Metaphor no more: A 15-year review of the team mental model construct. Journal of Management, 36(4), 876-910. doi:10.1177/0149206309356804 (Janet Swim, The Pennsylvania State Universi)	Need to add something on this

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
15	38207	2	0	0	0	0	It seems like much of the discussion about decision making, particularly at the beginning of this chapter is about decision making in general and is not linked to decsions about climate change. Relatedly, the review does not specify exactly what the decision making is about. There are decisions about whether climate change is serious and caused by humans, individual decision about personal behavior that could reduce personal contributions to climate change (individual conservation behaviors, investments in home upgrades, civic engagement, personal decisions about whether to support, reject, or develop of mitigation and adaptation policies), decisions made by groups of individuals such as boards of directors and government agencies (e.g., regulating business emissions, whether to invest in natrual gass drilling, solar panels, etc.). Different decision making topics have different types of predictors.. It is not clear how much of what is reviewed here is applicable to different decision making topics. (Janet Swim, The Pennsylvania State Universi)	The links to CCIAV decisions have been made much clearer - many of these reviewer's examples are about mitigation. However, we have tried to take these comments on board with respect to CCIAV
16	39477	2	0	0	0	0	General comments: I am absolutely delighted that this chapter is included. It reflects vitally important research and reflexivity about transdisciplinarity, and marks a really important step forward in science-policy-practice interaction. I hope that the next iteration of the other chapters will take some of the issues and concerns raised on board. The novelty of this area needs to be taken on board, though - first, most 'normal' scientific researchers are unaccustomed to the kind of reflection and self-critical analysis of their work that integrative transdisciplinarity necessarily involves, so it can feel (personally) uncomfortable to address the issues raised. And secondly, the community thinking in these ways is relatively small, so it lapses easily into jargon and conceptual shorthand - a form of reductionism itself, if not exactly dogma. I've tried to highlight areas where recommendations for good reflexive practice appear to slip too closely to preaching.... (overall the chapter is well-written in that regard, but the executive summary is less so). (Sarah Cornell, Stockholm Resilience Centre)	Thanks - we have endeavoured to make the language more acceptable to a wide audience and clarified terminology
17	40711	2	0	0	0	0	General Comments. This chapter covers two hugely important topics. First, how climate science is used in making decisions about actions to address climate change (both mitigation and adaptation), and second, understanding the decision-making process and the entry points for ensuring that climate science is adequately included. The chapter rightly points out that the decision-making process is complex and is affected by a range of factors. While the bullets at the beginning of the chapter provide a good summary, the material in the chapter could be much more clear and concise. The chapter takes a lot of space to make the point that humans are not very good at making decisions in the face of uncertainty and that climate change offers huge uncertainties. Laying out more clearly types of decision-makers and the decisions they make would help shape the chapter. Introducing fewer frameworks and terms will also help, as will eliminating much of the “academic-sounding jargon” that, unfortunately, renders reasonable ideas unnecessarily obscure. I found the chapter to be full of lists and terms that were not well developed or well defined. For example, 6 principles of effective decision support are listed on page 6, line 50 through page 7, line 11 but are brought up again. On page 8, lines 19-30, five types of risk are listed, but again, are not developed in the chapter. On page 11, lines 10-53, we learn about decision criteria as outcome-based and process or rights-based (I am not sure those are the same thing) and further that outcome-based criteria include optimality, cost-effectiveness, bounded costs and multi-attribute decision theory. The next paragraph on page 12, line 5 mentions “modern portfolio theory.” Page 22. Lines 34-42 mention that the five elements of effective decision processes can be summarized as a choice task and a decision structuring task. Page 14, lines 47-54 describe several types of modes of learning: including unplanned learning, evaluation, adaptive management and deliberation with analysis. The section on Solution attributes, on page 23, lines 8-49, says that solutions need four attributes to be successful. The section on cross-cutting and contextual attributes, on page 24, lines 1-, 54 and page 25, lines 1-14, includes yet another list of five attributes. On page 34, lines 20-21, there is a list of six types of decision-making strategies. The issue in the chapter is that there are lots of lists, few of which are fully developed or carried through in the chapter, leaving the reader overloaded with terms without a good understanding of how	These are important points - we have made the effort to make this simpler and have gone some of the way, but the truth is that many of these are contextual and we have not yet got all of that right.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
17.2	40711	2	0	0	0	0	they all fit together and how they relate to decisions and decision-making related to CCIAV. Other terms that I underlined that weren't sufficiently developed while reading the chapter include: "problem-based, solution- or actor-based and reflexive scenarios, exploratory scenarios,", "wicked and tame problems," "sequential decision approach," "reach options approach," "control theory," "weak institutions," "governance as a top down and/or bottom up approach, "the precautionary approach," "dominant modes of thought in a society," "holistic and analytic thinking," "the spiritual and the ecological" cultural models, "normative and descriptive decision-making methods," "positivistic/constructionist, proscriptive diagnostic and sometimes top down and bottom up," "actor-network theory," "scientific-rational, institutional, power discourse, economic, and discursive-consensus based," decision-making strategies, and "transformation," among others. ` Organization of the Chapter The chapter could be more clearly organized. It would be more clear to say what the problems are with decision-making in climate change (risk, uncertainty, use of scenarios) and what decision science and other disciplines such as public policy, can tell us about the range of decisions that need to be made and the range of decision-makers who make those decisions. That could be followed by what factors affect decision-making (evidence, values, experience, culture, etc.) and what decision support and climate services offer. The chapter can include examples of decision-making processes that have occurred and which have been more or less effective (e.g. the examples from Canada, Bangladesh, NAPAs, etc.) This chapter is foundational for the other chapters in this WG2 report, so it would also be good to explain how the contents of this chapter related to the other chapters in the report. (Karen Hardee, Futures Group)	
18	41146	2	0	0	0	0	Great to see this new section in the AR5. It is an essential chapter that lays the groundwork for illuminating the context within which decisions related to climate change are made – which is a complex interdisciplinary multi-scalar system compounded by coupled human-nature inter-dependencies, and fraught with issues that make it difficult to navigate. Great to see the concept of mainstreaming infused throughout this section on decision making! There is a significant focus on risk management as the frame for CCIAV, but no mention in this chapter of social-ecological systems. Given the recognition in the SREX IPCC report that "risk management decisions are made within social-ecological systems (a term referring to social systems intimately tied to and dependent on environmental resources and conditions)", there should be reference to social-ecological systems in this chapter (see my general comment related to SES for chapter 1 as well). (Susan Evans, WWF-Canada)	Need to add socio-ec systems
19	41230	2	0	0	0	0	Introduction This chapter addresses the foundations of decision-making within the limits of CCIAV. It shows that decision-making is more complex than the rational linear models predominantly used in the previous assessments. Amongst other things, it reveals that socio-cultural factors play a major and integral role in how decisions are made. It emphasizes that complex problems require a range of participatory approaches that combine expert assessment and social learning processes to evaluate, implement and learn from actions. The issue of tackling Climate Change is complex in nature and global in scale. To tackle the issue requires decision-making at the global scale. This is a task of unprecedented dimensions To perform it, one must first understand how groups of people make decisions. It quickly emerges that decision-making is both intellectual and behavioural in nature, and heavily influenced by value systems. . This requires the inputs from various classical disciplines of study, deliberation and application. The method chosen has been to use a concatenation of the results of studies carried out within these separate disciplines (from the humanities) to arrive at a broad fit to the problem that might work. It is not the most satisfactory approach, but in the absence of a single tailor-made discipline to deliberate on the issue, it is the best. Evaluation The ultimate aim of the UNFCCC is to reach a global consensus on what to do about containing the effects of climate change. Towards this end, it is crucial to understand how individuals, and the groups and the institutions they form make decisions. As this is the aim of this chapter, its importance cannot be under-estimated.. Indeed, its inclusion in these reports was long overdue. Possible problem The chapter itself is well-structured and written, and will be certainly accessible to the new cadre of experts and scholars. However, we see a possible problem when the entire readership of the report is considered. To achieve its aims, this chapter must first be read by all the intellectual stakeholders in climate change. The problem is that a large segment of the readership will come from fields other than the humanities who would find the text difficult to read. A large proportion of these will include readers from the physical sciences. These are used to linear thinking and the problem-based approach where the solutions are relatively simple. They will not be used to the language describing the new socio-cultural and behavioural contents included here. They will find the chapter difficult to read as the language is largely unfamiliar and the references not from their own disciplines. There is a real danger that a two-tier readership situation could develop, where readers from the humanities will be able to read and appreciate the contents of the chapter, while others will find it incomprehensible and shun it altogether. Recommendations This is not a simple issue to resolve. The perceived problem can be partially pre-empted by the use of copious concrete-operational examples describing, e.g., case studies relating to the topics covered. One would also like to explain specialised terms in layman's language wherever possible. Alternatively, one could consider including a section at the end of the chapter that summaries the salient points of the chapter in simple English that is legible to all. (Anirudh Singh, University of the South Pacific)	We have tried to make the language more non-technical and improve the synthesis. Only partially sucessfully. We do not take a stand on the need for consensus, bearing in mind that decision-making is likely to remain messy in this area. We have limited space to add too many practical examples and will try to use these judiciously.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
20	41302	2	0	0	0	0	I do not think that the psychological literature on decision making is represented well in this chapter. As the authors acknowledge, psychological processes are important in climate change related decisions, be it in the political arena or when considering the public's contribution to climate change as consumers or voters. The authors include a section on people making decisions (2.2.3), however, the references do not include more than a couple of psychological contributions, and these are partly not related to decision making or dated. In general, the psychological literature is not covered well and claims are made concerning gaps in research when in fact a whole literature exists on the topic in psychology (e.g., concerning the relationship between values and decision making). I list a number of pertinent references, but I strongly suggest that one or two psychologists be taken on board as authors of this chapter. (Richard Gifford. Psychology's essential role in alleviating the impacts of climate change. Can Psychol/Psychologie canadienne 2008, 49:273–280. Daniel Kahneman & Amos Tversky (Eds.) (2000). Choices, values, and frames. Cambridge, UK: Cambridge University Press. Christian A. Kloeckner. Towards a Psychology of Climate Change. In: W.L. Filho (ed.), The Economic, Social and Political Elements of Climate Change, Climate Change Management, Chapter 11, pp. 153-173). DOI 10.1007/978-3-642-14776-0_11, Ben R. Newell & Andrew J. Pitman. The Psychology of Global Warming. Bulletin of the American Meteorological Society. Volume 91, Issue 8 (August 2010) pp. 1003-1014. doi: 10.1175/2010BAMS2957.1 (Gisela Böhm, University of Bergen)	We have greatly increased the coverage of psychological issues and have them better organized
21	41303	2	0	0	0	0	The May-June 2011 issue of the American Psychologist is a special issue devoted to "Psychology and Global Climate Change." http://www.apa.org/science/about/psa/2011/06/climate-change.aspx Here are the titles of the articles, all of which may be relevant: - Psychology's contributions to Understanding and Addressing Global Climate Change - Human Behavioral Contributions to Climate Change: Psychological and Contextual Barriers - The Psychological Impacts of Global Climate Change - Adapting to and Coping With the Threat and Impacts of Climate Change - The Dragons of Inaction: Psychological Barriers That Limit Climate Change Mitigation and Adaptation - Contributions of Psychology to Limiting Climate Change - Public Understanding of Climate Change in the United States (Gisela Böhm, University of Bergen)	We have greatly increased the coverage of psychological issues and have them better organized
22	42464	2	0	0	0	0	Overall, this chapter could be improved by: (Shahbaz Mushtaq, University of Southern Queensland)	See below
23	42465	2	0	0	0	0	Recognising the need for 'discussion support system', which not only overcome the limitations of conventional decision support tools but are also conducive to enhancing learning and improved decision making. Please see the website below: (Shahbaz Mushtaq, University of Southern Queensland)	Thanks for the document - need to reference
24	42466	2	0	0	0	0	http://www.apn-gcr.org/newAPN/activities/CAPaBLE/2010/CBA2010-07NSY-Stone/CBA2010-07NSY-Stone-FR%20FINAL.pdf (Shahbaz Mushtaq, University of Southern Queensland)	Thanks for the document - need to reference
25	42467	2	0	0	0	0	Deleting some less relevant discussions for example NAPA (Shahbaz Mushtaq, University of Southern Queensland)	We have to have this in but have made it more focused
26	42585	2	0	0	0	0	I would strongly argue that the range of climate systems and the associated types of decision systems is just not understood by industry, government, the public and certainly not the media. I believe this issue needs to be address 'up-front' in Chapter 2 (a Chapter theme that has long been needed in IPCC outputs). (Roger Stone, University of Southern Queensland)	This is more a Chapter 21 issue, we feel
27	42621	2	0	0	0	0	This is a fascinating chapter that augments the other information in WGII very well. The definitions of risk repeat themselves and seem somewhat disorganized; it would be good to track all mentioned definitions and streamline them, perhaps in a separate box. Increasing the number of examples that relate the text to CCIAV would increase readability. Some of the sections seem disconnected, ie: would be good to integrate some of the technical risk terminology from the beginning into the later sections on climate services, NRM, etc, for continuity. Greater discussion of how humans understand probabilities would be useful. Relevant resource on that topic: Suarez, P. and Tall, A. (2010). Towards forecast-based humanitarian decisions: Climate science to get from early warning to early action. Humanitarian Futures Programme. London, Kings College. (Erin Coughlan, Red Cross / Red Crescent Climate Centre)	Thanks. Have cleaned up the risk sections and included major terms in the volume glossary
28	42769	2	0	0	0	0	The discussion of laws and discussion of law, legal structures and institutions, and related constraints and opportunities created by legal structures and institutions at the national and subnational level, is extremely thin and should be expanded. For example, in the United States, adaptation options may be constrained by property rights (through the US Constitutional takings doctrine as well as state property laws) and by governance structures created by laws. Another important example is the role of land use planning laws and regulations at the state and local levels in incentivizing or impeding adaptation, both structurally and in the context of ongoing decisionmaking. A discussion of the role of law and legal institutions seems essential to this chapter's effectiveness in explaining constraints and opportunities that shape the available options for adaptation. This chapter mentions this concept in the broadest possible way, but should be expanded to include a more robust discussion. (Sean Hecht, UCLA)	Accepted but we are seriously constrained for space. Need to get a specialist for the next round
29	43112	2	0	0	0	0	Most importantly, up front in Chapter 2 Foundations for decisionmaking, readers should be alerted to the existence of natural, internal, multi-decadal change and a survey of policy and adaptation decisions that will and will not be affected. (Gary MEYERS, CSIRO)	Cannot agree with this statement. It is more suited to Chapter 30 and in any case, much of what is being interpreted as natural variability is in fact non-linear climate change
30	43491	2	0	0	0	0	There are details to be made in the treatment of the concept of risk from the geographical point of view. The natural –climate- risk must be understood as an expression of territorial actions carried out by humans in the territory who have not taken into account the natural functioning of the environment where they occur. So if the man does not respect the dynamics of the physical land, infrastructure, economic activities, housing to develop man are deemed to be vulnerable to the development of a climatic event of extraordinary range (Olcina, 2007). (Olcina Jorge, University of Alicante)	We do cover maladaptation and exposure but not in this detail

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
31	43691	2	0	0	0	0	I would like to congratulate the authors of this chapter for focussing on the structures that are needed to address uncertainties about the future, more clearly than is currently being done in Chapter 1. However, this does raise the question of how much focus should be explicitly on CCIAV while at the same time dealing with links to some much broader aspects of risk management in social and economic structures. If it is relevant, I would strongly support the need for those linkages to be covered in this chapter rather than having it retreat into a narrow focus just covering the direct effects of climate change. Our experience in NZ has shown that local governments have to integrate adaptation to climate change with many other aspects of socio-economic development and so, if science tries to always separate out climate change issues, that can actually become an impediment for good adaptation responses. (Martin Manning, Victoria University of Wellington)	We have tried to integrate these concerns as much as possible
32	43692	2	0	0	0	0	But this chapter is too long. Some of the points that are being covered in sections 2.2 and then 2.3 could be merged. Also, while it is covering a wider range than was in the original WG2-AR5 outline for the chapters, moving back to something closer to the originally proposed 5 section headings for the chapter might make it more readable by others. (Martin Manning, Victoria University of Wellington)	Done
33	43858	2	0	0	0	0	It seems the only or main suggestion provided in this exec summary for dealing with complexity and uncertainty is participatory adaptive management. This is very important, but there are other important ways of making decisions under uncertainty through the use of heuristics, small-scale trials and decision triggers within pathways approaches, for example. I believe it will be valuable to mention these aspects upfront and briefly elaborate later in this Chapter. (Russell Wise, CSIRO)	Agreed - but we have decided more opt for process - these need to be in the body of the text
34	43859	2	0	0	0	0	The word "institutions" is used too loosely. The word 'institutions' is not a synonym for 'organisations' as seems to be used in this Chapter. Institutions are the formal and informal rules that guide, constrain and enable individuals and organisations to make decisions and take action. The structure of institutions and organisations are referred to as governance arrangements. i think it is important to be accurate here, as loosely used terminology increases uncertainty. (Russell Wise, CSIRO)	Agreed and have tried to tighten terminology
35	43861	2	0	0	0	0	Until this point it is still very ambiguous about how risk and uncertainty are being dealt with and how they relate to each other. Sometimes it seems the authors use these interchangeably and are viewed as the same. In other situations these are discussed as if they are different things. This makes the reading and interpretation of this chapter confusing at times. (Russell Wise, CSIRO)	Uncertainty is different to risk in the chapter and is made quite clear in the definitions
36	43864	2	0	0	0	0	Please use the word "damage" instead of "damages" throughout this chapter and more broadly. These have very different meanings. Damages is the term for "Monetary compensation that is awarded by a court in a civil action to an individual who has been injured through the wrongful conduct of another party". In recent years it seems that scientists are bastardising the word and making up a new word for the plural of damage. "Damages" is not the plural of "damage"; there is no plural. (Russell Wise, CSIRO)	Noted
37	43878	2	0	0	0	0	The terms "adaptation policies", "adaptation options", "adaptation actions" are often used interchangeably and sometimes inconsistently. If the term "adaptation policies" is used does this exclude or include 'options' and 'actions'? This needs to be clarified upfront in this Chapter and these terms unambiguously defined/explained and used. (Russell Wise, CSIRO)	We could make the distinction between 'policies' as legislated by government, and options/actions which related more to the technical aspects
38	44162	2	0	0	0	0	In the beginning of this chapter it is stated that CCIAV aim at yielding benefits and reduce losses. In the subsequent chapter, this concept is merged with the assessment and management of risk. However, risks are defined only by adverse effects of climate change in the glossary. Thus, by reducing the approach of CCIAV to risks, the beneficial side of climate change is left out. (Anne Holsten, Potsdam Institute for Climate Impact Research)	Glossary definition has been changed to reflect this
39	44165	2	0	0	0	0	The chapter is very scarce in literature sources. (Anne Holsten, Potsdam Institute for Climate Impact Research)	Many more have been included
40	44173	2	0	0	0	0	The given outline is not reflected in this chapter. Especially the topic of multi-metric valuation as given in the outline is relevnat here. (Anne Holsten, Potsdam Institute for Climate Impact Research)	We have still opted for a different structure but is closer and multi-metric valuation has been made more prominent in 2.2.1.2
41	44847	2	0	0	0	0	Very general comment on first impressions of this chapter: while inclusion of the topic on 'foundations for decision-making' is important and necessary, the content of the chapter itself is far too long, and (sorry but...) reads more like a high school text book than a synthesis report on best up-to-date knowledge on decision-making in a climate change policy context. Also, there are many references to "the literature" but no examples or citations given, or strategies/methodologies for how literature was solicited and synthesised. The structure and scope of this chapter could be improved by making a far more concise and focused discussion in terms of how decision-making has been conducted to date with respect to climate change policy (and information or 'intelligence' that underpins it), rather than a synthesis on theories (which has not been comprehensively addressed, with key fields, theories, and frameworks not mentioned - e.g. political and policy sciences literature, such as Lasswell, H.D., 1956. The decision process: seven categories of functional analysis. Bureau of Governmental Research, College of Business and Public Administration, University of Maryland). Furthermore, this chapter could benefit from a synthesis on WHAT and HOW decisions have been made in the policy process (a summary from case studies) that have used information from previous IPCC assesments and/or specific climate change data/knowledge - has the desison-making process improved with more information and sophisticated assessments over the years? (Carolina Adler, Swiss Federal Institute of Technology (ETH) Zurich)	Length has been cut. There has been no process within the literature along the lines suggested. We have chosen a different strategy from the chapter, which is to synthesise the DM literature as much as possible. There is a little more pol sci decision material but not enough - will do more next time. The final suggestion sounds like original research ...

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
42	45557	2	0	0	0	0	This is a very useful chapter that sets the scene for the renewd focus on AR5 to provide a more integrative basis for the assessment leading to human development implications. The chaper is informative and deals with a number of complex issues with varying degree of precision. The discussion on risk and uncertainty in particular needs improvement. The current typology adopted on page 8, lines 19 to 30 are closely interlinked and provides no clear direction to help adaptation policy. Section 2.1 would benefit from the inclusion of the state-contingent approach to uncertainty, which is a clear ommision from the report. This method of analysis is a theoretically robust approach to incorporate uncertainty in production and choice. A renewed basis for the method is in Chambers and Quiggin (2000), Quiggin and Chambers (2006) and applications to climate adaptation are in Adamson, Mallawaarachchi and Quiggin (2007, 2009). A very useful primer on the method are in Rasmussen (2011). These examples may be used to supplement the discussion in section 2.2.1.4. (Thilak Mallawaarachchi, The University of Queensland)	We cannot explicitly describe the method which is more suited to Chapter 17, but can mention it as an application.
43	45569	2	0	0	0	0	References: Chambers, R.G. and Quiggin, J. (2000). Uncertainty, Production, Choice, and Agency: The State-Contingent Approach. Cambridge University Press, New York. Quiggin, J. and Chambers, R.G. (2006). The state-contingent approach to production under uncertainty, The Australian Journal of Agricultural and Resource Economics 50, 153-169. Available from URL: http://www.blackwell-synergy.com/doi/abs/10.1111/j.1467-8489.2006.00320.x Adamson, D., Mallawaarachchi, T. and Quiggin, J. (2007). Water use and salinity in the Murray-Darling Basin: A state-contingent model, The Australian Journal of Agricultural and Resource Economics 51, 263-281. Adamson, D., Mallawaarachchi, T. and Quiggin, J. (2009). Declining inflows and more frequent droughts in the Murray-Darling Basin: climate change, impacts and adaptation, Australian Journal of Agricultural and Resource Economics 53, 345-366. Available from URL: http://dx.doi.org/10.1111/j.1467-8489.2009.00451.x (Thilak Mallawaarachchi, The University of Queensland)	See above
44	46942	2	0	0	0	0	This chapter is a welcome addition to the assessment of WGII. However, Adger et al (Adger WN, Lorenzoni I and O'Brien KL (2009) Adapting to Climate Change: Thresholds, Values, Governance, Cambridge University Press, p6) accepts that there are plausible climate thresholds to which adaptation can barely respond, section 16.5 of this FOD makes a similar point. Thus for a chapter entitled 'Foundations for Decision-making' I think that this should be given high prominence. Indeed there is little consideration of impacts in broad terms at all in the chapter; instead broadly an assumption is made that impacts can be predicted regionally. In the light of Adger et al (2009) and Charlesworth M & Okereke C (2010, Policy responses to rapid climate change: An epistemological critique of dominant approaches, Global Environ. Change, 20:121-129, doi:10.1016/j.gloenvcha.2009.09.001) the emphasis on adaptation throughout the chapter is unwarranted. Thus discussion of impacts, in particular plausible catastrophic impacts should be given high prominence with specific consideration given to decision-making in the light of unimagined tipping points being crossed. The analysis of Charlesworth M & Okereke C (2010) is a good starting point for this. I have completed an unpublished book manuscript t+G13hat significantly extends this analysis and discusses the options in significantly more detail. (Mark Charlesworth, Keele University)	Need to consider in impacts section
45	46943	2	0	0	0	0	The tenor of the chapter is instrumental, utilitarian and predictive i.e. Baconian (cf. Charlesworth and Okereke, 2010) - much of the text should make its ethical and epistemological assumptions clearer and defend these assumption explicitly; this particularly applies to discussion of risk, decision processes and the aims of those processes. (Mark Charlesworth, Keele University)	Have somewhat remedied this, and we are trying not to be too Baconian!
46	47216	2	0	0	0	0	The term 'Scenarios' is used from several angles : emission scenarios, climate scenarios, adaptation scenarios, etc.. There is a need for clear definition and use. Clarifications would add cohesion in the whole document, references are often done to climate scenarios. (Diane Chaumont, Ouranos)	Check that this is done better
47	47460	2	0	0	0	0	This new chapter gives a very helpful overview on several aspects of decision-making in the context of climate change (CC). In particular I found the distinctions made along 'research for' vs. 'research on' decision-making, furthermore the normative vs. descriptive perspective useful, having some background on decision-theory myself (sort of from the social planner's perspective). Also I found the description of the related institutional requirements illuminating. However a general question that I have is whether some statements regarding 'tame' vs. 'wicked' problems could be made crisper. In what sense is then a stronger involvement of stakeholders necessary? What desirable properties from rational decision-making need to be sacrificed, such as time-consistency? Also, one could misread the chapter as if rational decision-theory does not allow for learning / updating under new information, while quite the contrary, expected utility theory can particularly well deal with the advent of new information. It preserves time-consistency, that is a key property for ensuring economic efficiency, particularly relevant for long-term investments. I guess what the authors want to say is, that for wicked problems, there is an increased need to co-generate norms if completely unexpected effects are observed, in an iterative manner. (Hermann Held, University of Hamburg)	Thanks. We have tried to make the relevant sections crisper and to get a better balance between different modes of decision-making.
48	47714	2	0	0	0	0	This chapter is a welcome and much needed addition. Nice work. (Eric Toman, The Ohio State University)	Thank you
49	47910	2	0	0	0	0	The chapter outlines some useful typologies, but doesn't always emphasize the opportunity and practical value of applying mixed approaches and criteria from across these typologies (such as 2.2.1.5 on process- and outcomes-based criteria). (Jenny Frankel-Reed, USAID)	Agreed - we have tried to make this discussion clearer and more ordered
50	47911	2	0	0	0	0	Framing is a key concept for understanding how a climate change 'problem' is defined and how the risks and tradeoffs are assessed and/or addressed. It comes up on p. 12, but could be presented more broadly earlier in this chapter to help structure a discussion of how decisions are made; for instance, how scenarios are developed and whether they resonate with stakeholders and decision-makers. (Jenny Frankel-Reed, USAID)	The structure of approach methdology and method along with some social science framing later in the chapter should help
51	47915	2	0	0	0	0	It is important to talk about participation and transparency for effective decision-making processes, and bring in evidence from the literature that civic participation in institutional processes can give those decisions legitimacy, accountability, sustainability, etc. (Jenny Frankel-Reed, USAID)	Yes, some work added but we will keep our eyes on this in further iterations

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52	48252	2	0	0	0	0	In chapter2 I find a general lack of cohesion between paragraphs, a lack of examples for a non specialist to undestand easily and very little mathematics for it being a risk -based topic (Malini Nair, Indian Institute of Science)	Noted, but we are staying away from mathematics
53	48253	2	0	0	0	0	The link between the diagrams in the appendix and the text has to be made more clear (Malini Nair, Indian Institute of Science)	We have endeavoured to do this and deleted less relevant figures
54	48254	2	0	0	0	0	in Chapter 2 the discussion of the theory with respect to climate change is especially lacking and an area of concern. This chapter has to be carefully rewritten including these ideas (Malini Nair, Indian Institute of Science)	No, this is a working group I issue and we take it at face value
55	48256	2	0	0	0	0	The write up about climate action plans have to be expanded (Malini Nair, Indian Institute of Science)	These are actually being reduced slightly due to space issues
56	48487	2	0	0	0	0	Chapter 2 often takes a very specific stance on objectivity and rationality (sometimes explicitly but more often implicitly). If I perceived it correctly, the stance roughly is (in overstated terms) that it is an outdated view to believe in objective and rational standards for science (at least for some parts of science, such as the social sciences?) and in particular for values. Chapter 2 understands values often not only to be contested but also as something subjective. This stance is surely not eccentric but it is not at all a consensually shared standard view. Rather, some people believe that rationality and objectivity are important goals, not only for science but even for values. The goals of rationality and objectivity should guide our reasoning and decision-making and they often successfully do so. In my view, the authors should make their stance on objectivity, values, etc. more explicit and make it clearer that many disagree with their view. Some places in chapter 2 where I sensed the mistrust of objectivity/rationality and where I sensed the association of values with subjectivity, cultural construction, etc. can be found on: Page 4, Line 11-14 Page 4, Line 41 Page 5, Line 16-20 (this passage was difficult to understand for a person with training in philosophy) Page 7, Line 54 Page 8, Line 33-34 Page 18, Line 24 Page 19, Line 11-12 Page 20, Line 34 Page 30, Line 41 (Dominic Roser, University of Zurich, University of Graz)	Our conclusion is that science shows values to be subjective in human decision-making, especially through experimental economics. We have tried to make the objective/subjective stance clearer especially through calculated and perceived risk
57	48488	2	0	0	0	0	According to my impression, chapter 2 often to brings together too many varied theories on too little space. In general I would have found it more helpful if in each section of the chapter three or four theories would have been clearly laid out and explained -- each theory in a whole paragraph (and then compared). This would have been more instructive, systematic, and clarifying than rapidly assembling a cascade of keywords from different authors and theoretical approaches. Two examples of this can be found in: Chapter 2, Page 8, Line 12 to Line 41 Chapter 2, Page 9, Line 12 to Line 52 (Dominic Roser, University of Zurich, University of Graz)	We have tried to make this clearer and also to bring those theoretical aspects together - not totally sucessfully yet but there has been progress
58	48489	2	0	0	0	0	The following is by far my most important comment for chapter 2. In my view, one topic was seriously underweighted: The Decision Criteria for Evaluating Tradeoffs. In other words: Section 2.2.1.5 starting on Page 11 could be much longer and much deeper (if that were to be done, section 2.2.3.4 could then be incorporated in section 2.2.1.5). Or in still other words: Of the five key elements mentioned on p. 6 (Line 39-47), the second element "Defining the objectives to be achieved" did not receive the attention that its relevance merits. In a chapter on foundations for decision-making I would have found it extremely important to have more guidance on criteria for how values ought to be traded off against each other. These values are: - Aggregate measures: cost effectiveness, efficiency, aggregate damages, etc. - Distributive justice: Distribution of costs across countries, generations, levels of wealth, gender, etc. - Risk: mean-vs-variance, precautionary principles, risk aversion, safety, etc. - Basic rights - Non-anthropocentric values - Etc. It matters extremely much for later chapters which of these values are deemed relevant for decision-making and in what way. Depending on which values are considered important and depending on how they can justifiably be traded off against each other, the emprical results in the later chapters must be interpreted accordingly. There has been a lot of systematic reflection in the literature on how these values ought to be conceptualised and how the trade-offs ought to be made (see, for example, the volume that appeared in 2010: "Climate Ethics: Essential Readings" (New York: Oxford University Press) co-edited by Stephen Gardiner, Simon Caney, Dale Jamieson and Henry Shue). Also, given that economic methods for trading off values are so prominent at various points in the report, I would have found it extremely important to spend a page or so on an evaluation of cost-benefit analysis. Cost-benefit analysis is a fascinating tool but it rests on premises that are not widely shared and therefore its strengths and weaknesses should be discussed. In particular, it should be pointed out on what presuppositions it rests. (Dominic Roser, University of Zurich, University of Graz)	This seems to be very useful advice; maybe a table or box could be created. We have improved the section on ethics and still have some way to go on combining ethics and economics but have made progress. The discussion on trade-offs has also been expanded but not yet to this level (getting a balance between depth and bredth is tricky with spcae limitations)
59	48501	2	0	0	0	0	Generally, I would like to remark that there is a large and very helpful philosophical literature on good decision-making (on climate ethics generally, see for example the 2010-collection "Climate Ethics: Essential Readings" (New York: Oxford University Press) co-edited by Stephen Gardiner, Simon Caney, Dale Jamieson and Henry Shue. See also the further work by each of the editors of this collection. For the philosophy of risk, see for example the work by Sven Ove Hansson and his former students). At many places in chapter 2, this literature could have provided much needed clarification. In a chapter that declares that it deals with the "philosophical foundations of decision-making", it would have been very useful to have a philosopher familiar with this literature in the writing team. (Dominic Roser, University of Zurich, University of Graz)	Author (RJ) is familiar with Hansson's work and has moved to incorporate it. The relevant section (2.1.2) has been tightened.
60	48720	2	0	0	0	0	The authors should define “decision” somewhere. This would clarify some aspects of the chapter I found confusing, e.g., the equation of risk assessment with decision-making. A definition presented in the structured decision-making class at the US Fish and Wildlife Service's National Conservation Training Center was "Choosing one action among alternatives; more than a preference, its actually deciding what to do, e.g. a commitment of resources." (Jennifer Hoffman, EcoAdapt)	Ducked out of a definition but did modify the discussion to balance this

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61	48721	2	0	0	0	0	The chapter makes frequent use of the terms “wicked problem” and “tame problem.” These should be more clearly defined at the start. Also, I find the presentation of this as a dichotomy rather than a continuum to be problematic. I would prefer the more nuanced approach of presenting simple vs. complicated vs. complex vs. chaotic problems. Furthermore, there is a tendency to highlight the wickedness of climate-related decisions in a way that makes it sound unique, when in fact there are plenty of other wicked problems in the world. Also, not all decisions related to climate change adaptation are wicked problems. A related concern: the text sometimes gives the impression that the uncertainty and need for iterative decision-making associated with climate change-related decisions are somehow different from anything people have faced before. This is not in fact true. The field of adaptive management and other iterative decision-making processes were developed well before climate change adaptation came along, and people deal with a wide range of decisions that have deep uncertainty and require an iterative approach. Indeed, much of the uncertainty associated with climate change is in fact smaller than the uncertainty associated with issues like the possibility of a global economic melt-down, the reshifting of national boundaries by negotiation or violent conflict, regime change, etc. (Jennifer Hoffman, EcoAdapt)	We have added the continuum, which was implicit and tightened the explanations. We would still argue that adaptative management as a deliberative process is not that widely applied but that parts of the process, are, in many guises.
62	48748	2	0	0	0	0	Very worthwhile adding a chapter with this focus. It would be useful to consider the likely audience for this chapter in contrast to the audience for other chapters. Many readers who are decision-makers will find it heavy going with too much attention to theories and models of decision-making and too little given to useful examples of what works. Many will read this chapter but no others. It will be a touchstone for the new approach in AR5 .... worth giving extra attention to making it readable. A sharper distinction might be drawn between decision-making for adaptation, which is local, and cutting greenhouse gases, which is national and multi-national. One very marked practical distinction between the two which could well be given more emphasis is the difference in public participation. At the local level much participation needs to be action oriented, while at the national level it is policy oriented. The need for public engagement and dialogue in decision making is mentioned but should be given much more attention. The Danish Board of Trade has held consensus (citizen or deliberative) conferences as part of policy making in science-society areas since the 1980s. Others in Europe and farther afield (e.g. New Zealand) have also used this approach. The European Union has recently implemented it as well. It has been more widely used in the health sciences than climate change and there is a need to learn from that experience. As it stands the impression from the chapter is that decision-making is more top down than a process that must engage the public. There is a danger that it will be seen as out-of-date and not forward looking toward new decision making for a new generation – most of whom get their news from the internet. Agency is mentioned and could be given more attention. I suggest there be a little more discussion of the purpose and implications of framing. Boykoff and Timmons (2007) include a reasonable definition. The difference between the public perception of “changing climate” – which can be seen in personal and family experience and is reflected in everyday stories – and “climate change” which is seen by the public as a geeky, computer-based theory, should be remembered in this chapter. More use could be made of the former. (David Pearson, Laurentian University)	I am not familiar with consensus conferences, but maybe there is an opportunity to include a brief review of tools of public engagement (focus groups, brainstorming, etc.), and connect this with Figure 2.7 and discussion on language and framing in section 2.2.3/2.3.7?
63	48749	2	0	0	0	0	Risk perception by the public includes what Peter Sandman has called an “outrage” factor – best thought of as a feeling of vulnerability. Consideration of the public’s perception of risk is very important in decision-making processes that engage the public. Could be given more attention as part of considering the design of public engagement in changing climate policy and adaptation. It seems to me more attention could be given to adaptation planning process and examples. The value of organizations like UKCIP should be included when considering decision-support and climate services. A “Summary for Communicators” would be a useful counterpart to the “Summary for Policy-Makers” Consideration of how best to use the internet to connect AR5 with decision-makers and the public would be worthwhile if it has not already been undertaken. Rowe, G. and Frewer, L.J. (2000). Public Participation Methods: A Framework for Evaluation. Science, Technology, & Human Values:25(1),3-29. The Danish Board of Technology. (2006). The Consensus Conference. URL: www.tekno.dk/subpage.php3?article=468&toppic=kategori12&language=uk Laurie Boussaguet and Renaud Dehouss (2008) Lay people’s Europe: A Critical Assessment of the First EU Citizens’ Conferences. European Governance Papers ISSN 1813-6826 http://www.connex-network.org/eurogov/ Boykoff M.T. and Roberts J.T. (2008) Fighting climate change: Human solidarity in a divided world. U.N.D.P. Human Development Report Office. Media Coverage of Climate Change: Current Trends, Strengths, Weaknesses (David Pearson, Laurentian University)	The summary for communicators is a larger project than this chapter, and we refrain from any editorial content about the IPCC being able to manage that process. We do refer to boundary organiztions, which UKCIP is, and would consider changing the emphasis on these in future.
64	48881	2	0	0	0	0	Excellent contribution to this suite of chapters (Leon Soste, Department of Primary Industries, Victoria, Australia)	Thanks Leon
65	49428	2	0	0	0	0	Since this chapter attempts to support decision-making on climate change impacts, adaptation, and vulnerability assessment (CCIAV), the analysis can be strengthened by clarifying and/or expanding some of the following questions/ideas/discussion. For example, how decision-making can be improved to obtain the best combination of mitigation and adaptation strategies (Fabiola S. Sosa-Rodriguez, University of Waterloo)	There is a section on this
66	49430	2	0	0	0	0	How the political factor can influence decision-making on CCIAV—in addition to the socio-cultural and cognitive/psychological factors (Fabiola S. Sosa-Rodriguez, University of Waterloo)	We admit to being a bit thin here, have added some brief material, but will continue to consider how to improve our approach on collective decision-making
67	49431	2	0	0	0	0	How methods used for risk management under a changing climate differ in terms of decision-making, and what are the advantages, disadvantages and challenges of using these methods on CCIAV (Fabiola S. Sosa-Rodriguez, University of Waterloo)	This is somehwat covered in Carter 2007 and we are endeavouring to expand here.
68	49432	2	0	0	0	0	What a ‘good decision’ means in terms of CCIAV (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Have changed this to better decisions in response to comments and the literature

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
69	49437	2	0	0	0	0	Incorporate the discussion of the cultural theory of risks to explain how values and social context determine the perception, assessment, and acceptance of climate-related risks (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Have tried to improve this area
70	49442	2	0	0	0	0	Define the concept of 'decision-making' as complex system and explain what this means in terms of climate change (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Have tried to improve this area
71	49443	2	0	0	0	0	Discuss the role of information in decision-making on CCIAV (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Have tried to integrate this with the other material - to be honest, we think that how information is used within a social context is most important. Have referred to "info-gap" models etc
72	49444	2	0	0	0	0	Explain how scenarios and scientific/technical knowledge can be translated into effective actions (Fabiola S. Sosa-Rodriguez, University of Waterloo)	We are aiming to do this but not in an applied manner - this is a Chapter 30 role, we feel
73	49874	2	0	0	0	0	There are overlaps between this chapter and the guidance document on methods of VIA assessment being prepared for PROVIA and recently out for review (I hope some of you managed to look at it!). I think there are good opportunities for us to learn from each other, because we are working largely with the same material! (Timothy Carter, Finnish Environment Institute)	The Provia material is over-engineered and too technical - a major critique of our chapter - we don't want to be too critical of the Provia material while it is in draft
74	49955	2	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. In an effort to inform further chapter development, I provide some general and specific comments below. (Katharine Mach, IPCC WGII TSU)	Thanks we have tried to do that
75	49956	2	0	0	0	0	2) Highlighting key findings -- In developing the 2nd-order draft, the author team should aim to present key findings throughout the sections of the chapter, using calibrated uncertainty language to characterize its degree of certainty in these conclusions. Assignment of summary terms for evidence and agreement and levels of confidence may be particularly appropriate. By highlighting findings 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 further enhance their presentation, with meaningful specificity and nuance, in the context of the executive summary. (Katharine Mach, IPCC WGII TSU)	Improved, but still a work in progress
76	49957	2	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)	The uncertainty material is not well enough framed more much of what we are doing - it is predictive and we are not
77	49958	2	0	0	0	0	4) Plenary Approved Outline -- The author team may wish to consider and perhaps increase the visibility of topics on the PAO in the chapter outline. Although all topics are addressed within the text of the chapter, it could be beneficial to highlight this treatment further through the titles of sections and subsections of the chapter. (Katharine Mach, IPCC WGII TSU)	Have endeavoured to do so
78	49959	2	0	0	0	0	5) Regional balance of examples -- The regional balance of examples used is significantly improved, but such balance still could be an area for further improvement in the chapter team's development of the 2nd-order draft. (Katharine Mach, IPCC WGII TSU)	But we have to cut significantly and many of these have gone - have still tried to maintain balance, though
79	49960	2	0	0	0	0	6) 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)	Took part in meetings and conversations with the other cross-cutting chapters
80	49961	2	0	0	0	0	7) 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)	Yes, but Working Group I does not understand risk
81	52142	2	0	0	0	0	"Rational science-driven models have been utilized intelligently for decision making leaving less room for speculative factors, thereby arriving at good decisions" (Shelley Bhattacharya, Visva Bharati University)	We view this statement as being highly conditional on context and have tried to make that clear in the chapter
82	52441	2	0	0	0	0	I applaud the inclusion of a decision support chapter in AR5. This is indeed an important topic given the chronic nature of climate change, the sometimes high uncertainties, and the need to make decisions despite such uncertainties. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Thank you
83	52442	2	0	0	0	0	I particularly like the focus on the decision process over a sole discussion of the decision tools. Often times there is an well-intentioned, but poorly conceived focus on the tools as if more or different presentation of the scientific information will improve decision-making. Though this may be the case in some situations, as the authors note these tools cannot prescribe "the answer" nor can they be useful in all situations. By focusing on decision process best practices a decision maker can make sure that they are effectively including scientific information, assuring that they are not hiding behind statements of uncertainty when there is no value of information to higher precision, and transparently separating the scientifically assessed consequences of various actions from an individual's or group's values. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	We have tried to improve this aspect of the chapter in this draft

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
84	52443	2	0	0	0	0	In general, I approve of the iterative risk-based framing, as it supports the conclusions from America's Climate Choices and other reports, however the risk framing emphasizes reducing negative consequences given one's risk tolerance and is not always as good at providing options to take advantage of opportunities resulting from a changing climate. Granted, the net result globally is negative, however because there will be some locations or sectors that will have positive outcomes for certain objectives, it is important that such a framework also have the flexibility to help one consider taking advantage of opportunities. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	We have tried to be clearer on the point that risk goes both ways so includes "chance" and "opportunity"
85	52749	2	0	0	0	0	I wonder whether the concept of maladaptation should be introduced more prominently given its significance in later chapters (from those that I have had chance to read). (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Yes, need to get something in here
86	52750	2	0	0	0	0	The reference to the concept of reflexivity/ reflexiveness is to be welcomed, but it could be more explicitly defined. By no means every reader will be familiar with the sociological literature from which it originates. Currently its implications are only really elaborated with regards reflexive scenarios - what about other methods? (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Have expanded the use of process later on (3.4.1)
87	52942	2	0	0	0	0	The chapter covers a range of very interesting and useful topics. However, these need better integration across the chapter. Many sections are lists of components or aspects of a topic, without any indication of whether the categorizations are useful and, if so, how. It would be helpful to readers to have a sense of the value of various framings and approaches. (Kristie L. Ebi, IPCC WGII TSU)	Have made some progress in this area, and will look to improve in future
88	52943	2	0	0	0	0	Thank you for putting in markers to other chapters; now is a good time to identify which sections in other chapters are relevant. (Kristie L. Ebi, IPCC WGII TSU)	Will do
89	54396	2	0	0	0	0	GENERAL COMMENTS: I would like to thank the authors for a very interesting and enjoyable FOD. Various general and specific comments follow. 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) Cross-chapter coordination is also important at this stage, as it should now be possible to identify topics that overlap with other chapters and to coordinate with other chapter teams to minimize that overlap. One cross-chapter coordination item I would like to highlight is the box on RCPs and SSPs in 2.2.1.6. Several other chapters are developing boxes or other text on the Representative Concentration Pathways and the Shared Socioeconomic Pathways. These include Chapter 1, Chapter 19, Chapter 20, and Chapter 21 (as you note). It would be very useful to coordinate with them regarding descriptions of these pathways. (4) Cross-Working Group coordination is important as well, and relevant chapter sections should cross-reference chapters from the other Working Groups, particularly in the case of statements about changes in mean or extreme climate conditions that are assessed in the contribution of Working Group I. (Michael Mastrandrea, IPCC WGII TSU)	We have paid most attention to distilling the chapter text and on fleshing out sections in order to tighten the chapter narrative. Cross chapter links have been improved somewhat but can be improved further.
90	54397	2	0	0	0	0	EXECUTIVE SUMMARY: Thank you 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 (a draft of which you already have provided) to supporting chapter sections where the traceable account appears. There are a variety of statements in the chapter text that employ calibrated uncertainty language and could provide fodder for findings in the Executive Summary. In addition, please see my separate comment on traceable accounts. (Michael Mastrandrea, IPCC WGII TSU)	Noted and actioned
91	54398	2	0	0	0	0	TRACEABLE ACCOUNTS: The author team has made a good start to providing traceable accounts for the Executive Summary bullets. There are several cases where improvements could be made, for which I have included suggestions in comments associated with specific bullets. In general, I would recommend the author team consider ways to more clearly identify assessment findings in the chapter text to link with the Executive Summary. One approach would be providing some explanation of 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 (and/or evidence and/or agreement is not robust and/or high), it would be useful to understand why the author team has made this judgment (e.g., why is confidence not high, evidence not robust, and/or agreement not high). 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. Finally, several of the current bullets in the Executive Summary share text with section 2.3.7, while this section is not currently included in any of the line of sight indicators. This may be a location for adding some of the traceable account information for findings that synthesize across other chapter sections, including introduction of calibrated uncertainty language. (Michael Mastrandrea, IPCC WGII TSU)	Worked on throughout the chapter
92	54685	2	0	0	0	0	The chapter team may consider increasing the discussion on the risk management framework, in particular on the issue of translating from different types (and nature) of evidence and the collection of information on specific topics (e.g. water) and ways of integrating such information in relevant sectors. (Monalisa Chatterjee, IPCC WGII TSU)	The new structure of the chapter hopefully makes this clearer but there is still a way to go
93	54686	2	0	0	0	0	The figures provided in the chapter are useful but not integrated in the discussion provided in the chapter. The author team may consider expanding to explain the different components of a figure and its relevance in the current discusssion. (Monalisa Chatterjee, IPCC WGII TSU)	Figures have been deleted and modified to achieve this

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
94	54694	2	0	0	0	0	The author team should update the reference list and remove citation inconsistencies between in text citations and full citations given in the reference list. Please see supplementary document named WG2AR5-Chap2_Reference Checks.pdf at https://ipcc-wg2.gov/AR5/author/FOD/SuppMat (Monalisa Chatterjee, IPCC WGII TSU)	Noted
96	39478	2	1	23	0	0	Careful - this line looks like you might be proposing irrationality! More generally, this first bullet point needs to be crafted with exquisite precision and it's not there yet. Elements that must remain are the novelty, so the opening sentence is great! It 'brings new material into the IPCC assessments' - but take care with next phrase - the IPCC is *not* doing or prescribing decision-making, as this sentence implies. What has broadened are the research insights and experience base available to inform decision-making. A more concise phrasing of the last two sentences might also be useful. Suggest: ' Previous assessments have focused on filling scientific knowledge gaps, on the basis that better scientific understanding contributes to better decision-making. Science is necessary but not sufficient, especially in complex situations with substantial uncertainty, and particularly those where society's priorities and values are contested. A growing body of research is now available to inform about the process of decision-making under such conditions, both supporting and critically reflecting upon good practice.' (Sarah Cornell, Stockholm Resilience Centre)	The IPCC has produced guidance material that does do that - it is not in the assessments but in technical material. The sentence has been reworded as has the rest of the bullet point.
97	39479	2	1	26	0	0	Careful too in using 'tame' and 'wicked' and 'linear' in the exec summary - no space for explanation, and the terms can be ambiguous to non-native English speakers. Instead of linear methods suggest 'standard processes for scientific evidence provision'. It would also be good to put tame and wicked in quotation marks, at least on first usage in main body text, so that it is clear that these are shorthand/heuristic terms rather than formally researched social concepts (although they are on their way to that!) (Sarah Cornell, Stockholm Resilience Centre)	This language is further down and better explained
98	39480	2	1	30	0	0	Ensure these risk discussions are coherent with definitions in chapter 1… Perhaps rather than talking about 'modern' risk framings, emphasise that the recent increase in transdisciplinary treatments of risk is resulting in a new understanding of the social and behavioural aspects that have been omitted in the past and that cannot be addressed solely by scientific/technical assessments. (Sarah Cornell, Stockholm Resilience Centre)	Yes, we've done our best with this and have coordinated definitions at the glossary level.
99	39481	2	1	50	0	0	Invert the order of the two sentences in this bullet point - start with the general, then focus on the specific. Also (and throughout this chapter) take care with the usage 'has to'… - worlds can be imagined where knowledge transfer does not take cultural diversity etc into account at all. 'Knowledge transfer is a dialogic process. For effectiveness and legitimacy, KT requires taking cultural values into account…' (Sarah Cornell, Stockholm Resilience Centre)	Have changed the wording
100	39482	2	2	1	2	3	Translation introduces uncertainties to the decision-making process in addition to the scientific uncertainties about climate processes and changes. Importantly, this also presents ... ' (Sarah Cornell, Stockholm Resilience Centre)	Text changed and wording removed
101	39483	2	2	4	0	0	Make a separate bullet for insitutional implications using this line and and also page 47 line 38 - at the moment, this key (and well researched) aspect is (or looks like) an after-thought line in this bullet and the earlier one. (Sarah Cornell, Stockholm Resilience Centre)	Noted - institutions made more prominent but not in this location
102	49962	2	2	19	0	0	Executive Summary -- In subsequent work on the executive summary, there are several aspects of development for the author team to consider further: 1st, it would be preferable to present the paragraphs of the executive summary with a key finding in bold text followed by explanatory non-bold text. For both key findings and explanatory text, clear line-of-sight references should be provided to the supporting chapter sections, as already done throughout. 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, especially considering summary terms for evidence and agreement and levels of confidence. If the chapter team has any questions about application of the uncertainties guidance for authors, please do not hesitate to contact the TSU (especially Mike Mastrandrea). 3rd, as much as possible, the author team may wish to enhance specificity, providing further detail in support of findings (when, where, why, what key examples, what specific drivers, what determinants), in this way illustrating with nuance where the current state of understanding lies. (Katharine Mach, IPCC WGII TSU)	noted and actioned
103	49022	2	2	19	3	8	Please consider to include more of the most important findings in the executive summary of this chapter. Such as "That decision processes are at least as important as good information in promoting effective decisions [high confidence]" (Cut from page 5 line 53-54) and "A broad conceptualization of values is needed to understand and respond to climate change. In this broader conceptualization, values are understood as the subjective, qualitative and intangible dimensions of climate change and its impacts that are of importance to individuals and cultures. Drawing on such a broad frame, values may concern the effects of climate change on, for example, place identity, land-based or traditional practices important for cultures, and the symbolic meanings of places and practices in particular where irreversible losses are likely." (cut and rephrased slightly from page 18 line 22-28). (Oyvind Christophersen, Climate and Pollution Agency)	We haven't done this but will liais more with Ch 17 and consider for next round
104	52944	2	2	19	3	8	Please format the Executive Summary in the approved style, including uncertainty language to describe your certainty in key findings. There are several places in the text where key findings are stated; not all of these appear in the Executive Summary. (Kristie L. Ebi, IPCC WGII TSU)	noted and actioned
105	49021	2	2	19	3	8	The executive summary of chapter 2 should be more in line with what is current practise in previous IPCC reports and the other chapters. It should more clearly present the major findings/results from the underlying sections of the chapter. (Oyvind Christophersen, Climate and Pollution Agency)	noted and actioned
106	49023	2	2	21	2	21	This is a new chapter compared to previous IPCC assessments. Similar material has been included in previous assessments. The reason for adding a new chapter on decision makins is: (bullet list) (Oyvind Christophersen, Climate and Pollution Agency)	We were not provided with the decision-making process of the IPCC membership and scoping process, so cannot provide this information.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
107	40697	2	2	21	2	24	The term "information-gap model" bears the potential of being confused with "information-gap decision theory" (Ben Haim, Y., 2001) that is also cited in the chapter. I would suggest to erase the term "information gap model" in favor of directly using the verbal explanation that is already provided one sentence later: "These assessments have operated under the assumption that better science will lead to better decisions." (Florian Hartig, Helmholtz-Centre for Environmental Research - UFZ)	Done
108	49813	2	2	21	2	25	The models simply do n ot work. No model has ever successfully predicted future climate. Weather foreecasters already have the best available methods. Your models should be ignored. (Vincent Gray, Climate Consultant)	This is a working group I issue - and in any case weather forecasting is an initial conditions problem and climate forecasting a boundary problem so they cannot be assessed using the same criteria
109	48248	2	2	21	3	8	Executive summary has to read as a paragraph and should be consistent across chapters (Malini Nair, Indian Institute of Science)	Not sure what this comment means, but we do try for consistent style
110	49814	2	2	21	36	49	Decisions should be based on evidence. Since there is no evidence that greenhouse gases are harming the climate their influence should be ignored. (Vincent Gray, Climate Consultant)	This comment is not relevant to our chapter scope.
111	48250	2	2	28	2	28	"Wicked" problems either needs proper probabilistic definition or needs rephrasing (Malini Nair, Indian Institute of Science)	No - by definition (deep uncertainty, poor boundaries), this is fundamentally impossible - if you can put numbers on it, it is not a wicked problem.
112	46944	2	2	28	2	29	Charlesworth M & Okereke C (2010) offers four other relevant alternatives that appear not to have been considered. (Mark Charlesworth, Keele University)	This is a really important viewpoint that we haven't got into the chapter yet. We can't do a social critique on climate science here but we can embed these the proposed strategies into the chapter.
113	48723	2	2	30	0	0	The authors equate risk assessments with decisions, but I see them asquite distinct. You could easily do a risk assessment without making a decision. A better approach would be to say that decisions involving valued outcomes and uncertainty include a risk assessment, either formal or informal. (Jennifer Hoffman, EcoAdapt)	This is a neat point - it is implicit in the chapter but needs to be drawn out and highlighted.
114	54149	2	2	30	2	35	Regarding the traceable account for this bullet, the main support appears to be in section 2.2.1.3, so both this section and 2.2.1.2 should be cited. Also, similar text appears in 2.3.7, which could be a location to add further introduction of the finding and associated calibrated uncertainty language. (Michael Mastrandrea, IPCC WGII TSU)	Traceable account provided and chaper reorganised
115	43851	2	2	30	2	35	This is not easily read and is difficult to distill meaning and understanding. It may be useful at this point to also indicate that you disregard the Knightian distinction between risk and uncertainty and why a broader conceptualisation of risk is needed for informing discussion and decisions in adaptation. This will help readers understand why you provide the definitions for risk that you do (as these are not immediately or intuitively helpful from a decision makers perspective) (Russell Wise, CSIRO)	Cannot do the Knightian distinction up here but it is in the chapter and the use of definitions clearer.
116	49024	2	2	32	2	32	very broad, for example: risk is .... (Oyvind Christophersen, Climate and Pollution Agency)	reworded
117	49025	2	2	32	2	37	Avoid to use name of methods without explanation e.g. "refexive methods" (Oyvind Christophersen, Climate and Pollution Agency)	Done. And also defined in the chapter - we also submitted to the glossary
118	38236	2	2	33	2	35	Executive Summary. “Two very important aspects of risk are calculated risk and perceived risk. Both need to be managed and understood in effective decision making processes aiming to manage climate-related risks.” It may be helpful to distinguish between these two important aspects of risk. That is, it may be useful to differentiate between “calculated risk” and “perceived risk” in this Executive Summary, so as to better manage climate-related risks. (Abdalah Mokssit, Direction de la Météorologie Nationale (DMN))	Yes, we have done that
119	54150	2	2	36	2	38	Regarding the traceable account for this bullet, section 2.3.1.2 also appears relevant. In addition, similar text appears in 2.3.7, which could be a location to add further introduction of the finding and associated calibrated uncertainty language. (Michael Mastrandrea, IPCC WGII TSU)	Reformat of chapter, but has been located in two places.
120	47461	2	2	37	2	37	The terminus 'reflexive methods' might ot be accessible to most readers w/o further explanations. (Hermann Held, University of Hamburg)	see comment 116
121	43852	2	2	38	2	38	It is not "institutions" that manage the process. "Institutions" cannot actively do the management. It is people and organisations that do the managing within prevailing institutions. (Russell Wise, CSIRO)	Have changed the language to reflect this - thanks
122	54151	2	2	39	2	44	Regarding the traceable account for this bullet, sections 2.2.1.5 and 2.2.1.6 also appear relevant. In addition, similar text appears in 2.3.7, which could be a location to add further introduction of the finding and associated calibrated uncertainty language. (Michael Mastrandrea, IPCC WGII TSU)	This point has been cut for several more specific points
123	43853	2	2	44	2	44	the term "decision risk" is introduced here. What is this? What does this mean? How is it different from the other types of risk that are characterised such as 'caclutated risk', 'risk governance', 'subjective risk', etc... (Russell Wise, CSIRO)	This point has been cut but is covered in points 3 and 5
124	43854	2	2	45	2	49	Decision support is so much more than "organised efforts to provide, disseminate and encourage the use of information...". Decision support is also organised efforts to desseminate and encourage the use of tools and processes for communicating, consulting, engaging, and deliberating. (Russell Wise, CSIRO)	Have beefed this point up
125	54152	2	2	45	2	49	Regarding the traceable account for this bullet, similar text appears in 2.3.7, which could be a location to add further introduction of the finding and associated calibrated uncertainty language. (Michael Mastrandrea, IPCC WGII TSU)	Negated due to reformat

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
126	47715	2	2	45	2	53	This description of decision support reads as a very linear and one-way process (information is produced by scientists who communicate it to decision-makers). I suggest broadening to include a description of the potential for two way interactions between users and producers of scientific information that enable users to influence the focus of scientific research. See for example, NRC. 2009b. Informing Decisions in a Changing Climate. National Research Council, National Academy Press, Washington, DC. For example, the NRC report argues that decision support is moving beyond the traditional view of information production and provision to one that integrates interactions between users and producers to create decision relevant research. "In this view, decision support consists of a set of processes intended to create the conditions for the production of decision-relevant information and for its appropriate use. Ongoing communication between the producers and users of information is at the center of these processes, and information products are one result, but not the exclusive one." (NRC 2009, p. 34). Similarly, climate services is about more than making information accessible, but also includes working with decision-makers to incorporate their information needs in the development of research questions to increase the likelihood of developing decision relevant information. The interactive nature of decision support is described throughout the chapter, but could be better clarified in the executive summary. (Eric Toman, The Ohio State University)	Not intended. Text has been clarified here and is certainly present within the body of the chapter.
127	45676	2	2	46	2	46	...to provide, disseminate, encourage and facilitate the use of information... (Roger Street, UK Climate Impacts Programme)	Done, within the context of the new edit
128	48050	2	2	50	2	50	Also locally accessible (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	We have implied this through appropriate context
129	43855	2	2	50	2	50	The concept "Climate Services" is introduced here. What are these? One immediately thinks of Ecosystem Services? (Russell Wise, CSIRO)	There is a whole section in the chapter and this is a new instiution developed through the WMO
95	45677	2	2	50	2	53	Would prefer that climate services is based on engagement (more than consultation, feedback or linked) - the result of informed engagement that allows for consideration of information supply... In addition, knowledge exchange rather than just knowledge transfer. Taking alternative forms of decision framing and knowledge into account. (Roger Street, UK Climate Impacts Programme)	It does say this - have removed dialogic and made this explicit
130	54153	2	2	50	2	53	Regarding the traceable account for this bullet, similar text appears in 2.3.7, which could be a location to add further introduction of the finding and associated calibrated uncertainty language. (Michael Mastrandrea, IPCC WGII TSU)	Done, within the new format
131	48724	2	2	51	3	5	Using terms like "knowledge transfer" and "translation" often imply a one-way flow of information that is often interpreted to support the old “better info means better decisions” viewpoint that the authors of this chapter rightly critique. It would be good to bring in some of the alternate terms or approaches such as co-generation of knowledge, the bridge model of information movement (as opposed to the one-way knowledge transfer or dumptruck approach). (Jennifer Hoffman, EcoAdapt)	See comment 129
132	36913	2	2	52	3	3	There scientific evidence displayed here for all of Europe is not justified. In fact, there are only some regions in Europe that might experience increased heavy precipitation. Heat waves are likey to increase in some regions, but there are no such signals on drought (despite hypothetical). The regional variation might also be highlighteds first. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
133	36912	2	2	52	5	16	The use of the word "will" in each header and in many parts of the paragraphs is questionable as we cannot forsee the future. The terms "potentially" is more correct. It would also be more approriate to start these paragraphs with the confidence and evidence, e.g. page 3, line 3 "There is medium confidence and evidence that climate change might decrease hydrowoer production...", instead of "will"... (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
134	42880	2	3	0	0	0	2.1: Concerning the Key Concepts, the Figure 2-1 and its explanation seems not enough and not easy to understand. Please consider to add the following reference: Fig. 22, page 43 of Committee on Climate Change Impacts and Adaptation Research, 2008: Wise Adaptation to Climate Change - Report by the Committee on Climate Change Impacts and Adaptation Research -, The Ministry of the Environment, Japan, 70pp. (Mariko Fujimori, Pacific Consultants Co., Ltd.)	Figure 2-1 has been removed as the chapter has now a different structure
135	52444	2	3	0	0	0	Figure 2.1: The end statement of the caption is confusing as I cannot see a clear connection to the figure. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Figure 2-1 has been removed as the chapter has now a different structure
136	47462	2	3	0	3	0	Somewhere in the middle of that page the concept of 'time-consistency' should be introduced - just to clarify that generically there is a price to be paid when going away from EU-frameworks. (Hermann Held, University of Hamburg)	Unsure about this comment - EU Frameworks have not been mentioned
137	43856	2	3	1	3	1	The concepts "vulnerability" and "risk" are suddenly used together but no definitions or clear indication of their differences are provided? Are these used interchangeably? (Russell Wise, CSIRO)	No, they are not. This point has been edited and they are defined in the glossary
138	54154	2	3	1	3	5	Regarding the traceable account for this bullet, boundary organizations are mentioned explicitly in section 2.3.1.3, which may provide better support for the last sentence here. (Michael Mastrandrea, IPCC WGII TSU)	Now in 3.1.3
139	45678	2	3	1	3	5	With respect to uncertainties, could the same not also be said for the other drivers of change for which scenarios are (or should be) used (e.g., socio-economic scenarios). It also presents an opportunity to better inform decisions. (Roger Street, UK Climate Impacts Programme)	We are referring to all scenarios here, not climate scenarios
140	49429	2	3	2	3	2	Clarify what you mean by ‘translations’ (Fabiola S. Sosa-Rodriguez, University of Waterloo)	I don't think we need to do that here - it seems quite clear
141	43857	2	3	4	3	4	What do you mean by "…it presents an opportunity to communcate climate changes in terms of [changes in risk] and effectiveness of adaptation responses"? This makes sense for "changes in risk" but not for "effectiveness of adaptation responses". (Russell Wise, CSIRO)	Point edited but it does matter - if how the climate changes is not understood adaptation may not be effective
142	48051	2	3	6	3	8	Should also include wider sustainability objectives (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Point edited to do this
143	54155	2	3	6	3	8	The traceable account for this finding in section 2.4.1 needs improvement. Currently, this section does not provide clear support. (Michael Mastrandrea, IPCC WGII TSU)	Section improved
144	47716	2	3	6	3	9	This statement about adaptation - mitigation trade-offs is unclear. (Eric Toman, The Ohio State University)	We have removed this conclusion

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
145	36914	2	3	11	3	18	The increase in river floods seems to be based on a potential increase in heavy precipitation. It would be more accurate to place the obserevd increase in damages first in this paragraph and potential climate change impacts later. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
146	46682	2	3	13	0	0	Section 2.1: This section identifies the foundations of decision-making where it indicates three aspects only: 'concern the decision itself', the 'decision-maker' and the 'type of decision' they make. However, the sentence misses a key foundation which is the "process of decision making". It is recommended that the revised sentences should be written mentioning of "decision making processes" that is often critical for reaching decisions. Decision making processes are particularly important for taking a more concerted and well agreed decision for climate change adaptation which requires high level of demcretaziation on many aspects. The decision making process is also important for incresingly transparent climate change screening and decision making in various contested contex. . ts. The mentioning of decision making processes are there in the section 2.2 which should have a smooth flow from this section as well. (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	We have made this point a key aspect of Section 2.1.1
147	44163	2	3	13	3	14	The authors should provide literature sources for the CCIAV concept. These could be based on the chapter 2.2.1 of the AR4. (Anne Holsten, Potsdam Institute for Climate Impact Research)	Done
148	45679	2	3	14	3	14	...Decisions under CCIAV aim to yield and enhance benefits and... (Roger Street, UK Climate Impacts Programme)	Sentence has been removed
149	39139	2	3	16	3	18	You mention diverging philosophical views about decision making but you do not take this injunction seriously, because: You have already adopted a decision making model of human behaviour. This model is basically 1980s cognitive psychology, and to me as a social scientist that appears like alchemy would to a modern chemist... The whole notion of decision making is contrary to science and has a semi-religious flavour. It adds nothing to the debate. The notion of "decision-making" carries with it the western (and essentially Christian) metaphysical assumption of there being a separate transcendental subject sitting in rational judgement over a variety of courses of action. There is no evidence for the existance of such separate subjects whatsoever, and hence in philosophy determinism occupies a far stronger position than liberal choice theories (determinism does need to provide an account of the role of consciousness, however, and admittedly some versions have trouble in doing so). Determinism suggests that people, like all things, act precisely in accordance with their intrinsic nature. Decisions are simply an illusion - there is only cause and effect when it comes to the human nervous system, and hence to speak of "decision makers" is a mere reification of a process (btw, randomness or chance does not help rational choice "liberal" philosophies either because accidents are not choices). There is mounting evidence from neurophysiology in support of this theory. The intelligent neurological processes that lead to what we call a decision are largely unconscious, though not at all random. This raises the question - how can we create the future we want? In my opinion, it is a matter of raising awareness of what is needed in this contemporary world through education, and by all means, this should include education about risks and probabilities. But beyond education, it is about whether people will take life-affirming mitigation actions, the need for which is already self-evident to a well informed person. Why is that not enough (and evidently it isn't)? Why will it not work simply to present more information? What you do not seem to understand is that people do not even necessarily want to live at all, because they have no idea how to live well (e.g. >40% of the US population suffers from depression). Further, even if they have a life-affirming outlook that outlook may be based on a poor understanding of what a good life is, and hence their actions may not be life-affirming beyond the immediate context wherein pleasure is sought and pain avoided. This fundamental criticism of the approach you have adopted is not some kind of joke: The rational choice model of human behavior you have adopted is sure to fail you because it is not science, it is the bureaucratic rationality of policy talk posing as science! I recommend you make more of your idea of using story lines and scenarios, which more closely fit with the way the human mind works. Or, we can talk about what really needs to happen to ensure that human actions in response to the facts of climate science will be life-affirming in a long-term, holistic sense. Too hard? Maybe next time?? How are you going to make your decision??? (btw, don't blame me -- as you say, its a wicked problem, and what makes it more wicked still is that the problem lies within us - which is the hardest place to look for problems!) (Thomas Reuter, University of Melbourne)	We're very surprised at this comment because this chapter does not cleave to the rational model of decision-making. As to the assertion that there is no such thing as a decision, just cause and effect, is itself a hypothesis. Given that the chapter is about the foundations of decision-making, we take the position that decisions do exist and summarise the literature on those methods and processes.
150	42469	2	3	19	3	25	The discussion on problem-oriented and solution-oriented decisions and relevant examples and relevant not clear and confusing (Shahbaz Mushtaq, University of Southern Queensland)	The discussion has been clarified sufficiently for this reviewer we hope.
151	45680	2	3	21	3	21	From individuals to systems - could this also include system of systems due to the the nature of adaptation (Roger Street, UK Climate Impacts Programme)	Added
152	47717	2	3	21	3	25	I feel this needs to include reference to psychological factors more explicitly (its not just a knowledge base, but things like values, beliefs, and attitudes that influence decision-makers). Suggest rephrasing to something like: "Decision-makers are influenced by internal psychological and cognitive factors, their physical and socio-cultural environments, and the institutions within which they operate." Then I would delete the line that begins "Two major influences on decision-making are..." as it is redundant. (Eric Toman, The Ohio State University)	Done
153	45681	2	3	22	3	22	the range of tools that they know and accept (Roger Street, UK Climate Impacts Programme)	Changed
154	48882	2	3	23	0	0	The importance of aspirations is identified, but not carried forward in subsequent sections - see later comments (Leon Soste, Department of Primary Industries, Victoria, Australia)	Noted - and will be dealt with later
155	43860	2	3	24	3	25	It will aid understanding if some examples are provided for the "socio-cultural (group) and cognitive/psychological (individual) factors". (Russell Wise, CSIRO)	The sections later on deal with this in a more organized manner in this draft
156	45682	2	3	26	3	26	round the structure out - need to clarify. (Roger Street, UK Climate Impacts Programme)	Actioned

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
157	36915	2	3	26	3	26	What are "delays"? (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
158	49445	2	3	29	0	0	Invert the triangle of the Figure 2-1 to show the hierarchy of decision-makers (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Figure deleted
159	47718	2	3	32	3	32	Should other methods/tools also be discussed besides scenarios? (Eric Toman, The Ohio State University)	Figure deleted
160	44164	2	3	41	3	42	The authors should elaborate further on the mentioned advances. Especially the conclusions of Preston et al. 2012 on key challenges associated with climate change vulnerability approaches (Table 4 in his publication, cited in line 42) is relevant here. For further discussions on vulnerability concepts see also Hinkel 2012 (Hinkel, J. Indicators of vulnerability and adaptive capacity: towards a clarification of the science-policy interface. Global Environ Change 2011, 21:198–208.) (Anne Holsten, Potsdam Institute for Climate Impact Research)	References added but cannot expand text by too much, small additions made
161	43693	2	3	44	3	50	Citing the ISO:31000, here and in section 2, does set out a relevant context for the issues that are being covered and the need to deal with uncertainty on the basis of risk management. However, that standard does not have any specific treatment of risks changing over time and why that can make anticipatory planning very important. So I would argue that this section also needs to bring in the growing development of some other strategies in this area that identify thresholds and timeframes for response such as done for the river Thames by: Ranger, N., Millner, A., Dietz, S., Fankhauser, S., Lopez, A., and Ruta, G., 2010: Adaptation in the UK: a decision-making process. Grantham Research Institute on Climate Change and the Environment, Centre for Climate Change Economics and Policy. (This is cited further on in the chapter.) (Martin Manning, Victoria University of Wellington)	It's implicit. Ranger et al and time factor added to 2.1.2
162	39484	2	3	46	0	0	definition of risk, not risk management. (Sarah Cornell, Stockholm Resilience Centre)	Corrected
163	48052	2	3	46	3	46	Is the definition of risk management or risk? (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	See above
164	52125	2	3	46	3	47	In discussing the definition for "risk management" here, the chapter team could also consider referencing the definition in the report glossary. If revisions to the definition in the report glossary would be beneficial, please be in touch with the glossary editors (or let the TSU know). (Katharine Mach, IPCC WGII TSU)	Done
165	43862	2	3	47	3	49	Another critical aspect of decision making under climate change is that many of the impacts of climate change and consequences of decisions are now non-marginal. This is an understated aspect of the context, particularly as evidence is now pointing to an unavoidable future of >2 and even >3 degree C warming combined with radically increasing scarcity of resources as populations continue to grow and resource-use demands increase exponentially. The critical implication of this is that many of the existing economic tools for informing decision making are all based on assumptions of marginality and partial equilibrium. this comment therefore applies more broadly than to just this part of the chapter. (Russell Wise, CSIRO)	We deal with this later in the chapter
166	48725	2	3	47	3	49	not necessarily true that climate change is different in these two ways. There are pervasive uncertainties in a host of decisions, e.g. whether or not there will be a regime change either by voting or violence, whether there will be a regional or global economic melt-down. And the decision-making under climate change doesn't necessarily have a longer time frame than other decision-making—it's an interplay between the stated time frame for the decision (e.g. 30-year mortgage, 5-year planning cycle) and the desire to think about longer-term changes that might affect some fundamental objective beyond the stated time frame of the immediate decision. (Jennifer Hoffman, EcoAdapt)	The sentence says most other contexts - we stand by this
167	45683	2	3	48	3	48	long time scales - need to improve the clarity of this phrase. The long time scales are those over which changes are projected to occur as decisions are needed now. Pervasive uncertainties - is there not also pervasive uncertainties (as suggested in the next sentence) in most other contexts? (Roger Street, UK Climate Impacts Programme)	When a decision is made is an important point but not for here
168	52445	2	3	52	0	0	Paragraph Comment: I am concerned with the adopted definition of a "good" decision. I make a critical distinction between good decisions and good outcomes. This is because one can make a good decision with the given information at a point in time and experience a less than optimal outcome. A good decision, using my definition, increases the likelihood of a desirable outcome but there is no guarantees except in the highly unrealistic situation of perfect information. Granted using an iterative decision framework allows the flexibility to adjust decisions as necessary given new information to increase the likelihood of achieving desirable outcomes on longer time horizons. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Changed to better decision and updated to be more consistent with this review comment to number 178
169	48502	2	3	52	3	53	It would seem that a basic desideratum for a good decision is also that a good outcome is sought (i.e. that appropriate decision criteria are used). (Dominic Roser, University of Zurich, University of Graz)	Noted
170	47618	2	3	52	3	53	The concept of a "good" decision and the given definition are somewhat surprising: By nature all decisions pertaining to CC are made under uncertainty. Ex-ante, a "good" decision is simply a "rational" one, i.e. one which does not exhibit any contradiction along the steps of the analytical process leading to it (setting objectives to reach, using information efficiently, assessing consequences, etc.). From this standpoint, since uncertainty can never be totally removed, there are perfectly rational decisions leading ex post to disastrous outcomes, i.e. far the "sought "ones. Precluding this possibility amounts to use systematically a "precautionary principle" (which is only one form of rationality), expressed as follows: always minimize the probability of occurrence of the worst event, regardless of any "good" consequences in case of alternative events: had Pasteur applied this principle he would have never found any vaccine. Now, if a decision under uncertainty leads ex post to outcomes meeting the sought ones (as proposed by the definition), it is simply the case of a lucky decision-maker. (Pierre BATTEAU, Aix Marseille UNiversité)	The current wording supports this

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
171	38202	2	3	52	3	54	I appreciate the definition of good decisions. However, the definition appears to focus on the outcomes of a decision not the process of making the decision. Further, apart from actual and perceived uncertainty influencing decisions the review does not seem to cover what processes would lead to good decisions and processes that might be barriers to good decisions. For instance, status quo biases can lead to resistence to accepting new policies. Similarly, a need to feel the world is just could result in resistence to perceiving risks but framing messages differently might be able to overcome this barrier. Feinberg, M., & Willer, R. (2011). Apocalypse soon? dire messages reduce belief in global warming by contradicting just-world beliefs. Psychological Science, 22(1), 34-38. doi:10.1177/0956797610391911 . There are other studies that address how framing can alter perceptions of climate change which then presumably influence decision making. (Janet Swim, The Pennsylvania State Universi)	Process added
172	48726	2	3	52	3	54	I don't like this definition of a good decision. Again from the structured decision-making class at the USFWS's NCTC: "A good decision does not guarantee a favorable outcome, but it accounts for uncertainty so as to provide the best chance of a favorable outcome." The idea here is that if there's uncertainty it's very possible to make a decision that gives you the greatest probability of a good outcome but to not achieve your outcome; indeed, if there's uncertainty it's often impossible to make a decision that guarantees a good outcome. Alternatively, it is entirely possible to get a good outcome from a poorly made decision; the outcome may not be related to the decision at all, but to some other stochastic factor. (Jennifer Hoffman, EcoAdapt)	Have altered to a better decision and framed it accordingly
173	41147	2	3	52	3	54	Section 2.1 pg3 line 52-54 - Narrow definition of a "good" decision. This should be expanded to include the requirement of using the best available information and being well-informed. It also is very open-ended leaving room for mis-interpretation of what the "life" of a decision is and could result in propensity to focus on short-term decisions or avoid long-term decisions. (Susan Evans, WWF-Canada)	time component added
174	47719	2	3	52	3	54	Should a standard for what constitutes a "good" decision also include some evaluation of whether the outcomes were appropriate? I realize this increases the subjectivity of this concept but feel (1) it better reflects reality (per the current definition, one could argue that increased use of GHG's would be "good" if the "outcomes sought" were limited to increased economic growth), and (2) the subjective nature of this value fits well with the discussion of wicked problems. (Eric Toman, The Ohio State University)	more nuanced language includes this consideration
175	42468	2	3	52	3	54	The definition could be problematic when considered from individual point of view. 'A good decision is one where the outcomes sought when the decision was made and implemented are met over the life of that decision'. Individual decisions may yield desired outcomes over the life of the decision but these decisions may not result socially desired outcome. (Shahbaz Mushtaq, University of Southern Queensland)	Collective aspect added
176	35599	2	3	52	3	55	Making a determination of a decision being "good" can be done only in retrospective terms. The authors meant to say making an appropriate decision. Appropriate decisions are based on utilizing all the available information and on rational logic. Passage of time would reveal if they were good or bad decisions. See Ayyub (2003). Ayyub, B. M., Risk Analysis in Engineering and Economics, Chapman and Hall/CRC Press, Boca Raton, FL, 2003, 571 pages, ISBN 1-58488-395-2. (Bilal Ayyub, University of Maryland)	We include more than rational logic here (see response to comment 149)
177	52751	2	3	52	4	4	I find the definition of a good decision ('where the outcomes sought' ... Etc) doesn't sit comfortably with the later acknowledgment (several times in the chapter) that multiple criteria may be applied to this question, including those relating to legitimate processes. Also, what is the 'life of a decision'? (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Think we have fixed this - definition now more consistent with further on
178	47175	2	3	52	34	2	The chosen language of 'good/bad decisions' is that of morality, and is therefore particularly at odds with the definition provided in italics (which is more in the domain of efficacy). When determining whether a decision is 'good', one cannot relegate the moral issue of 'who decides' and 'who is affectd' to the secondary status of 'how a decision can be assessed'. The decision of a despot to eliminate his/her opponents in order to remain in power, for example, could meet the desired outcomes over the lifetime of the decision. It would then be considered 'good' by the definition provided. But it is unlikely to be judged 'good' by human rights standards, for example. 'Good decision-making' (process) and 'good decisions' (outcome) may be quite different things. (Douglas Nakashima, UNESCO)	Added reference to section on morals and ethics
179	37655	2	3	53	0	0	In light of the now realized inability to avoid 2 degrees C of warming, maybe the text should have the added phrase: or in the absence of the sought outcome, an unacceptable outcome was avoided. (George Backus, Sandia National Laboratories)	Added with refs
180	45684	2	3	54	3	54	Suggest that there is a need for consistency in the language used - assess options and evaluate decisions. Difficult when using the two terms almost interchangably (Roger Street, UK Climate Impacts Programme)	Noted, although I can't see where. Assess options in not in the rewrite.
181	48053	2	4	1	4	4	It would be good to recognise the importance of decisions with regards to choice of method (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Done
182	43863	2	4	2	4	4	What about the stage of "risk diagnosis"? (Russell Wise, CSIRO)	No - that's a combination of scoping and analysis. Anyhow, text removed
183	45685	2	4	3	4	4	Also need to consider unintended consequences (Roger Street, UK Climate Impacts Programme)	Text removed
184	45686	2	4	6	4	9	There is also the question of sequential adaptation, adaptation pathways and transitional adaptation when considering the temporal nature of adaptation and the associated adaptation process. This introduces some further complexity into the decision process (Roger Street, UK Climate Impacts Programme)	Text removed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
185	38206	2	4	8	4	9	I agree that decisions can be short lived or have lasting effects but this seems to miss the point that decisions are linked and have cascading effects. That is, it treats decisions as distinct things and not related to each other. The relations are noted latter when discussion wicked problems and scenarios but these appear inconsistent with this statement. The unfolding nature of change and how it relates to decision making would be important to address. see for instance, Castro, p. (2012). Legal Innnovation for Social Change: Exploring Change and Resistance to different types of Sustainability Laws. Political Psychology. 33(1), 105-121. (Janet Swim, The Pennsylvania State Universi)	Text removed, but this ref looks good for the institutional section
186	42470	2	4	13	4	21	Excellent discussion and important research gaps. It would be ideal to achieve best decision but sometime it would be desirable (socially, politically and environmentally) to achieve 2nd best solution that may be more suitable under given constraints. Example of this could be 'water prices' etc (Shahbaz Mushtaq, University of Southern Queensland)	Point taken but the discussion has already been edited for space - will mention this later
187	49434	2	4	14	0	0	Detail the criteria used by people when making decisions under a changing climate (Fabiola S. Sosa-Rodriguez, University of Waterloo)	We cannot do this here for reasons of space
188	44848	2	4	14	0	16	Other literature that should also be cited includes: Tryhorn, L., & Lynch, A. (2010). Climate change adaptation in the Alpine Shire of Australia: a decision process appraisal. Policy Sciences, 43(2), 105-127. (Carolina Adler, Swiss Federal Institute of Technology (ETH) Zurich)	Added
189	54687	2	4	14	4	15	The author team may consider adding specific details about 'multiple preferences' (Monalisa Chatterjee, IPCC WGII TSU)	Will do later
190	52753	2	4	19	0	0	Descriptive theories may also be referred to as 'positive'. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Done
191	52446	2	4	19	0	0	Paragraph Comment: Are there citations for problem- and solution-oriented decisions? I have never heard of this distinction and the examples provided give me some sense of the distinction, but another example or two may be useful. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	This distinction has been deleted here and moved to 2.3.1 but should probably be flagged in the intro. Agree about refs and they are included.
192	52752	2	4	19	4	25	It isn't clear where the distinction between problem-oriented and solution-oriented decisions originates in relevant literature. Some references are needed. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	This distinction has been deleted here and moved to 2.3.1 but should probably be flagged in the intro. Agree about refs and they are included.
193	47720	2	4	20	4	25	This paragraph needs some citations. (Eric Toman, The Ohio State University)	This distinction has been deleted here and moved to 2.3.1 but should probably be flagged in the intro. Agree about refs and they are included.
194	42285	2	4	22	4	22	"Solution-focused decisions" should be "Solution-oriented decisions". Keep consistent (Luhui Yan, Tanzuji)	Passage deleted
195	47721	2	4	27	4	35	I think it is important to distinguish between complexity (several variables interacting in an unkown way) and wickedness (several variables interacting in an unknown way tied up with human values). The current formulation seems to suggest that problems are simple or they are wicked. However, there are several complex problems that are just hard to figure out but not influenced by social variables (e.g., determining how to make litium ion batteries last longer). See Allen, G. M. and E. M. Gould Jr. 1986. Complexity, wickedness, and public forests.Journal of Forestry 84(4): 20-23. (Eric Toman, The Ohio State University)	complexity and wickedness clarified but no room for examples
196	52945	2	4	30	4	30	Probably should not put next to each other statements that wicked problems are unbounded and that they not well bounded. (Kristie L. Ebi, IPCC WGII TSU)	Edited
197	45687	2	4	32	4	32	...have unclear and multiple solutions and pathways... (Roger Street, UK Climate Impacts Programme)	Text deleted
198	54157	2	4	34	4	35	This statement could be framed more clearly has a finding, as currently it is not completely clear what the alternative would be if the statement is "not correct". In addition, it is unclear what evidence the statement is based upon. (Michael Mastrandrea, IPCC WGII TSU)	Removed
199	49963	2	4	35	4	35	"high confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. (Katharine Mach, IPCC WGII TSU)	Done
200	49026	2	4	35	4	36	Please integrate key findings related to this aspect into the executive summary (Oyvind Christophersen, Climate and Pollution Agency)	Done
201	46683	2	4	47	0	0	Section 2.2: Too academic texts..... (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	Noted and clarified
202	49440	2	4	47	0	0	What characteristics make the decision-making process of institutions more efficient under a changing climate (section 2.2) (Fabiola S. Sosa-Rodriguez, University of Waterloo)	This is dealt with in Section 2.2.2 but will be improved further
203	45688	2	4	52	4	53	...such as climate projections and cost-benefit analysis of... I understand that these are only illustrative, but would prefer climate knowledge and information, and costing approaches as climate projections and CBA are too narrow and provide a limited perspective (Roger Street, UK Climate Impacts Programme)	Revised
204	36916	2	4	54	4	54	The imapcts of climate change on cultural heritage is most hypothetic. Most historic buidlings in Southern Europe experience high temperatures already since since centuries. Slr might affect only buildings in close vicinity to the shoreline. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
205	52447	2	5	4	0	0	Paragraph Comment: I was quite surprised to see a lack of the seminal decision science papers from scholars such as Howard and Raiffa and citations of other notable decision scientists who have shaped the fields in one or more of the 4 sub-disciplines. There was a field of decision science that was alive much before the Wharton department and papers have been written about the founding of the field of decision sciences that should be cited and are much more relevant than the founding of a department with such a name, particularly because there are other notable programs at Duke, Stanford, and Harvard. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Revised to provide broader overview

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
206	36917	2	5	4	5	9	This section could be treated more differentiated. The high vulnerability of Southern European Regions as compared to Northern Europen Regions is also strongly based on a generally lower adaptive capacity. If this human factor changed, also the vulnerability would be lowered. Please see the following report for details: ESPON Climate. 2011. "Climate Change and Territorial Effects on Regions and Local Economies". Luxembourg. Downloadable from: http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/climate.html (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
207	46684	2	5	7	5	11	These statements are contested. The science of decision making has evolved in various other disciplines and also in various other academic institutions and even in various practices which is beyond the premises of Department of Decision Sciences in the Wharton School of the University of Pennsylvania in the USA. We should make this paragraph a bit broader. (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	Revised to provide broader overview
208	40712	2	5	8	0	0	The chapter discusses decision science but not the public policy literature about policy making and policy implementation. Given the centrality of the need for public policy on climate change, I think this literature would be worthwhile to at least note. One good reference is the book: Hill, M. and P. Hupe. 2009. Implementing Public Policy. 2nd Edition. Los Angeles, CA: Sage. Decision science seems to be about how individuals make decisions (to say that “people make decisions” seems rather obvious), but there are many levels of decision-making and many types of decision-making related to climate, e.g. policymakers (global, national, subnational, community levels making decisions with wide-reaching effects on many other people), private sector leaders (e.g. firms making decisions about business that have implications for climate change), nongovernmental organizations (e.g. advocates advocating for policies or ways of addressing climate change), and individuals (making decisions about their own consumption levels and other actions that affect and are affected by climate change). The chapter currently seems to treat all decision-makers alike, but there is a big difference between policymakers, private sector leaders and individuals – and the context and calculus surrounding the climate-related decisions they will be making. The decision support each of these (and other) groups need is different. Having a table early on that lists decision-makers and the types of decisions they make – and the potential impact of those decisions – would be helpful. A similar table could identify the different decision supports that each group needs. (Karen Hardee, Futures Group)	Good comment, incorporated.
209	40713	2	5	13	0	30	The paragraph of lines 13-21 is very theoretical – the theory behind human reasoning. Isn’t the point here that humans are not always rational in thought processes? The first sentence on page 5, line 23 refers to the precautions that “people” may or may not take in the face of disasters. Again, “people” can refer to policymakers enacting disaster management policies, community managers directing evacuation plans or individuals taking shelter. To lump all of those levels of decision-makers into “people” obscures the complexity of decision-making that is required for CCIAV. (Karen Hardee, Futures Group)	Complexity of CCIAV decision-making further elaborated.
210	47722	2	5	16	5	21	I suggest including the concepts of Expected Utility Theory (e.g., Mongin 1997) and Bounded Rationality (Simon 1990) here. This would also allow an introduction to the concept of heuristics that is discussed in the subsequent section. Mongin, P. (1997). Expected utility theory. Handbook of Economic Methodology.London: Edward Elgar, , 342-350. Simon, H. (1990). "Invariants of human behavior." Annual Review of Psychology 41: 1-19. (Eric Toman, The Ohio State University)	Simon is mentioned in the text but we feel that expected utility theory is more for Chapter 17
211	45689	2	5	23	5	24	...when they have sufficient resources, knowledge and access to knowledge to do so and... (Roger Street, UK Climate Impacts Programme)	Modified
212	52946	2	5	23	5	30	This highlights the problem with focusing on climate change alone, instead of including exposure and vulnerability. (Kristie L. Ebi, IPCC WGII TSU)	Noted and text axpanded within the chapter
213	45690	2	5	25	5	26	Need to clarify this sentence - literature offers ways to better align people's choices with their goals (Roger Street, UK Climate Impacts Programme)	Modified
214	42286	2	5	29	5	29	"recently" to be "recent"? (Luhui Yan, Tanzuji)	Addressed
215	49435	2	5	38	0	0	Expand the discussion on the iterative risk management framework: a) explain its characteristics, advantages and disadvantages; b) describe how decisions are taken; and c) clarify how this framework can be used on CCIAV (section 2.2.1.2 and 2.2.1.7) (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Iterative risk management explained in detail in new section 2.1.2
216	40714	2	5	38	0	0	The title of section 2.2.1. is “Conceptual Frameworks for Climate-Related Decisions, but no conceptual framework is actually presented in the section. Suggest renaming the section. (Karen Hardee, Futures Group)	Done
217	40715	2	5	40	0	42	Lines 40-42 talk about people using “a variety of decision frameworks to make individual choices and as part of groups and institutions of which they are a part. By decision framework, we mean the set of ideas, values, rules, heuristics, and habits that people use to make the many choices they face.” I would call those filters or factors that affect decision-making, but not a decision framework. (Karen Hardee, Futures Group)	Modified
218	48883	2	5	50	0	0	.. Mentions '3 sets of ideas'.. First (decision support) is clear..others are not (Leon Soste, Department of Primary Industries, Victoria, Australia)	Addressed
219	41304	2	5	50	6	3	It is not clear what these three sets of ideas are that are supposed to structure this section. (Gisela Böhm, University of Bergen)	Addressed
220	54158	2	5	52	5	54	As before, this statement could be framed more clearly as a finding, as it is not clear what the alternative would be if this is "not correct." For example, would the alternative be that decision processes are not as important as good information? (Michael Mastrandrea, IPCC WGII TSU)	Modified
221	52947	2	5	52	5	54	This key finding should be in the Executive Summary. (Kristie L. Ebi, IPCC WGII TSU)	Deleted here but the point is carried through

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
222	49964	2	5	54	5	54	"high confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. (Katharine Mach, IPCC WGII TSU)	See above
223	47463	2	6	0	6	0	On this page at the latest I got the impression, an overview table on all the classifications that are introduced in the course of this chapter would be in order – or a 'meta-figure' that announces all the other figures to come. (Hermann Held, University of Hamburg)	Classifications have been simplified, but the suggestion is good and we are holding it over for the next draft
224	52948	2	6	6	6	6	This section is a rather standard description of decision support, without reflecting the challenges and nuances that often arise when considering approaches to manage the risks of climate change. It would be very helpful to discuss approaches for decision support for wicked problems. (Kristie L. Ebi, IPCC WGII TSU)	Incorporated in Section 2.1.2
225	48002	2	6	6	14	19	These sections read as though they are written as original research for an academic purpose rather than as review material for an assessment, and the connection of this material to decision support in the context of climate change and risk management is not clearly articulated. The paragraph immediately preceding states that the purpose of this section is to propose that iterative risk management is the principal framework for CCIAV, but the section does not appear to do that effectively. (Patricia Jacobberger-Jellison, NASA)	The chapter has been reorganised to address this very issue
226	54159	2	6	8	6	9	Is this evidence assessed in the chapter? It would be very useful to cross-reference or point to where it is assessed in some way. (Michael Mastrandrea, IPCC WGII TSU)	Hmm, still haven't located where this is said, although it is widely discussed in the chapter and the text has been changed to reference better decisions
227	52448	2	6	8	6	9	Perhaps some clarification of this high confidence statement is needed because decisions involve both science and value judgments and as a result there may be some decisions where the consequences, as determined from the scientific information, are such that there is a clear choice regardless of the tradeoffs among objectives. This is pretty rare and may be the circumstance intended in the statement. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	We do assume this yes, but this point also covers a very wide range of decisions
228	41305	2	6	8	6	10	Reference for this claim? (Gisela Böhm, University of Bergen)	See above responses (226, 227)
229	42471	2	6	8	6	10	The discussion seems very vague – not clear. (Shahbaz Mushtaq, University of Southern Queensland)	See above responses (226, 227)
230	52949	2	6	8	6	10	This information is repeated. (Kristie L. Ebi, IPCC WGII TSU)	See above responses (226, 227)
231	49965	2	6	9	6	9	"high confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. (Katharine Mach, IPCC WGII TSU)	Done
232	48884	2	6	10	0	0	include, but are not limited to, access to information' - suggest add other elements - access to info appears self-evident (Leon Soste, Department of Primary Industries, Victoria, Australia)	Text edited
233	52449	2	6	15	6	16	quote is missing citation (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Added
234	48886	2	6	16	6	37	the link b/w the learning environment required for the development of 'deeper understanding' (line 16) and 'mutual learning' (36) & the 3 decision support elements (products, services & support systems - lines 23/25) is not immediately obvious. Is this learning environment intended to be provided within 'support systems' or elsewhere? Not clear. The establishment of a learning environment also links to - 'emphasise processes over products' (line 53) & 'incorporates learning' (p7, line 10) (Leon Soste, Department of Primary Industries, Victoria, Australia)	Text has been simplified to remove this complexity
235	36918	2	6	17	6	17	Please see the report quoted above for a review of these policies (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
236	54160	2	6	17	6	21	Are these surveys the papers that are cited earlier in the paragraph? This could be clarified. In addition, citations are needed for the rest of the section after this point. (Michael Mastrandrea, IPCC WGII TSU)	Text removed
237	48885	2	6	23	6	49	section 2.2.1.1 has 3 types of elements (line 23), 3 categories (line 32), 5 key elements (41/42), 6 principles (49) - a tad messy. May wish to rephrase (Leon Soste, Department of Primary Industries, Victoria, Australia)	Simplified
238	49966	2	6	23	7	19	It would be preferable to provide examples of citations supporting the information characterized in these paragraphs. (Katharine Mach, IPCC WGII TSU)	These criteria have been simplified and approriately referenced
239	48001	2	6	23	7	19	The section first lists three components for decision support (products, services, support systems) and shortly follows with a list of six items that constitute effective decision support (begin with user needs, emphasize process over products, link users and producers of information, build connections across disciplines/organizations, seek institutional stability, incorporate learning). These two lists have not been connected well in the text (and in at least one case, they are contradictory) and it is not clear to the reader to understand why they are both there. (Patricia Jacobberger-Jellison, NASA)	Simplified
240	52950	2	6	23	7	19	This section could use some references. (Kristie L. Ebi, IPCC WGII TSU)	See above
241	35746	2	6	25	6	6	Under the support system, word "corporates or businesses" may be inserted. This entity is important as decision support due to technical skill and knowledge. You may like also to consider defining the term and adding in the glossary. In Chapter 16 Blennow and Persson ; Frank et al., and Patt and Schröter, have identified this as one of the actors (Chapter 16) (Jitendra Desai, Reliance Indusries Limited)	We have used organisations and institutions but are open to chnaging these in cooperation with other chapters
242	52450	2	6	30	0	0	Paragraph comment: missing citations (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Done
243	40716	2	6	30	0	37	This paragraph makes decision-making through use of decision support, sound too easy – and suggests that decision support will result in building better relations and trust among stakeholders. That might happen, but also might not. Decision support that works for some stakeholders might not work for others. (Karen Hardee, Futures Group)	Clarified
244	52951	2	6	33	6	33	How is better defined? (Kristie L. Ebi, IPCC WGII TSU)	This is now done where btter decisions are discussed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
245	43865	2	6	34	6	35	Probably worthwhile referencing to Cash et al (2003) here?: Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N., Guston, D.H., Jäger, J., and Mitchell, R.B. 2003. Knowledge systems for sustainable development. Proceedings of the National Academy of Sciences 100 (14): 8086-8091. (Russell Wise, CSIRO)	Have used Cash et al throughout the chapter
246	39140	2	6	35	6	37	As I said, I don't like the "decision making" language you use, but here you do make an important point I would like to comment upon. Overcoming cultural barriers between stakeholder groups and scientists is crucial. But scientist must come to the meeting with more than just information. The key will be to provide a credible vision for a rather different but highly desirable society of the future. this kind of vision is sadly lacking. What we have instead is a set of suggestions for dealing with a problem nobody ever wanted to deal with, and oh well, if we really must respond to it, maybe we will.... or maybe not. In any case, people are essentially being asked to do something they are unwilling to do (cut energy use, stop wasteful consumption, accept lower profit margins, etc). It is a doomsday scenario we offer as a deterrent, and hence we put our chips on fear rather than hope. Yet fear does little more than inspire knee-jerk reactions. Hope is the mother of what is to come. From my conversations with IPCC panel members and my recent attendance of the Rio+20 summit, there is not much hope around. Indeed, the scientific community is in a state of hopelessness, in the face of an evident lack of political will for change. Perhaps science can offer no ultimate reason for hope and happiness to human beings? If so, who can? Where are the visionaries in the IPCC? Where are the risk takers among the preachers of risk avoidance? (Thomas Reuter, University of Melbourne)	Point taken. We think it is also important
247	52451	2	6	39	0	0	Paragraph comment: missing citations (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Edited to cover general chapter approach
248	52952	2	6	39	6	39	There is a temporal scale issue here that is not addressed. When does one decide that a decision was "better" -- when it is made, in 10 years, 50 years, etc.? (Kristie L. Ebi, IPCC WGII TSU)	Temporal element now discussed
249	52953	2	6	41	6	50	There is overlap between these paragraphs. (Kristie L. Ebi, IPCC WGII TSU)	Fixed.
250	45692	2	6	42	6	45	Also need to include making the decision, monitoring to inform subsequent evaluations (Roger Street, UK Climate Impacts Programme)	We do this later
251	48887	2	6	42	6	45	The 5 key elements of the decision support process appear somewhat linear, with a limited sense of the process being iterative or reflective. In addition, element 1 (42/43) may wish to include a reference to the importance of multiple framings. Element 2 (42) might explore why the given objectives are important and link that importance to achievement of aspirations (p3, line23) (Leon Soste, Department of Primary Industries, Victoria, Australia)	Edited
252	45691	2	6	45	6	47	There is a need for transparency in the process that allows for the required judgement (Roger Street, UK Climate Impacts Programme)	This is discussed later
253	52954	2	6	46	6	46	What about the challenges of interactions across sectors and scales? (Kristie L. Ebi, IPCC WGII TSU)	Aaargh, yes. Still looking for good lit.
254	39485	2	6	49	0	0	Most of this concepts section is under-referenced, so it feels a bit text-booky. This line is particularly obvious - if this is the chapter author's own synthesis made just for the IPCC process, then it would be good to be clear about it. (Sarah Cornell, Stockholm Resilience Centre)	Edited and more tightly referenced
255	52453	2	6	49	0	0	Paragraph Comment: I think it's important to emphasize that though these are good practices in many situations, in others it may not be the best method to proceed. For example, users may not know or know how to articulate their needs and an effective boundary organization or individual that knows the science and decision-making context may be able to better identify the scientific information (or translation of such information) that would be effective in such a decision-making context. In such circumstances, there are steps before identifying the users needs, such as decision context research and engagement with such decision-makers to identify entry points for such climate information and decision opportunities. The paragraph afterwards alludes to some of the things that I mention, but I think I'm missing something. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Text has been removed
256	52452	2	6	49	0	0	Paragraph comment: missing citations (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Text has been removed
257	41306	2	6	49	6	50	Reference for this claim? (Gisela Böhm, University of Bergen)	Text has been removed
258	42622	2	6	49	7	11	If possible include references for each of these "principles"; this could be examples from the literature of cases in which each principle was a key component for success. (Erin Coughlan, Red Cross / Red Crescent Climate Centre)	Text has been removed
259	39487	2	6	49	7	19	There are internationally agreed policies, to a point, that support these principles - perhaps flag that here (eg Agenda 21, Aarhus convention) (Sarah Cornell, Stockholm Resilience Centre)	Text has been removed
260	43866	2	6	52	7	11	Why only mention "users and researchers" when user needs can also be identified and developed with organisations and people other than researchers (i.e., there are many on the ground aid agencies that facilitate learning but are not researchers). In fact, all these bullet points need to recognise and acknowledge this: it is not just decision makers and scientists that are involved! There are many various components/groups within communities that are critical to facilitating links, learning and decision making. (Russell Wise, CSIRO)	Text has been removed
261	39486	2	6	53	0	0	Prefer 'emphasises processes alongside products'... (Sarah Cornell, Stockholm Resilience Centre)	Text has been removed
262	41307	2	6	53	6	54	Point 2 (process over product) contradicts the definition of a good decision given on page 3 (outcome of decision is what counts). (Gisela Böhm, University of Bergen)	Text has been removed
263	45693	2	7	1	7	1	incorporate systems that engage (informed and sustained engagement) of users and providers (Roger Street, UK Climate Impacts Programme)	Text has been removed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
264	39141	2	7	1	7	3	The problem with this lovely idea of getting everyone to sit around a table in a spirit of mutual respect and a commitment to making humane decisions is that some of the most powerful 'decision makers' will not sit at the table with you at all, nor will they let you anywhere near their tables. At the most you will talk to politicians, and - I am sure you know yourself that politicians serve as PR people of the corporate owners rather than as representatives of public interests in today's 'democracies.' In short, you propose open and equal debate with people who are much more powerful than you and have a criminal motive in maintaining the fossil fuel economy as long as possible. Is discussion the appropriate way to deal with systemic crime? (Thomas Reuter, University of Melbourne)	This point refers to the political economy of mitigation - not a topic we deal with
265	48888	2	7	2	0	0	suggest - differing cultures and perspectives... (Leon Soste, Department of Primary Industries, Victoria, Australia)	Text has been removed
266	52955	2	7	11	7	11	What about monitoring and evaluation to provide information for iterative management? (Kristie L. Ebi, IPCC WGII TSU)	Text has been removed
267	52956	2	7	13	7	19	There also are issues with integration across local to national scales. (Kristie L. Ebi, IPCC WGII TSU)	Text has been removed
268	38203	2	7	13	7	19	This description focuses on community as the level of analysis. As such, seems like discussions about communities (e.g., social capital) that influence decision making would be helpful. E.g., http://www.bis.gov.uk/assets/foresight/docs/international-dimensions/11-1029-climate-change-and-social-capital.pdf. (Janet Swim, The Pennsylvania State Universi)	Text has been removed
269	45694	2	7	16	7	16	Rather than being more focused on just raising awareness this should be broadened to include building adaptive capacity. (Roger Street, UK Climate Impacts Programme)	Text has been removed
270	48889	2	7	22	0	0	prefer the term Ongoing Risk Management rather than Iterative risk m/ment.. (Leon Soste, Department of Primary Industries, Victoria, Australia)	Sorry, the literature has spoken
271	40717	2	7	24	0	0	The sentence, “The climate change literature has increasingly adopted an iterative risk management framework” seems too broad. Do you mean the CCIAV literature? (Karen Hardee, Futures Group)	Fixed, but the argument has been put forward that the whole process of cc research and policy response has been iterative
272	45695	2	7	30	7	30	...case of many climate-related decisions-for decades if not longer'. This is the long-time scales associated with climate change (see earlier comment) (Roger Street, UK Climate Impacts Programme)	responded earlier also
273	39488	2	7	32	0	0	Poor sentence structure - "a tame risk that […] manages risk is a process" - suggest: Situations involving a linear process where hazards are identified, risks analysed, … can be regarded as 'tame' risk situations. Again, internationally agreed risk and disaster policy recognises the need for iterative approaches, and these could be referenced here. BMSA (2007) New Directions for Understanding Systemic Risk. Conference Report, Federal Reserve Bank of New York and the National Academy of Sciences Board on Mathematical Sciences and Their Applications (BMSA). Ch. 3. The National Academies Press, Washington DC, USA. Available for online viewing: books.nap.edu/openbook.php?record_id=11914&page=29; also literature in International Risk Governance Council (2009) Emerging Risk. Retrieved fromhttp://www.irgc.org/Emerging-risks.html (Sarah Cornell, Stockholm Resilience Centre)	Language fixed. Refs added
274	47723	2	7	32	7	33	"Tame" problems should be defined for its first use. The distinction between tame and wicked problems is very important for this discussion and I would suggest adding more to describe these and justify why climate change is wicked than has been done up to this point in the article (including the current description of wicked problems in Ch 2, p. 4, lines 27-35). (Eric Toman, The Ohio State University)	Have cut the tame reference here and clarified 'wicked'
275	41308	2	7	32	7	33	anthropomorphism; a risk cannot identify risks etc. (Gisela Böhm, University of Bergen)	Has misread the sentence
276	43867	2	7	32	7	39	This paragraph is not clearly written. Additionally, the way this is written implies that tame risks do not need to follow an iterative process. All types of risk, irrespective of how tame or wicked, should be iteratively addressed. The critical aspect that is different between the tame and wicked risks is the upfront process and approaches to diagnosing the context/problem/risks etc and how this should be iteratively updated over time. (Russell Wise, CSIRO)	Language fixed and tame removed
277	47724	2	7	33	7	39	The risk management planning process here is unclear (the text "two levels of three interations" is vague). The figure is decent but perhaps the different groups of boxes can have specific labels to describe the set of activities at a higher level (e.g., what do these groupings mean?). Also, in the Figure (Ch. 2, p. 53) it seems that something should be done to identify a starting point...as it is now, my eye kept going to the grouping in the bottom, left circle (Make decision - implement decision - monitor and reassess). (Eric Toman, The Ohio State University)	Clarified in the text
278	49967	2	7	34	7	39	It would be helpful to clarify how these statements should be interpreted with respect to figure 2-2. Additionally, it would be best also to provide further introduction to that figure in the caption for it. (Katharine Mach, IPCC WGII TSU)	Done
279	45696	2	7	38	7	38	...an assessment is exhausted and...' Not clear what this is suggesting? Assessment is or should be a continuing process. When the monitoring and evaluation suggest the need for further or renewed action, re-assessment, including of the objectives is necessary. (Roger Street, UK Climate Impacts Programme)	Wording changed - obviously there is a stage where the current set of arrangement may not longer suit and the process is recommenced, not sure why this is not apparent - decision context does not remain constant
280	37657	2	7	39	0	0	[Sterman J.D., Sweeney L.B., 2007: Understanding public complacency about climate change: adults’ mental models of climate change violate conservation of matter. Climatic Change, 80:213–238.] [Sterman J.D., 2008: Risk communication on climate: mental models and mass balance. Science 2008, 322:532–533.] [Sterman, J.D. and Booth Sweeney, L.,2002: Cloudy skies: assessing public understanding of global warming. System Dynamics Review, 18(2), 207–240.] [Sterman, J., 2011; Communicating climate change risks in a skeptical world. Climatic Change, 108(4)811-826, DOI: 10.1007/s10584-011-0189-3.] [Tollefson J. 2009: Instant climate model gears up. Nature. 461(7264):581.] (George Backus, Sandia National Laboratories)	These refs are good for the perceived risk part

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
281	37656	2	7	39	0	0	Page 7, line 39. I think the concepts here need to have more context and to be made more concrete. Add(?): All assessments use some form of modeling to consider interventions and outcomes. Those assessments ultimately use the mental models of interactions the participants have or the assessments also use formal computational models [Sterman 2012, Tollefson, 2009]. Human beings have an inability to consider the consequence of delays and feedback processes over time (Sterman and Sweeney, 2002). Experiments show these limitations certainly play out when considering climate change policies (Sterman, 2008, Sterman and Sweeney, 2007). Climate change and its impacts unfold over time and act differently on individual, interconnected, areas of the globe. Only computational models can overcome the limitations of the mental models, but decision makers must understand and accommodate the limitations of applying and using computational models as well (Sterman, 1988). [Sterman JD. A skeptic's guide to computer models. In: Grant L, ed. Foresight and National Decisions. Lanham, MD: University Press of America; 1988: 133–169.] (George Backus, Sandia National Laboratories)	This is better later - check for next section
282	49446	2	7	42	0	0	The hierarchy of decision-making levels is not clear in Figure 2-2 (Fabiola S. Sosa-Rodriguez, University of Waterloo)	It's not clear to me why they should be
283	48890	2	7	47	0	0	Formal risk assessment has moved away from' … comment - where I come from it still appears to be primarily a technocratic process. May wish to consider words such as .. Appears to be moving etc (Leon Soste, Department of Primary Industries, Victoria, Australia)	Words changed, refs added
284	52126	2	7	52	8	3	In discussing definitions for "risk" here, the chapter team could also consider referencing the definition in the report glossary. If revisions to the definition in the report glossary would be beneficial, please be in touch with the glossary editors (or let the TSU know). (Katharine Mach, IPCC WGII TSU)	Done
285	45697	2	8	1	8	1	Not sure that the meaning of 'outcome' is clear? (Roger Street, UK Climate Impacts Programme)	Rosa has done a good job with this definition - outcome is quite widely accepted and understood
286	39489	2	8	2	0	0	Somewhere in this paragraph it should state that hazard assessment is still important, even with the normative emphasis of ISO 31000 - the key issue about current risk thinking is that hazard is dealt with (quantitatively etc) as a distinct aspect, rather than previous risk treatments that tangled them together. (this chapter is thus a *necessary* complement to the others in WGII - CCIAV needs both risk and hazard analysis). (Sarah Cornell, Stockholm Resilience Centre)	Wording added
287	40880	2	8	7	0	0	As an alternative to tradeoffs, studies suggest integrating climate risk with other types of risk management. (Hellmuth M.E., Mason S.J., Vaughan C., van Aalst M.K. and Choularton R. (eds) 2011. A Better Climate for Disaster Risk Management. International Research Institute for Climate and Society (IRI), Columbia University, New York, USA. (Lynn Wilson, SeaTrust Institute)	Added and slightly reworded
288	47725	2	8	7	8	10	These are good points, but it feels very jargon-laden (e.g.mainstreaming, institutional and governance structures, different epistemologies, etc.), in the current version. I don't expect the text here will be very clear to those with little background in decision support. Maybe move the final sentence of this paragraph (lines 9 and 10) to after the description of epistemology and the description of the different types of risks. (Eric Toman, The Ohio State University)	Much better explained
289	43868	2	8	8	8	9	Another confusing use of the words "governance" and "institutions". Institutions are a component of governance arrangements, so the way this sentence is written doesn't really make sense. (Russell Wise, CSIRO)	Text cut, but they were just listed here - don't understand the objection
290	41309	2	8	19	8	30	Re. Types of risk. Type 4: You can of course define perceived risk as a term that applies only to lay judgments if you so wish, but this strikes me as somewhat idiosyncratic. I have seen this term frequently used as referring also to expert judgments. Type 5: Risk is an ex ante concept, it makes sense to talk about risk only before the event. You can observe damage, but not risk. (Gisela Böhm, University of Bergen)	An interesting point - this was taken from the earlier literature but an amendment has been made. However, the point of perceived risk through an expert process is ok for off the cuff expert judgements but not for deliberated assessments. It is an epistemological point
291	49436	2	8	19	8	41	Link the five types of risks described in page 8 to climate change (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Sorry, but no.
292	36919	2	8	21	8	21	The negative impact of climate change on precipitation patterns is manifested only in some regions in the Mediterranean. Other Mediterranean regions do not experience decreases in precipitation (e.g. José Quereda Sala, Enrique Montón Chiva y José Escrig Barberá (2009). El cambio climático en las Regiones de Valencia y Murcia: La sombra analítica de un auténtico troyano. Investigaciones Geográficas, nº 49 (2009) pp. 109-127 and Molto Mantero, E. (2008) "El clima pasado y presente de la Montaña Alicantina" Revista de divulgación paleontológica, Ed. Asociación Paleontológica Alcoyana "Isurus", ISSN:1888-9441. Pp.28-45. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
293	52454	2	8	22	0	0	Comment: do they use the term dangerous or do you because it is a normative term that would be defined differently by different people. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	They use it. It is well known and argued exactly on the terms you mention.
294	47464	2	8	27	8	29	The logical link from 3. to 4. is not immediately clear to me. (Hermann Held, University of Hamburg)	Fear, trepidation, conclusion.
295	45698	2	8	29	8	29	...untrained member of the general public... Can this not also be the case for specific groups such as politicians, interest groups, media who may also have preconceived perspectives? (Roger Street, UK Climate Impacts Programme)	Language clarified - see comment 292
296	48727	2	8	30	0	0	given that your definitions of risk center on uncertainty about outcomes, the concept of observed risk needs further explanation. For example, what does it mean to say the uncertainty about outcomes observed once an event is realized? Are you instead referring to observed outcomes? (Jennifer Hoffman, EcoAdapt)	This is more or less, a Bayesian concept. Have added text to that effect.

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
297	48503	2	8	31	8	32	This is a confusing sentence. It would be more illuminating for me if one claimed that the expression of "risk" is used to cover different notions; and that for some of these notions (in particular as far as the perception of risk is concerned), risk depends on social and cultural experience. On the different notions of risk, I found the following helpful: Sven Ove Hansson, "Philosophical Perspectives on Risk", Techne 8(1):10-35, 2004. http://plato.stanford.edu/entries/risk/ http://plato.stanford.edu/entries/probability-interpret/ (Dominic Roser, University of Zurich, University of Graz)	Am not sure why this is confusing but surely the next sentence explains it. It is saying that a single risk is constructed of different notions. Hansson is cited in the following point
298	36920	2	8	31	8	32	This statement has to be differentiated. Land uplift occurs on the Scandinavian shield (i.e Finland, Sweden and Norway), also called "Fennoscandia". "Scandinavia" on the other hand does not include Finland but contains Denmark, which does not experience pronounced isostatic uplift. Indeed, the uplift is strongest in the Bothnian Bay and decreases South of 60 degrees North. Some parts of the Souther Baltic Sea experience land subsidence, others are stable. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
299	52957	2	8	31	8	41	This is mostly discussed earlier. (Kristie L. Ebi, IPCC WGII TSU)	Hopefully the edit has removed this repetition.
300	35823	2	8	35	0	36	Also see: Brewer, P.R., and Pease, A. 2008. Federal Climate Politics in the United States: Polarization and Paralysis, pp. 85-103 in Hugh Compston and Ian Bailey, Turning Down the Heat: The Politics of Climate Policy in Affluent Democracies, New York: Palgrave Macmillan (Robert Brulle, Drexel University)	Added
301	35822	2	8	35	0	36	There is recent research that shows that scientific information has virtually no impact on the public's level of concern regarding climate change. Rather, it is elite cues from political leaders, media coverage levels, and competing events, including economic activity levels, that drives public concern. This presents a direct empirical refutation of the information deficit model and the role of science in political decision making. This section should be expanded to address this issue. See the following reference: Brulle, Robert J., Jason Carmichael, and J. Craig Jenkins. 2012. Shifting Public Opinion on Climate Change; An Empirical Assessment of Factors influencing Concern over Climate Change in the U.S. Climatic Change (Robert Brulle, Drexel University)	This is a good point but my thought is that this general point is covered here. We are not in a position to assess public belief and CCIAV
302	49968	2	8	47	8	47	"moderate confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. Additionally, presumably the author team means "medium" here instead of "moderate" to be consistent with the uncertainties guidance? (Katharine Mach, IPCC WGII TSU)	Done
303	54162	2	8	47	8	47	The later sections mentioned here should be specified to support the traceable account. (Michael Mastrandrea, IPCC WGII TSU)	No idea what this means
304	52958	2	8	47	8	48	This key finding should be in the Executive Summary. (Kristie L. Ebi, IPCC WGII TSU)	Still haven't done this butwill next tiem - it's implicit but not explicit
305	47726	2	8	47	8	51	This discussion of the different risks and how they fit together needs more text. Also, "socially constructed risk" has not been mentioned previously and seems to be introducing a new concept. How does it differ from the types of risk described above? If relevant, why is it not described in greater detail and included in the list above? (Eric Toman, The Ohio State University)	List amended to bring this concept more squarely under perceived risk
306	39142	2	8	49	8	51	As a social scientist, I applaud your efforts to distinguish between objective and perceived risk, so long as it is made clear that perceived risk refers to objective mental states arising from the impact of social processes on individual persons or groups of persons. Perceived risk is objective too.... That means we need to accept the need for dealing with psycho-social realities as realities sui generis. (Thomas Reuter, University of Melbourne)	No - perceived risks are not objective, but they can be treated objectively. We try to do this.
307	54163	2	8	53	8	7	If possible to include succinctly, an illustrative example would aid understanding of these points. (Michael Mastrandrea, IPCC WGII TSU)	Have expanded discussion slightly - will add in later section
308	52959	2	9	1	9	1	Where in the report? (Kristie L. Ebi, IPCC WGII TSU)	Phrase omitted - best to say it here
309	42472	2	9	1	9	9	Good discussions (Shahbaz Mushtaq, University of Southern Queensland)	Thanks
310	43870	2	9	5	0	0	Section 2.2.1.4: It is not clear why this section focuses on only three types of uncertainty when in pervious sections the authors have acknowledged many others such as unpredictable changes in preferences and therefore 'goal uncertainty' and uncertainties caused by language and miscommuncation, etc. Why not mention here how these are dealt with? If this section is purely focused on those uncertainties in climate, natural and economic variables (states of the world) then this should be indicated in the title of this sub-section. (Russell Wise, CSIRO)	This has not been done properly and will be in next draft
311	43869	2	9	5	9	5	This is the first time the term "mental models" is referred to. It is probably worth defining it and/or providing a reference. If you consider using a reference, the following might be helpful: Jones, N.A., Ross, H., Lynam, T., Perez, P., and Leitch, A. 2011. Mental models: an interdisciplinary synthesis of theory and methods. Ecology and Society 16 (1): 46. [online] URL: http://www.ecologyandsociety.org/vol16/iss1/art46/. (Russell Wise, CSIRO)	Have not done this, but will consider definition and brief summary of mental/conceptual models in next draft - limited space though
312	36921	2	9	5	9	5	Wind speads are not generally increasing, only peak wind speeds might increase. Generally wind speeds decrease (see page 8, line 24 to 25). (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	We explain how a predict-then-act and an assess-risk-of-policy approaches deal with uncertainty; due to space constraints we can't explain the methods in detail
313	45699	2	9	6	9	7	...communicating what they think they are.' - or may be of limited value / relevance to decision makers (Roger Street, UK Climate Impacts Programme)	this sentence has been removed
314	49438	2	9	10	0	0	Clarify how uncertainty can be managed and incorporated on CCIAV (section 2.2.1.4) (Fabiola S. Sosa-Rodriguez, University of Waterloo)	thanks
315	47465	2	9	12	9	12	Here we disregard..': If you do so, you should mention at least once that most likely a lot of axiomatic consistency is sacrificed, at least it is at present not easy to re-establish it for Knightian uncertainty. If desired, I can provide targeted literature. (Hermann Held, University of Hamburg)	we have reduced the emphasis on Knight

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
316	43694	2	9	12	9	19	Congratulations on bringing in the definitions of aleatory and epistemic uncertainty which, for some reason, the IPCC definitions of likelihood and confidence usually seem to ignore. (Martin Manning, Victoria University of Wellington)	due to space constraints this has been removed
317	47963	2	9	12	9	19	It is not necessary to highlight the Knight's conceptualisation of uncertainty and risk. In light of the huge body dedicated to the topic , it seems to me superfluous to highlight the departure from by now such outdated concept (Jaroslav Mysiak, Fondazione Eni Enrico Mattei; and Euro-Mediteranean Center for Climate Change)	several references have been inserted
318	48728	2	9	12	9	19	This leaves out a few major categories of uncertainty (e.g. uncertainty about values and linguistic uncertainty). Would be good to include them, and to include some mention of the differences in how one quantifies aleatory and epistemic uncertainty vs. linguistic uncertainty or uncertainty about values and objectives. (Jennifer Hoffman, EcoAdapt)	we don't go into the details of how to estimate likelihood in the chapter
319	49969	2	9	12	9	28	It would be preferable to provide further background citations supporting these statements. (Katharine Mach, IPCC WGII TSU)	Text altered significantly
320	48251	2	9	14	2	14	"Likelihood" should not be estimated in Bayesian techniques alone, but also using Maximum Likelihood estimate (Malini Nair, Indian Institute of Science)	Level of detail we don't enter into
321	48504	2	9	14	9	18	I find that a lot of difficult philosophical territory is covered in very short space such that it is almost more confusing than illuminating. (In my comment on Chapter 2, Page 8, Line 31-32 I mentioned some literature I find helpful on this topic). (Dominic Roser, University of Zurich, University of Graz)	This text has been omitted
322	35600	2	9	16	0	0	Ayyub and Klir (2006) offer a complete definition of ignorance using an ignorance hierarchical structure (see Figure 1-19 of this reference). Ayyub, B. M., and Klir, G. J., Uncertainty Modeling and Analysis in Engineering and the Sciences, Chapman & Hall/CRC, Press Boca Raton, FL, 2006. (Bilal Ayyub, University of Maryland)	Kahnemann citation introduced
323	35601	2	9	16	0	0	The work of Ayyub and Klir (e.g. Ayyub and Klir 2006, Klir 2005, Ayyub 2010) should be cited in this section. Ayyub, B. M., "On Uncertainty in Information and Ignorance in Knowledge," J. General Systems, 39(4), May 2010, 415-435. (Bilal Ayyub, University of Maryland)	citations have been introduced
324	52455	2	9	21	0	0	Paragraph comment: missing citations from Khaneman and Tversky (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	done
325	47727	2	9	21	9	36	Need citations here "The literature emphasizes..." but no citations are provided. Similarly, broad conclusions are drawn in both of these paragraphs but no citations are provided. (Eric Toman, The Ohio State University)	noted
326	45700	2	9	22	9	22	...information necessary to adjudicated tradeoffs and conflicts' (Roger Street, UK Climate Impacts Programme)	comment out of place
327	48054	2	9	22	9	25	An example is the UKCP09 projections (Murphy et al., 2009) where the uncertainty bands could be (incorrectly) perceived as describing all uncertainties (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Text significantly altered
328	36922	2	9	23	9	23	The increase of heat waves is somehow likely, the increase of droughts and heavy precipitation only in some parts of Europe. There strong differences in drought definitions, see also SREX (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
329	48891	2	9	23	9	24	the discussion of 'cognitive challenges' might include interpretational plurality (van Asselt, 2005, Int J Risk Assess, 5, 2/3/4, 125-158) (Leon Soste, Department of Primary Industries, Victoria, Australia)	Sentence has been removed
330	48055	2	9	25	9	25	Uncertainty aversion also where there is ambiguity over the sign of change (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	sentence has been removed
331	45701	2	9	32	9	36	Suggest also looking at http://www.india-seminar.com/2009/597/597_andy_stirling.htm on Risk, uncertainty and power (Roger Street, UK Climate Impacts Programme)	sentence has been removed
332	47728	2	9	33	9	33	Avoid the use of the term "Uncertainty" here as it is being used as a distinct, defined concept in this section. (Eric Toman, The Ohio State University)	is it in the glossary?
333	54164	2	9	33	9	36	"Uncertainty" over which approach to use to deal with uncertainty could be confusing. Could a different word be used here? (Michael Mastrandrea, IPCC WGII TSU)	sentence has been removed
334	47729	2	9	38	9	52	Undefined jargon here (e.g., joint probability density function) - I'm concerned that we could lose our audience here (Eric Toman, The Ohio State University)	there isn't enough space to discuss this
335	47213	2	9	40	9	42	Inaccurate definition of the Bayesian analysis. The frequentist analysis is a subset of the Bayesian analysis. In no way the bayesian analysis prevents using frequentist analysis (Diane Chaumont, Ouranos)	sentence has been removed
336	54165	2	9	40	9	42	It would be valuable to elaborate a bit about how frequentist estimates can apply to characterizing future states of the world, which cannot be observed repeatedly. How can such frequentist estimates inform estimates of future outcomes, however? (Michael Mastrandrea, IPCC WGII TSU)	this section's second paragraph now addresses this
337	52456	2	9	41	9	42	Comment: Definitions of frequentist and Bayesian approaches are a gross oversimplification, particularly the description of Baysian approaches which lacks the recognition for updating given new data or model predictions. There is also a lack citations for these definitions. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	sentence has been removed
338	52457	2	9	41	9	42	Comment: It is also important to discuss when these approaches are appropriate because the weight of the discussion is on this deep uncertainty and the need for other approaches, which may be true in some cases, but in other cases probability distributions and such probabilistic analyses are appropriate because the uncertainties can be characterized with distributions and the value of information of increased scientific precision is low for a particular decision context. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	sentence has been removed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
339	40696	2	9	41	9	42	I do not quite agree with the definition given for Bayesian probability estimates. In fact, there are two major Bayesian schools: subjective Bayesianism and objective Bayesianism. Only subjective Bayesians use subjective judgments as an input (and, often, not the only input). What all Bayesians have in common is the interpretation of “probability” as plausibility, whether or not it can be associated to a frequency, while, for frequentists, “probability” is the frequency in an asymptotically large sample. For example, when the AR4 states that there is a probability >0.9 that recent global warming is mostly due to the observed increase in anthropogenic greenhouse gas concentrations, this is clearly a “probability” in the Bayesian sense but not in the frequentist sense, because there is no way to identify it with a frequency. A different topic is how the degree of plausibility is decided. In this case the probability (plausibility) was assigned by expert judgment, in the subjective Bayesian way. In contrast, objective Bayesians apply standardized methods to determine probabilities (plausibilities) just as a function of the available data and the type of problem, without expert elicitation. You can find a more extended explanation and references in a recent paper where I developed an objective Bayesian framework for the estimation of climate sensitivity (Pueyo 2012, Climatic Change 113:163–179). (Salvador Pueyo, Institut Català de Ciències del Clima (IC3))	sentence has been removed
340	52960	2	9	41	9	42	The definition of Bayesian is not that is derives from subjective estimates. (Kristie L. Ebi, IPCC WGII TSU)	paragraph has been changed
341	43871	2	9	44	9	44	It is not true to state that "these approaches, however, do not explicity address any imprecision or deep uncertainty". Bayesian belief network (BEM) approaches are all about dealing with this type of uncertainty. (Russell Wise, CSIRO)	Table removed
342	47214	2	9	44	9	52	I think the paragraph reveals a misunderstanding of the nature of probabilities (Diane Chaumont, Ouranos)	Table removed
343	39143	2	9	44	9	52	This paragraph is very technical and its relevance to climate change issues is not made clear. I doubt that many people would get something out of this without first reading the literature you cite. (Thomas Reuter, University of Melbourne)	Table removed
344	48729	2	10	0	0	0	In reference to Table 2.1 and associated text: Not sure what the point is here. Seems to ignore response models other than hydrological (other possibilities include population-based or vegetation response models, as well as human response models) (Jennifer Hoffman, EcoAdapt)	Table removed
345	52458	2	10	0	0	0	Table 2.1: The numbers that are used within the table are completely confusing. What does 4 mean? It isn’t defined in the caption. Also I’m not sure if all the acronyms used in the table were previously defined. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Table removed
346	42287	2	10	1	10	1	"others" to be "other" (Luhui Yan, Tanzuji)	Text removed
347	47730	2	10	1	10	11	More jargon here. Perhaps include a table that summarizes and contrasts the different approaches. I would avoid describing scenarios as explicitly engaging "decision makers' imaginations", which makes it sound as if the projections will have no basis in data regarding potential future conditions. (Eric Toman, The Ohio State University)	this paragraph has been removed due to space constraints
348	47466	2	10	1	10	11	The contrast that is made up to the previous § does not apply in several cases. Quite the contrary, several examples gives seem to be fine examples of imprecise probabilities. In particular the cited intervals of probabilities along Mastrandrea et al 2010 can be interpreted as such. The same seems to hold for Hansen and Sargent, 2008, to my taste. Finally, it might be helpful to mention that scenarios also represent some scanning of the uncertainty space, however, without a formal, but with a more intuitive measure. (Hermann Held, University of Hamburg)	this paragraph has been removed due to space constraints
349	47659	2	10	13	10	30	It may be worth to shortly describe the impact response surface approach (which have also been mentioned in TAR-Ch. 3 and AR4-Ch.2) for which several new case studies have recently been published in a special issue of NHESS (http://www.nat-hazards-earth-syst-sci.net/special_issue103.html). In this issue, Ferrise et al., Weiss, Wetterhall et al., Børgesen and Olesen and Fronzek et al. present examples of impact response surfaces from various sectors and combine these with a comprehensive probabilistic projection of climate change. Fronzek et al. (doi:10.5194/nhess-11-2981-2011) also quantify impact model uncertainty in their response surfaces. (Stefan Fronzek, Finnish Environment Institute)	this paragraph has been removed due to space constraints

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
350	49875	2	10	16	10	26	A number of authors have recently tried to extend methods of applying probabilistic climate information into various sectoral impact studies in a series of papers out of the EU ENSEMBLES project: Børgesen, C.D. and J.E. Olesen, 2011: A probabilistic assessment of climate change impacts on yield and nitrogen leaching from winter wheat in Denmark. Natural Hazards and Earth System Science, 11, 2541-2553. doi:10.5194/nhess-11-2541-2011; Ferrise, R., M. Moriondo and M. Bindi, 2011: Probabilistic assessments of climate change impacts on durum wheat in the Mediterranean region. Natural Hazards and Earth System Science, 11, 1293-1302. doi:10.5194/nhess-11-1293-2011; Wetterhall, F., L.P. Graham, J. Andréasson, J. Rosberg and W. Yang, 2011: Using ensemble climate projections to assess probabilistic hydrological change in the Nordic region. Natural Hazards and Earth System Science, 11, 2295-2306. doi:10.5194/nhess-11-2295-2011; Weiß, M., 2011: Future water availability in selected European catchments: a probabilistic assessment of seasonal flows under the IPCC A1B emission scenario using response surfaces. Natural Hazards and Earth System Science, 11, 2163-2171. doi:10.5194/nhess-11-2163-2011. The methods presented are similar to those advocated by Roger Jones over a decade ago, but now with rather more robust climate projections than were available to Roger (at least, more comprehensive in their analysis of all available evidence). All papers use the probabiistic climate projections developed for Europe by Harris, G.R., M. Collins, D.M.H. Sexton, J.M. Murphy and B.B.B. Booth, 2010: Probabilistic projections for 21st century European climate. Natural Hazards and Earth System Science, 10, 2009-2020. doi:10.5194/nhess-10-2009-2010. A further paper also attempts to combine probabilistic climate projections with estimates of impact model uncertainties: Fronzek, S., T.R. Carter and M. Luoto, 2011: Evaluating sources of uncertainty in modelling the impact of probabilistic climate change on sub-arctic palsa mires. Natural Hazards and Earth System Science, 11, 2981-2995. doi:10.5194/nhess-11-2981-2011, which is a follow-up paper to an earlier exploration of applying probabilistic climate information from a different (non-ENSEMBLES) source: Fronzek, S. and T.R. Carter, 2007: Assessing uncertainties in climate change impacts on resource potential for Europe based on projections from RCMs and GCMs. Climatic Change, 81 (Suppl. 1), 357–371. One motivation for addressing impact model uncertainties is the poor representation of uncertainty analysis in model-based studies, where unceretainties in projections are commonly a function of climate uncertainties alone, when in fact there are strong arguments for employing equivalent rigour to model testing and analysis for impact models (e.g. by exploring structural and parameter uncertainties through multi-model ensembles and uncertainty analysis) as has become the norm for climate models. An example of this reasoning for crop models is found in: Rötter, R.P., Carter, T.R., Olesen, J.E. and Porter, J.R. 2011. Crop–climate models need an overhaul. Nature Climate Change 1: 175-177. (Timothy Carter, Finnish Environment Institute)	this paragraph has been removed due to space constraints
351	53858	2	10	19	10	20	unclear what 'upstream' and 'downstream' means (Stephan Lewandowsky, University of Western Australia)	this paragraph has been removed due to space constraints
352	54166	2	10	21	10	23	Over what time frame is this statement meant? Scenario uncertainty becomes important as the time horizon increases. (Michael Mastrandrea, IPCC WGII TSU)	Text removed
353	49970	2	10	24	10	24	Could these adaptation scenarios be indicated within table 2-1? (Katharine Mach, IPCC WGII TSU)	Table 1 deleted
354	52459	2	10	32	0	0	Remainder of Sub-Section: It seems as if the authors have a preference for a particular type of approach given the amount of space devoted to discussing one over the other. There are good reasons for presenting uncertainty for a wide range of decisions and good reasons for presenting the decision-relevant uncertainties. One is not better than the other; different information or decision situations may prefer one over the other. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	this needs to be done - better representation of uncertainty in next version
355	42623	2	10	32	11	7	It is unclear how these two ways of organizing uncertainty and interacting with decision-makers relate to the Figure 2-2. Both are cited as falling within the "identify options, assess risks, evaluate tradeoffs loop", and it is hard to see how any decision-making process could avoid that loop. The figure does not clarify the text. (Erin Coughlan, Red Cross / Red Crescent Climate Centre)	text has been improved around the figure
356	54695	2	10	35	0	0	The figure requires the 2a features to be explicitly added in the figure. (Monalisa Chatterjee, IPCC WGII TSU)	N/A
357	49971	2	10	35	10	46	Given that the descriptions of the 2 contrasting approaches on lines 35 and 46 seem quite similar, it would be helpful to clarify the difference. Are they distinguished by differing starting points, for example? (Katharine Mach, IPCC WGII TSU)	No. This is better addressed in 2.3.1.
358	36923	2	10	41	10	48	This paragraph states correctly that data on drought trends in Europe are very inconsistent. Therefore earlier statements on increaes of droughts in Europe should be corrected accordingly. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
359	43872	2	10	44	10	44	An important additional aspect of these alternative approaches worth mentioning is that of the "values-based approaches" which emphasise the importance of recognising and trying to accommodate the fact that people's values and preferences are not constant and are likely to be radically different from todays. See O'brien and Wolf (2010) for example: O'Brien, K.L. and Wolf, J. 2010. A values-based approach to vulnerability and adaptation to climate change. Wiley Interdisciplinary Reviews: Climate Change 1 (2): 232-242. (Russell Wise, CSIRO)	This is dealt with in section 2.2 and this reference used quite a bit.
360	52961	2	10	44	10	52	I couldn't figure out why this wasn't an example of describing uncertainty as distinct information. (Kristie L. Ebi, IPCC WGII TSU)	thanks, text amended
361	48056	2	10	44	10	52	The Thames Estuary 2100 project is a seminal example of this. A water resource example for London is in Darch et al. 2011 - Water Resource Planning under Climate Uncertainty in London - research for the UK Adaptation Sub Committee (see http://downloads.theccc.org.uk.s3.amazonaws.com/ASC%202nd%20Report/ASC-Water-CaseStudy_Final.pdf) (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	space constraints preclude using this, though we have discussed it
362	52460	2	11	0	0	0	Nice discussion of process- vs. outcome-based criteria. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Thanks
363	52962	2	11	1	11	7	You could add some discussion of the issues with path dependencies. (Kristie L. Ebi, IPCC WGII TSU)	Need to do this better - implicit at present

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
364	49439	2	11	10	0	0	How 'process- and outcome-based' criteria can be integrated into CCIAV (section 2.2.1.5) (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Discussion has been strengthened
365	43873	2	11	10	0	0	Section 2.2.1.5.: This section doesn't seem to adequately address the issue of how we measure and evaluate changes in institutions, organisations, and governance arrangements more broadly. I think it may help by being more explicit about the types of options/actions that are more amenable to the various types of criteria. This discussion could then explore how to evaluate tradeoffs between options that have immediate outcomes compared with those that have delayed outcomes and how to evaluate tradeoffs between 'soft' (behavioural and institutional) and 'hard' (infrastructure) options. (Russell Wise, CSIRO)	We have developed this theme somewhat
366	46685	2	11	10	0	0	Section 2.2.1.5: Experiences/cases from the NAPA and other Screening exercises for selection of adaptation options through evaluation and trade-offs can be mentioned in this section for a better clarity of the arguments. (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	We use some of the examples later
367	40881	2	11	10	0	0	Tradeoffs in this context assumes (and promotes) siloing of both information and processes in CCIAV decision making. This section title and frame assumes mutual exclusivity under traditional theories. Showing the progression and dominance of this is important but adding clear direction and the scholarship to support the emerging theme of integration is important in showing how the field is evolving past mutual exclusivity, inclusion of data types that have not fit traditional measurements in decision structuring proceses etc. (See my comment for page 8, line 7) (Lynn Wilson, SeaTrust Institute)	Discussion is better focussed round these points
368	36924	2	11	10	11	17	Future floods threaten human settlements in flood prone areas, this is correct. But it should be added that there has been a very strong development of settlements in flood prone areas, both riverine and coastal. An analysis of settlement increases in coastal flood prone areas, and consequent adaptation can be found from: Schmidt-Thomé, P., Klein, J. 2011. Applying Climate Change Adaptation in Spatial Planning Processes. In: Schernewski, G., Hofstede, J., Neumann, T. (eds): Global Change and Baltic Coastal Zones, Coastal Research Library-Series, Springer, Dordrecht, Vol. 1, pp 177-192. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
369	36925	2	11	15	11	15	Europe faces an overall population decrease, not growth. Population increase is noted in flood prone and other hazardous areas, see for example Schmidt-Thomé, P., Klein, J. 2011. Applying Climate Change Adaptation in Spatial Planning Processes. In: Schernewski, G., Hofstede, J., Neumann, T. (eds): Global Change and Baltic Coastal Zones, Coastal Research Library-Series, Springer, Dordrecht, Vol. 1, pp 177-192. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
370	48490	2	11	18	11	19	This is a very narrow and non-standard view of rights-based theories. Prominent theorists in this area -- such as Amartya Sen, Henry Shue, and Simon Caney -- have proposed theories in which the fulfilment of rights amounts also to an outcome and not only to a process. Note that the same is true of how we speak of rights in our everyday language. (Dominic Roser, University of Zurich, University of Graz)	This is implicit in this discussion - the point being here that the process develops the outcome - it is not proposed a priori then a process developed to achieve that
371	41875	2	11	18	11	53	Because the order of "outcome-based" and "process-based" mentioned in the paragraph of L18-22 is in this order, the order of the paragraph of L24-38 and that of L40-53 should be exchanged. (Hiroaki Kondo, National Institute of Advanced Industrial Science and Technology (AIST))	Have not done this - don't think it is that important
372	35824	2	11	24	0	38	This discussion focuses only on deliberation as a social psychological process that takes place in small groups. This ignores the highly developed empirical literature about the role of deliberation in democratic societies, and the role of the structure of government institutions in shaping public deliberation at the national level. This literature shows how democratic deliberation is systematically distorted and allows certain elites to continue to pursue their narrow interests, to the detriment of the public good, including allowing the acceleration of climate change. This literature is very well developed in both political science and sociology, and I feel it should be integrated into the discussion. See the following references as an entry point into this literature: Brulle, Robert J. 2000. Agency, Democracy, and Nature, MIT Press, Chapters 2-4 Habermas, Jürgen. 1996. Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy. MIT Press. (Robert Brulle, Drexel University)	We have added more in the chapter on organisational decision-making and will strengthen this greatly in the next draft
373	47964	2	11	24	11	30	The distinction between outcome and process based decision criteria is somewhat confused in particular through a choice of misleading examples. The latter guarantee or certify the quality of the decision processes, rather then distinguishing the alternative courses of actions. (Jaroslav Mysiak, Fondazione Eni Enrico Mattei; and Euro-Mediteranean Center for Climate Change)	Text not changed greatly
374	48491	2	11	24	11	38	A core example of a legitimate process is missing from the list of examples in this paragraph: garden-variety democratic decision-making. (Dominic Roser, University of Zurich, University of Graz)	While it is not mentioed here (in the trade-off sense), this is embedded in section 2.3.1 and is also emphasised in examples
375	49972	2	11	24	11	53	It would be preferable to provide further citations (for example, to background sources or reviews or to relevant examples) for statements made in these paragraphs. (Katharine Mach, IPCC WGII TSU)	References are with specific examples - can add more later
376	52963	2	11	24	11	53	These paragraphs can use some references. (Kristie L. Ebi, IPCC WGII TSU)	See above
377	36927	2	11	31	11	31	The postulated high damage costs for the Netherlands from coastal flooding should be revised. Information received from the Netherland Environmental Assessment Agency is that the Dutch coastal protection system is strong enough to withstand slr and flood scenarios of the A2 SRES for the next 200-300 years. The problem in the Netherlands are not the coastal but the river floods, these may certainly cause increasing costs. Costs for coastal protection are for maintenance of the current protection system. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
378	46945	2	11	32	11	34	Some religious traditions regard system-wide outcomes as beyond human understanding or control, and thus emphasize individual codes of conduct and de-emphasize attempts to adjudicate broad social trade-offs.' This should be expanded to be clear or at least referenced. (Mark Charlesworth, Keele University)	Text has been omitted - not the best decision here I think
379	53859	2	11	34	0	0	should 'ethnical' be 'ethical'? (Stephan Lewandowsky, University of Western Australia)	Corrected

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
380	46946	2	11	34	11	24	Some utilitarian-based ethnical - Presumably should be 'ethical' (Mark Charlesworth, Keele University)	Corrected
381	48492	2	11	34	11	34	Typo: ethnic instead of ethic (Dominic Roser, University of Zurich, University of Graz)	Corrected
382	54167	2	11	35	11	48	Could citations to examples of these methods be added here as done below? (Michael Mastrandrea, IPCC WGII TSU)	Not done
383	36928	2	11	37	11	39	You may like to add here that climate change adaptation investments have already been made in some regions, especially in order to safeguard new settlements in coastal flood prone areas. Examples can be found from the Baltic Sea Region (Finland and Lithuania), see Schmidt-Thomé, P; Klein, J.; Satkunas, J. 2010. Climate change, impacts and adaptation – some examples of geoscience applications for better environmental management in the Baltic SeaRegion. Episodes, 33/2, 102-108. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
384	48493	2	11	40	11	40	Whether one argues for using outcome-based criteria or process-based criteria does not only depend on whether the decision process is well structured. It also depends on the moral and political values one espouses. In democracies, many decisions are taken on the basis of a legitimate democratic procedure EVEN IF the decision structure is so simple as to allow outcome-based evaluation. (Dominic Roser, University of Zurich, University of Graz)	True.
385	43051	2	11	40	12	15	The list of methods covered focuses on methods that have been used most frequently used in a climate context, but not some of the methods that are routinely used in natural resource management and are beginning to be used for climate work. For example Management Startegy Evaluation is a participatory method (thus accessing knowledge on many competing objectives) that models all steps of the adaptive management cycle (and its uncertainties). It has been repeatedly used to highlight tradeoffs in complex system and management circumstances - particularly in fisheries, but also multiple use marine management and increasing onland too. Relevant references include: de la Mare, W. K. 1998. Tidier fisheries management requires a new MOP (management oriented paradigm). Reviews in Fish Biology and Fisheries 8:349-56. Sainsbury, K. J., A. E. Punt, et al. (2000). "Design of operational management strategies for achieving fishery ecosystem objectives." ICES Journal of Marine Science 57(3): 731-741 Butterworth, D. S., Bentley, N., De Oliveira, J. A. A., Donovan, G. P., Kell, L. T., Parma, A. M., Punt, A. E., Sainsbury, K. J., Smith, A. D. M., and Stokes, T. K. 2010. Purported flaws in management strategy evaluation: basic problems or misinterpretations? – ICES Journal of Marine Science, 67: 567–574. (Beth Fulton, CSIRO Marine and Atmospheric Research)	We need to look into these to see whether they are really different, or the same horse of a different colour.
386	43052	2	11	40	12	15	There is also the Viability analysis method that has been extended from consideration of population vaiability to the vaiability of stated objectives given the existing state of the system - for an example see: J.-C. Pereau L. Doyen, L.R. Little, O. Thebaud (2011) The triple bottom line: Meeting ecological, economic and social goals with individual transferable quotas. Journal of Environmental Economics and Management 63 (2012) 419–434 (Beth Fulton, CSIRO Marine and Atmospheric Research)	We need to look into these to see whether they are really different, or the same horse of a different colour.
387	48494	2	11	41	11	44	This is in my view the most controversial sentence of chapter 2. I assume that for most theorists (and for most people on the street), optimality according to von Neumann-Morgenstern Expected Utility Theory is NOT the best possible choice EVEN IF costs and benefits can be quantified according to a common metric. There are premises implicit in expected utility theory that are contrary to what most people consider sound decision-making; for example the view that all outcomes ought simply to be weighted by their probability (in that way, a certain probability of violating basic rights can simply be weighed up by a certain probability of achieving a very good outcome -- in fact, expected utility theory might not even be able to conceptualize the idea of rights in a satisfactory way). Also, most people consider the distribution of costs and benefits crucial and nothing in that criterion tells us how that ought to be judged. (Special care must be given when we move from generic expected utility theory to the more specific criteria of cost-benefit analysis. The aggregation involved in cost-benefit analysis rests on even less widely shared presuppositions). (Dominic Roser, University of Zurich, University of Graz)	This is not the most controversial statement, and the constraints here are highly conditional. The cases put in this comment to argue against this statement are not cases within these bounds. In any case, the statement has been watered down and is later characterised in terms of different strategies.
388	41149	2	11	42	0	0	Section 2.2.1.5 Pg11 line 42- There is a disproportionate emphasis in this chapter on the benefits of optimality in decision making. The limitations to this type of decision-making, especially in light of managing dynamic human and natural (social-ecological) systems should also be included in this section so as not to give the impression it is considered to be the best approach in the literature. Walker and Salt, 2006 (see full reference below) indicate optimality is not reasonable to strive for in systems that are dynamic, as optimization can result in a reduction of resilience (eliminates redundancies, over simplifies values, and narrows the range of the boundaries governing a system). Instead they emphasizes the utility of applying resilience thinking to manage social-ecological systems (SES) - “The key to sustainability lies in enhancing the resilience of SES, not in optimizing isolated components of the system” (Walker and Salt, 2006). Acceptance of change, and making decisions in a framework that enables navigating through this change, enhances the ability of SES to continually adapt through cycles of change. Unlike optimality, resilience thinking acknowledges that there are multiple stable states of a system, that systems are dynamic, and constantly changing over time. Although resilience thinking is highlighted in Chapter 20 of the AR5 WGII FOD, I think it necessary to include it in this section of Ch 2 to present a balanced discussion. An elaboration, similar to that done for the concept of robustness (Pg 12 paragraph 2) would help to strengthen this section. Walker, B. and D. Salt. 2006. Resilience Thinking: Sustaining ecosystems and people in a changing world. Island Press, Washington. (Susan Evans, WWF-Canada)	This wasn't intentional and has been redressed in this draft. Section 2.4.2 is also on resilience conistent with chapter 20
389	48730	2	12	0	13	0	2.2.1.6, Scenarios: Would be good to include more in here about how to use scenarios in decision-making. All this text on types of scenarios and sources of scenarios needs to be strongly placed in the decision-making context. This chapter doesn’t mention scenario planning or scenario-based planning at all! (Jennifer Hoffman, EcoAdapt)	We have clarified this somewhat in a shorter and tighter section

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
390	52461	2	12	1	0	0	Paragraph Comment: It seems like the satisfcing principal also comes into play here because decisions given the optimal outcome choice is not always made because the analysis to determine such a decision may be more intense than picking a decision that meets the minimum criteria, which seems to have been discussed in the line 17 paragraph in the context of robustness. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Noted
391	36929	2	12	3	12	4	Why this statement so late in the text? It would be preferable to place it in the beginning of chapter 23, even also in the beginning of chapter 1 in order to indicate that it is not only climate change but especially human vulnerabilities that make (immediate) action on adaptation necessary. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
392	49973	2	12	4	12	4	"high confidence" -- If being used as calibrated uncertainty language per the guidance for authors, this phrase should be italicized. Casual usage of the reserve phrase should be avoided. (Katharine Mach, IPCC WGII TSU)	Noted
393	52964	2	12	8	12	8	This assumes the "worst case" is known, which is highly unlikely. (Kristie L. Ebi, IPCC WGII TSU)	Noted
394	47731	2	12	17	12	32	The discussion of robustness is good, but a similalrly brief discussion of resliences is needed here. (Eric Toman, The Ohio State University)	That is the role of 2.4.2. Need to add pointer to that section (not done)
395	41150	2	12	18	12	21	Section 2.2.1.5 Pg 12 line 18-21 - The concept of resilience can also be applied to describe the state of a system, 'resilient', and thus would also be a property of the decision itself – a resilient decision could be one that is capable of maintaining function or a particular value under a variety of climate scenarios. (Susan Evans, WWF-Canada)	Noted
396	36930	2	12	25	12	25	"increase in stability"? (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
397	52965	2	12	28	12	28	I suggest defining satisficing, or providing an example. (Kristie L. Ebi, IPCC WGII TSU)	Not done, but we may, or omit
398	47732	2	12	32	12	34	A transition is needed between these paragraphs. (Eric Toman, The Ohio State University)	Latter para removed
399	49974	2	12	36	12	37	It would be helpful to specify what the "1st 4 steps" are in figure 2-2. (Katharine Mach, IPCC WGII TSU)	Para removed
400	40882	2	12	38	0	0	It would add strength to cite examples of "participatory methods designed for these purposes." (Lynn Wilson, SeaTrust Institute)	Para removed
401	52966	2	12	40	12	42	This could be a key finding. (Kristie L. Ebi, IPCC WGII TSU)	Sentence removed. This needs to be revisited.
402	47215	2	12	45	0	0	Ouranos, in Québec, Canada, has 10 years of experience in the development, the transfer and the communication of climate scenario to decision-makers. Huard et al are presently working on a publication relating their experience. If you are interested, we will send a copy, this could be relevant for this section. (Diane Chaumont, Ouranos)	Please supply the reference
403	35507	2	12	45	14	19	I suggest that the authors give some consideration to the work of the Global Scenario Group (Gallopin et al. 1997). Drawing on earlier work of the Group, Allen Hammond (1998:22-61) delineates three possible future scenarios: (1) Market World, (2) Fortress World, and (3) Transformed World. In its later work, the Global Scenario Group refined its scheme to include three possible future scenarios for humanity with respect to the crisis of ecological sustainability: (1) Conventional World. (2) Barbarization, and (3) Great Transitions, with the later being divided into Eco-Communalism and the New Sustainability Paradigm. Peter F. Sale (2011) has recently delineated four future scenarios for humanity, which he calls Belvedere, Woodstock, Technopolis, and New Atlantis. (Hans Baer, University of Melbourne)	We do not have room for a discussion of the history of global scenario development
404	48892	2	12	45	14	19	section 2.2.1.6 scenarios - may wish to consider a rewrite. The benefits / key messages don't come across coherently, particularly (at an operational level) the contribution of scenarios in assisting with reperceiving reality (Wack 1985a,b in refs) (Leon Soste, Department of Primary Industries, Victoria, Australia)	Have tightened the section but will need further work in this regard
405	41151	2	12	47	0	0	Section 2.2.1.6 Pg12 line 47 - first sentence is awkward, and doesn't seem to be complete. (Susan Evans, WWF-Canada)	Comma removed - may need more work
406	43874	2	12	47	12	47	Poorly worded sentence. It is unclear what this means? (Russell Wise, CSIRO)	Comma removed - may need more work
407	47467	2	12	47	12	54	Given the previous §'s I do not find this characterization of 'scenarios' very consistent. It is not wrong, and it is a common mantra, but the same would hold for a full-fledged uncertainty analysis as well. The mere difference is that scenarios are lacking a formal uncertainty measure. (Hermann Held, University of Hamburg)	Don't fully agree - internal consistency is also a property that may not exist in uncertainty analysis
408	49975	2	12	48	12	48	"very high confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. (Katharine Mach, IPCC WGII TSU)	Done
409	52127	2	12	48	12	50	In providing a definition of "scenario" here, the chapter team could also consider cross-referencing the definition in the report glossary. (Katharine Mach, IPCC WGII TSU)	Not done
410	36931	2	12	48	25	48	This statement is contradictory to earlier one's. Also SREX does not state this. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
411	45703	2	12	50	12	54	Note that scenario use originated outside of climate (Roger Street, UK Climate Impacts Programme)	We do not have room for this
412	36932	2	13	1	13	9	For a vulnerability analysis of heat waves in urban areas please see and quote "Holsten A., & Kropp J.P.: An integrated and transferable climate change vulnerability assessment for regional application, Natural Hazards,DOI 10.1007/s11069-012-0147-z" and "Lissner T., Holsten A., Walther C., Kropp J.P. (2012): Towards sectoral and standardised vulnerability assessments: the example of heatwave impacts on human health. Climatic Change, 112, 3-4, 687-708" (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
413	54168	2	13	5	13	33	These scenario typologies could be explained in a more straightforward manner. The presentation currently jumps around somewhat and make it hard to understand the different categories. (Michael Mastrandrea, IPCC WGII TSU)	Tightened
414	45704	2	13	7	13	7	Is this not a change from the original intent of scenarios? (Roger Street, UK Climate Impacts Programme)	No - they were developed for decision-making
415	49976	2	13	17	13	17	It would be helpful to indicate in slightly greater detail what a "reflexive" scenario is. (Katharine Mach, IPCC WGII TSU)	Not done - will do next time
416	45705	2	13	17	13	46	Tabular presentation of this information would be more helpful (Roger Street, UK Climate Impacts Programme)	Will consider later

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
417	53860	2	13	25	0	0	kriegler et al reference missing (Stephan Lewandowsky, University of Western Australia)	Fixed
418	36933	2	13	26	13	26	Why increses in storms? This is contradictory to earlier statements. Also note that in Europe there are only very few, if any at all, permaferost areas below the artic circle. Permafrost areas thus do not belong to this chapter but to the chapter on the Arctic. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
419	43875	2	13	27	13	47	Instead of "determinants of scenarios" maybe use "typologies of scenarios"? (Russell Wise, CSIRO)	That doesn't make sense given the previous discussion of typologies
420	39490	2	13	35	13	46	This section is important - it might be useful to include a sentence on the kinds of models being used and the reasons they are being used. As ESMs (climate models+) and IAMs (scenario generating models) start to converge in content, resolution, and 'predicitive power', the role of quantitative scenario generation (model output) and scenario use as input (to climate models) starts to be complicated to disentangle and understand. (Sarah Cornell, Stockholm Resilience Centre)	This is so, but more a WG I or Chapter 21 concern
421	49977	2	13	37	13	37	"high confidence" -- It would be preferable to avoid casual usage of this reserved uncertainty phrase, as is possible. (Katharine Mach, IPCC WGII TSU)	Its usage here is in context and cannot be confused, given the styling of formal assessments in itatics
422	47468	2	13	43	13	43	How can they fill that gap? I do not understand it while I have some guesses what the authors intend. (Hermann Held, University of Hamburg)	The text seems explanatory
423	46686	2	13	45	13	46	An example would enrich the argument and the text (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	No, but a reference will help - possibly to another chapter
424	36934	2	13	46	13	46	It seems that the 2003 heat wave is a little bit overrated in the entire chapter. This was one extreme event and it stands as a permanent place holder for future summers and potential extreme events. This might certainly turn out to be be true, but it also might not. It is scientifically questionable to use a single event over and over again. It could thus be considered to review the entire on the use of this sibgle event. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
425	53861	2	13	49	0	0	the paper by Risbey on this issue should be cited: Risbey, J. S. Some dangers of `dangerous' climate change Climate Policy, 2006, 6, 527-536. (Stephan Lewandowsky, University of Western Australia)	Will add in next draft
426	43876	2	13	50	13	50	"peer-reviewed" is better than "expert" literature. (Russell Wise, CSIRO)	No, because we use a wider literature
427	48893	2	13	51	13	53	scenarios have the capacity to' .. AND .. 'a participatory process is likely to achieve broader agreement than expert judgement by itself' - agree entirely - links to earlier comments on co-production of knowledge (p6, lines 36/37). Suggest that policy makers are included in the participatory process so that they are convinced of the credibility, legitimacy and salience of the information (p6, line 35) and can subsequently make the necessary translations into the policy context (p25, lines 46/47). A research question lurking here is - how do policy makers use the qualitative information from participatory scenario processes to guide policy? My experience is that, even with such participation, policy makers are more comfortable with quantification (provides perception of objectivity), whereas qualitative information is regarded with caution (subjective, lack of defensibility etc). Underlying issue is - how do we validate information from different sources for policy making? (Leon Soste, Department of Primary Industries, Victoria, Australia)	This is true and we don't really deal with the quant-qual problem here - will consider next time
428	40883	2	13	53	0	0	Citation meeded to support this sentence. (Lynn Wilson, SeaTrust Institute)	Yes, but not done
429	45706	2	14	1	14	1	What aspect (related to informing decisions) can be overcome? (Roger Street, UK Climate Impacts Programme)	This sentence is self explanatory
430	45571	2	14	1	14	2	Mention the practice, under uncertainty, of running scenario ensembles through model suites - where the multi-model dimension, by adding layers of divergence and similarity, further broadens a study's analytical applicability range, as well as distinguishing model-specific effects and/or computational artefacts from physical drivers of outcomes. (Yanna Antypas, U.S. Energy Information Administration (Department of Energy))	A little applied for this chapter
431	54169	2	14	2	14	4	Please explain what "robust" means in this context. (Michael Mastrandrea, IPCC WGII TSU)	It is self explanatory
432	36935	2	14	5	14	8	This statement is most questionable. All other literature and media reports indicate that an open Northwest Passage and North East route are most interesting from economic point of views as they shorten the travel time between continents substantially. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
433	48894	2	14	8	14	9	An example of collective planning for regional irrigation under climate/non climate change is provided at http://vro.dpi.vic.gov.au/dpi/vro/gbbregn.nsf/pages/gb_lwm_fwm_irrig_futures. This example is also relevant to 2.3.6 Local Responses (p33) (Leon Soste, Department of Primary Industries, Victoria, Australia)	will cite case in 2.3.6; see comment 753
434	36936	2	14	10	14	17	Changes in air traffic are not related to climate change. Therefore this inofrmation is not relevant to this report. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
435	49876	2	14	11	14	11	Did we agree to do that? Good idea though - let's work on this in Buenos Aires. (Timothy Carter, Finnish Environment Institute)	Still incomplete - will need to consider in Bled, but space is also at a premium
436	49978	2	14	11	14	11	For this box, the author team may also wish to collaborate with chapters 1 and 19. (Katharine Mach, IPCC WGII TSU)	Ok
437	45707	2	14	13	14	14	The need for scenarios - does this only help understand the need for scenarios? Below appears to suggest more. (Roger Street, UK Climate Impacts Programme)	True, but the para is mainly about scenarios
438	53862	2	14	13	14	15	I remain unconvinced by the distinction between 'tame' and 'wicket' problems: Without specific examples and criteria this distinction achieves very little if anything. (Stephan Lewandowsky, University of Western Australia)	There is more explanation near the top of the chapter
439	43877	2	14	13	14	19	The term "tame risk" has been used already and is brought up again here. Are there really any examples of tame risk in climate change adaptation? if so, it will be worthwhile providing these as examples, so decision makers get a clearer idea the distinction and where their decision context sits within this framing. (Russell Wise, CSIRO)	This theme is developed further later on

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
440	52967	2	14	13	14	19	This could be a key finding. (Kristie L. Ebi, IPCC WGII TSU)	Will continue to develop this in the next draft
441	49979	2	14	14	14	14	"moderate confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. Additionally, presumably the author team means "medium" here instead of "moderate" to be consistent with the uncertainties guidance? (Katharine Mach, IPCC WGII TSU)	Done
442	41152	2	14	24	0	0	Section 2.2.1.7 Pg.14 line 24 - Learning is a central concept to adaptation and also emphasizes the need to be flexible in design and approach, which further emphasizes the limitation of striving for optimality. This section should be elaborated on to stress its fundamental nature to successful long-term adaptation. (Susan Evans, WWF-Canada)	This is a theme developed through the chapter and has been strengthened
443	48895	2	14	27	0	0	learning is fundamental' - highlights the importance of a learning culture being fostered within institutions (Leon Soste, Department of Primary Industries, Victoria, Australia)	Yes.
444	47469	2	14	36	14	36	Maybe it helps to mention that Nordhaus is using EUmax. I do not see how the real options theory can add anything to that - my impression is that it rather can be interpreted as an approximation of EUmax. (Hermann Held, University of Hamburg)	Not sure this would help
445	53863	2	14	37	14	51	What is the relevance of decision-making strategies in finance, which try to optimize a path in response to short-term fluctuations, when the climate system has lags that prevent an action from having a visible effect for decades or more? I am concerned that this presents policy makers and the public with the incorrect impression that choices can be delayed, and that delayed choices may nonetheless be effective. (Stephan Lewandowsky, University of Western Australia)	This misunderstands the role of real options in a long-term context. We will review with respect to Chapter 17 and revisit in the next draft
446	47470	2	14	41	14	41	What does 'control theory' mean here? In some sense, any decision under uncertainty is control theory. Funke & Paetz are using EUmax in combination with MaxMin, hence some robust control approach. (Hermann Held, University of Hamburg)	Don't agree with the first part of the comment (not all decisions are control theory) but the latter point is well taken. However, we can't do much more than list different methods here.
447	43053	2	14	51	14	52	Actually that definitions is only "active adaptive" management. It is also possible to have passive adaptive management where lessons are learnt from how well a management action mets objectives without a specific experiment being used. (Beth Fulton, CSIRO Marine and Atmospheric Research)	Yes, but this sense is rarely used. Clarified in the draft.
448	43054	2	14	53	15	2	Management startegy evaluation could be seen as a subset of this type of learning (Beth Fulton, CSIRO Marine and Atmospheric Research)	Text removed but sense kept
449	43879	2	15	0	0	0	Section 2.2.2.: I found it surprising that there was no mention of the political, economic and planning path-depedencies associated existing institutional arrangements and how difficult it is to alter these. (Russell Wise, CSIRO)	Needed in next draft
450	35815	2	15	0	0	0	Section 2.2.2.1 This section neglects to address corporations and financial institutions as decision makers that play a major role in the levels of risk and adaptation or maladaptation. (Robert Brulle, Drexel University)	Yes; some changes made but further changes will be made
451	47912	2	15	0	15	0	Page 15 (top) argues that there are few successful applications of adaptive management in the literature. Clarify if this refers to the climate change literature, because there are numerous examples in other disciplines like natural resources management. (Jenny Frankel-Reed, USAID)	Don't agree that these are more than isolated cases. Need to investigate further in next draft
452	39491	2	15	4	0	0	Much more (recent) literature exists on adaptive learning and management, and it should be reviewed better here. (Sarah Cornell, Stockholm Resilience Centre)	Yep, will do
453	48731	2	15	4	15	5	The literature has come a long way since 2009 in terms of examples of adaptive management. The authors could look at, e.g., the US Department of the Interior's Adaptive Management guidance documents (the technical guide and the applicatios guide) for more discussion and examples. (Jennifer Hoffman, EcoAdapt)	See above
454	45708	2	15	4	15	7	Would be worth noting the need to consider the adaptive capacity needed to deliver adaptive management (Roger Street, UK Climate Impacts Programme)	As part of a next look, will add to Section 2.3
455	47733	2	15	4	15	11	Why is adaptive management specifically discussed at length? It may merit more discussion than the three other modes of learning described above, but the rationale for doing so should be explained. (Eric Toman, The Ohio State University)	This draft has dropped some of that rationale, but it does need to be further investigated and strenghtened
456	43055	2	15	11	0	0	While there may be few in the literature this is often because there are no perfect implementations, but positive examples can still be found that are also good examples of how flexible and on-going adaptive such management bodies need to be (e.g. GBRMPA or Australian federal fisheries) (Beth Fulton, CSIRO Marine and Atmospheric Research)	Point taken, but in the case of GBRMPA, the reef is still going to the dogs
457	49447	2	15	14	0	0	Clarify the sequence in which decisions were made and adjusted to prevent bleached coral reefs in Table 2-2, so readers can visualize the adaptive process (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Text removed
458	47913	2	15	17	0	0	Section 2.2.2 (Institutional Context) is a diffuse collection of ideas and examples related to institutions and climate change but doesn't really provide a good summary of the issues and underlying literature. * One gap is a basic description (using a typology and/or examples) of the kinds of roles institutions play in managing risk and making decisions related to climate change. * Another gap is mentioning the importance of institutions across different scales and with different functions working together effectively (for example: national tariff-setting authority of locally-managed water authorities, or national standards and data sources for local land use planning.) * An emerging body of research looks at how institutions can become more adaptive in their own operations, practices, and functions, and whether this contributes to more adaptive outcomes and better decision-making. This is not mentioned in this chapter, though it comes up briefly in ch. 15. * It is not clear why a section on M&E (2.2.2.3) is included here, as it is not directly relevant to a discussion of institutional issues. (Jenny Frankel-Reed, USAID)	Agreed. We have not yet located good literature on point 1, 2 has been improved slightly and 3 has been introduced but needs to be strenghtned. Will be looking for a typology in the literature

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
459	39492	2	15	17	18	9	This is a key section, and it would benefit from some restructuring for clarity. Page 15 line 19 - be clear about what is meant by 'institution' here at the very start (eg expand this sentence with lines 26-29). Also several syntax/typo errors in lines 25-29. The 'decision-maker' heading doesn't fit the content well. Similarly, governance - page 16 line 32 - is no longer visualised that way by many people - at least since Local Agenda 21, the multi-level, multi-player nature of governance has been recognised and actively supported by the worlds nations, to say nothing about corporatism, voluntarism, social movements, etc etc. (Sarah Cornell, Stockholm Resilience Centre)	Hve improved this but more needs to be done
460	48003	2	15	23	28	9	These sections are very well-written. The only thing missing is a more direct acknowledgment and thorough discussion of issues related to information scale versus decision scale, and the barriers that institutions face in providing decision support at the scale(s) of decision-making (and vice-versa, i.e the difficulty that decision-makers face in acquiring decision support at relevant scales). That discussion is also not sufficiently called out in the subsequent section on climate services. (Patricia Jacobberger-Jellison, NASA)	Have looked at this issue for 2.3 and will continue to develop this theme
461	49980	2	15	26	15	26	It would be helpful to specify what the acronym IHDP stands for. (Katharine Mach, IPCC WGII TSU)	Text edited
462	52128	2	15	26	15	29	In providing a definition of "institutions" here, the chapter team could also consider cross-referencing the definition in the report glossary. (Katharine Mach, IPCC WGII TSU)	Will do next time
463	45709	2	15	36	15	36	As adaptation is generally a local issue - to be successful, adaptation plays across all scales and should involve institutions from national to local (Roger Street, UK Climate Impacts Programme)	Local to national level integration-addressed
464	42288	2	15	37	15	37	(Agarwal et al., 2008) analyzed? No subject (Luhui Yan, Tanzuji)	Noted
465	49027	2	15	40	0	0	The reference to Smit et al. Looks awkward, replace "(Smit et al., 2001)" with "(2001)" (Oyvind Christophersen, Climate and Pollution Agency)	Noted
466	38204	2	15	40	15	42	This sentence says that countries with strong institutions are generally assumed ot have greater capacity but this sounds circular in that a definition of a strong institution would be one that has great capacity. (Janet Swim, The Pennsylvania State Universi)	Agreed
467	54170	2	15	40	15	44	The same examples are discussed in section 2.3.2.2, and should be coordinated. (Michael Mastrandrea, IPCC WGII TSU)	Addressed
468	48896	2	15	41	0	0	strong institutions' - suggest that a co-requisite is coherent inter-institutional planning and action, which also pertains to governance (2.2.2.2) and cross cutting issues (2.3.1.3) (Leon Soste, Department of Primary Industries, Victoria, Australia)	Coherent institutional planning and action-Addressed
469	52462	2	15	43	0	0	Paragraph Comment: The seminal papers on adaptive management are missing. The NRC is an excellent citation. It's unclear where Table 2.2 fits into this section; it seems to be a nice illustration of the text without appropriate reference/discussion in the text. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Noted
470	47928	2	15	44	0	0	While the distinction between developed/developing countries is important, It is also important to highlight that even within countries (developing/developed) there is an uneven distribution of institution that can appropriately respond to climate challenges (ie. within marginalized regions or indigenous territories). For instance see Kronik and Verner (2010)'s publication Indigenous Peoples and Climate Change in Latin America and the Carribbean: "..lack of an institutional framework in Latin American countries to facilitate a dialogue between indigenous peoples and public authorities...prevents the effective participation of indigenous peoples in climate change adaptation initiatives. [Thus] public adaptation programs do not adequately consider the specific climate concerns of indigenous peoples" (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies)	Intra-country uneven distribution of institutions. Dialogue with the indigenous people especially in Latin America-addressed
471	36937	2	15	51	15	54	This argumentation is based on a static approach. Climate changes also naturally, adaptation in agricultral practices have and will take place constantly. There is no guarantee that the same crops (grapes) can be planted in the same place "forever". Consequently there are no other options that adaptation. The introduction of new/modified grapes will lead to different but not necessarily lower qualities. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
472	46687	2	15	51	16	2	Beside the cyclone examples from Bangladesh the experiences of Cyclone Katerina and cyclone Nargis in Myanmar can also be sited here which has demonstrated institutional shortcomings vis-à-vis decision making problems. (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	Text removed
473	43882	2	16	0	0	0	Section 2.2.2.2.: What about cross-scale effects and issues that require collaboration across departments and jurisdictional boundaries? (Russell Wise, CSIRO)	Mentioned but not in detail
474	40718	2	16	4	0	27	These paragraphs seem out of place in the chapter. (Karen Hardee, Futures Group)	Text removed
475	48057	2	16	4	16	15	It would be good to cover the UNFCCC Nairobi Workplan and the National Adaptation Plans of Action (NAPAs) (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Done
476	52968	2	16	4	16	15	This seems inappropriate in an IPCC report, where readers could be expected to know most of this. It also is unclear how this fits into the section and chapter. (Kristie L. Ebi, IPCC WGII TSU)	Text removed
477	36938	2	16	7	16	54	More emphasis should be given here to the fact that tourist regions may and shall adapt. Tourism patterns have changed over the last century and will continue to do so. Also very hot places in this world have sees a booms in tourism, downturns are mainly affected by politicial circumstances (e.g. Egypt). The Alpine region might shift its focus from skiing to hinking, etc. If well thought through, such adaptations do not necessarily cause too high economic losses. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
478	48058	2	16	14	16	15	Is this relevant for this chapter? (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Text removed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
479	39144	2	16	17	16	18	From my direct observation of and research into the behaviour of the development industry and associated aid agencies and creditors, the impression I have is that sustainable agriculture and sustainable ways of life in general are still being systemtically undermined in socalled underdeveloped countries, for example in East Timor. (Thomas Reuter, University of Melbourne)	Need the climate change context and text has been tightened
480	54171	2	16	17	16	27	Please ensure that this discussion reflects the range of perspectives in the literature. (Michael Mastrandrea, IPCC WGII TSU)	Text removed
481	41310	2	16	21	16	21	"Climate change has become assistance" - what do you mean?? (Gisela Böhm, University of Bergen)	Text removed
482	48059	2	16	21	16	27	See OECD Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation at http://www.oecd.org/dac/environmentanddevelopment/oecdpolicyguidanceonintegratingclimatechangeadaptationintodevelopmentco-operation.htm (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Section has been severely trimmed, meaning that such discussion has no current placeholder
483	43129	2	16	30	0	0	Section 2.2.2.2 needs a clearer definition of governance. The definition needs to be consistent with that used in other chapters (e.g. in section 8.4 and section 19.7.5). The statement, "government is still the major actor in the lives of public especially in the developing countries," is difficult to defend; and as a blanket statement it probably is not true. (Adrian HAYES, Australian National University)	Text edited
484	52754	2	16	32	17	14	This is currently a weak section, considerably shorter than other sections (e.g. the one on pyschology), the ultimate point of which needs to be clearer. I rather disagree with the opening sentence. Certainly in academia at least, governance is no longer viewed in this way. However, government is indeed still the major actor in many contexts. Other sources on the subject of climate change governance could be consulted/ referenced, e.g. Ostrom E. Polycentric systems for coping with collective action and global environmental change. Global Environmental Change 2010, 20: 550–557. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Yes, section has been even more truncated but Ostrom is relevant. Will investigate further in next draft (subject to review comments also)
485	48060	2	16	37	16	38	Please clarify this sentence about complimentarity (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Text cut significantly
486	54172	2	16	37	16	38	This statement requires clarification, as mitigation and adaptation can be complementary in some ways. (Michael Mastrandrea, IPCC WGII TSU)	Not here, relevant to section 2.4.1
487	41153	2	16	37	16	40	Section 2.2.2.2 Pg. 16 line 37-40 - This insinuates that mitigation and adaptation are mutually exclusive and you can't have one that complements the other. If this was the intent I do not agree, and it is not consistent with what has been written in other chapters (Ch 14, section 14.2.2 pg 8). Consider re-phrasing. (Susan Evans, WWF-Canada)	Text removed
488	52755	2	16	38	0	38	The apparent suggestion that mitigation cannot be complimentary with adaptation contradicts what has been said in section 1.2.5. This reinforces the need to make a better job of introducing the links in Ch 1. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Text removed
489	41311	2	16	38	16	38	"complimentary" - what do you mean?? (Gisela Böhm, University of Bergen)	Text removed
490	42289	2	16	38	16	38	(IPCC, 2007b) stressed? No subject (Luhui Yan, Tanzuji)	Text removed
491	45710	2	16	38	16	38	...one cannot be complimentary to the other.' Suggest that this is not necessarily always the case (Roger Street, UK Climate Impacts Programme)	Text removed
492	54173	2	16	38	16	41	In the context of the glossary definitions for this report, it seems that "risk" is meant rather than "societal vulnerability" here. (Michael Mastrandrea, IPCC WGII TSU)	Text edited and phrasing removed
493	49981	2	16	39	16	39	Instead of "societal vulnerability," as the author team more nearly mean risk? (Katharine Mach, IPCC WGII TSU)	Text edited and phrasing removed
494	45711	2	16	40	16	41	...needs knowledge of anticipated regional and local impacts and vulnerabilities assocated with projected climate change and... (Roger Street, UK Climate Impacts Programme)	Text edited
495	43880	2	16	40	16	41	Poorly worded sentence. It is unclear what this means? (Russell Wise, CSIRO)	Text edited
496	43881	2	16	43	16	43	Surely 'local' dimensions should be included too?! (Russell Wise, CSIRO)	We have not included that here, but that point is covered elsewhere
497	52969	2	16	43	16	54	It is unclear how this is relevant to the section. (Kristie L. Ebi, IPCC WGII TSU)	Text removed
498	47735	2	16	43	17	10	I would recommend agains including a paragraph like this here that attempts to describe future impacts of climate change. Such a list can never be complete given the breadth of such potential impacts (which are really discussed elsewhere in the WGII report); thus, it seems as if a few select impacts were included here. Moreover, this paragraph doesn't seem to add much to the discusion in this section. (Eric Toman, The Ohio State University)	Text removed
499	48495	2	16	44	16	44	Inequity does not need to be in quotation marks. (Dominic Roser, University of Zurich, University of Graz)	Text removed
500	53864	2	16	45	16	45	Principal should be principle (Stephan Lewandowsky, University of Western Australia)	Text removed
501	40884	2	16	48	16	53	This discussion of precaution fails to differentiate between the precautionary principle and precautionary approach, which remains an important distinction and may be an indicator of some of the changes in action and committment towards climate change since 2007. These are not interchangeable terms. Numerous interprestations have hampered application of precaution in application and implementation, resultiingin uneven relevance and application (Hovi, J., D. Sprinz, F. Detlef and A. Underdal. 2009. "Implementing Long-Term Climate Policy: Time Inconsistency, Domestic Politics, International Anarchy". Global Environmental Politics, 9(3):20-39.) Environmental scientists prefer the use of the precautionary principle, (which asks how much harm is acceptable rather than how much harm can be avoided), is preferred by environmental scientists whenever possible (Lubchenco J. 1998. "Entering the Century of the Environment: A New Social Contract for Science." Science 279:491-497; Lubchenco, J., S. Palumbi, S. Gaines and S. Andelman. 2003. Plugging a Hole in the Ocean: The Emerging Science of marine Reserves. Ecological Applications 13(1) S3-S7.) (Lynn Wilson, SeaTrust Institute)	Text removed, but will flag this point for discussion on risk in government draft

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
502	47734	2	16	49	16	49	Avoid use of subjective terms such as "the most importat new principle of international environmental policy." This statement is untestable. (Eric Toman, The Ohio State University)	Text removed
503	49982	2	16	49	16	49	It would be helpful to clarify "was emerging" further--when, where, in what context? (Katharine Mach, IPCC WGII TSU)	Text removed
504	48061	2	16	53	16	53	See UK OSI Foresight report on Migration at http://www.bis.gov.uk/assets/foresight/docs/migration/11-1116-migration-and-global-environmental-change.pdf (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Mentioned in text and will flag this point for discussion on risk in government draft
505	49983	2	16	53	17	6	The author team could consider linking these statements to examples and findings from other chapters in the report. (Katharine Mach, IPCC WGII TSU)	Need to do more work on this
506	48496	2	16	54	17	10	It might be helpful if among the various examples mentioned in these lines the core distributional issue (i.e.: impacts disproportionally affect poor regions) would come out more clearly. (Dominic Roser, University of Zurich, University of Graz)	Not sure we can do so here - a job for other chapters that we could reflect in the final draft
507	48732	2	17	0	0	0	Section 2.2.2.3, Evaluation and Reflexiveness: this section seems fairly weak, focusing on complexity and vagueness rather than including some of the excellent work done on this issue in the adaptive management field. At a minimum the authors could distinguish between the task of evaluation or monitoring relative to clearly stated, measurable objectives vs. monitoring and evaluation relative to more general goals, which does indeed get difficult (if you haven't laid out explicit targets, it's hard to know if you've met them). (Jennifer Hoffman, EcoAdapt)	Yes, agreed. This section is now part of 2.2.1.3, where we have gone partway to addressing this point. It is revisited in Section 2.3
508	54174	2	17	1	17	1	Changes by what mechanism? Due to sea level rise? (Michael Mastrandrea, IPCC WGII TSU)	Presume changes in sea ice but not spelt out.
509	54175	2	17	1	17	3	Is there literature available on examples of this already occurring in the Arctic? (Michael Mastrandrea, IPCC WGII TSU)	Chapter 6 cited
510	52970	2	17	1	17	10	How is this relevant to decision implementation? (Kristie L. Ebi, IPCC WGII TSU)	Legal concerns are cited, but this section remains weak
511	49985	2	17	7	17	25	Across these paragraphs, it would be preferable to highlight examples from other countries as well. (Katharine Mach, IPCC WGII TSU)	This section requires further development in the next draft
512	49984	2	17	12	17	14	As this paragraph is further developed, the author team should provide citations in support of statements made. (Katharine Mach, IPCC WGII TSU)	This section requires further development in the next draft
513	43883	2	17	12	17	14	It will be beneficial for the reader to be referred to relevant chapters that address these issues. (Russell Wise, CSIRO)	This section requires further development in the next draft
514	54176	2	17	12	17	14	Please develop this paragraph further. (Michael Mastrandrea, IPCC WGII TSU)	This section requires further development in the next draft
515	48062	2	17	12	17	14	This paragraph needs expansion - there are books and practical examples on insurance and legal issues (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	This section requires further development in the next draft
516	47736	2	17	12	17	14	While true, this paragraph is really too vague to be useful. (Eric Toman, The Ohio State University)	This section requires further development in the next draft
517	40885	2	17	14	0	0	(Add more on insurance to lead into later sections. Suggest:) Appropriately addressing climate change goes beyond the historical approaches to disasters resulting from weather events (Adger, et. al, 2007. Assessment of adaptation practices, options, constraints and capacity. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds. Cambridge University Press, Cambridge, UK, 717-743; Repetto, R., 2008: The climate crisis and the adaptation myth. Working paper No. 13, Yale School of Forestry and 54 Environmental Studies, New Haven, USA..) As disaster risk reduction and climate change adaptation are increasingly understood to be closely connected, risk transfer through new financial mechanisms, particularly in developing countries, is being highlighted in the literature and by practitioners as a strategy for resilience and adaptation in conjunction with other strategies such as early warning systems, data surveillance, governance and legislation, education, training and awareness (Wilson, L. and B. Burns. (forthcoming) 2013. Insuring and Reinsuring Against Disaster: An Approach to Funding the Goals of Resilience and Recovery. Contribution to the ISDR Global Assessment Report on Disaster Risk Reduction 2013.) (Lynn Wilson, SeaTrust Institute)	Consideration of insurance has been removed from the chapter
518	41154	2	17	19	0	0	Section 2.2.2.3 Pg 17 line 19 – find this section confusing and Figure 2-3 does not seem to represent what is written in the text. Clarity is needed. (Susan Evans, WWF-Canada)	This section is now part of 2.2.1.3, where we have addressed this point. Figure removed.
519	40719	2	17	19	0	21	This is a good point and should be brought up earlier in the chapter. (Karen Hardee, Futures Group)	This point needs to be added to the uncertainty section
520	47929	2	17	19	17	21	Perhaps rephrase to "however, SOME climate change impacts will be outside the reange of historical experience requiring extensive further adaptation" to better reflect the literature that states that many societities (indigenous, local, traditional) will continue to successfully adapt to the unforseen impacts of climate change. See for instance Nakashima, D et al. (2012) "Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation" Paris, UNESCO and Darwin, UNU, 120 pp (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies)	Text removed
521	54177	2	17	23	17	25	The sixth pillar seems to be missing or not stated clearly. (Michael Mastrandrea, IPCC WGII TSU)	Text corrected
522	43884	2	17	26	17	29	What about interventions that change institutions? How are these monitored and measured? What criteria are appropriate? This aspect of adaptation has been under represented in this Chapter. (Russell Wise, CSIRO)	Yes, but relevant to 2.2.2
523	45712	2	17	29	17	29	...turning to maladaptation.' Not convinced that using 'maladaptation' in this way is helpful / informative (Roger Street, UK Climate Impacts Programme)	Reworded
524	52756	2	17	29	17	29	Readers could usefully be directed to a definition of maladaptation somewhere in the document. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	In the glossary.
525	45713	2	17	31	17	31	Monitoring, measuring and evaluating adaptation policies, programs...' (Roger Street, UK Climate Impacts Programme)	Reworded
526	48063	2	17	31	17	31	See also UKCIP AdaptME at http://www.ukcip.org.uk/adaptme-toolkit/ (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Noted - need to look at this later

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
527	46688	2	17	31	17	41	Beside the 'adaptation baselines' the emerging term "adaptation targetting" can also be elaborated in this section. Adaptation tragets allow to monitor the developments and advancements of adaptation activities from the adaptation baseline. (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	Not sure we need that here - the whole notion of outcomes is dealt with in Section 2.3
528	45715	2	17	31	17	41	Suggest looking at the UKCIP AdaptME resource (see www.ukcip.org.uk) in the context of monitoring and evaluation. (Roger Street, UK Climate Impacts Programme)	Noted - need to look at this later
529	52757	2	17	31	18	9	On monitoring and evaluation, see also: Haris E. Sanahuja (2011). Tracking Progress for Effective Action A Framework for Monitoring and Evaluating Adaptation to Climate Change. Global Environment Facility. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Noted - need to look at this later
530	45714	2	17	33	17	34	Using the term 'project' in this manner could be misinformative as adaptation should not be seen as a project. Also need to consider and provide some evidence of what is teh nature of a base line in the context of adaptive management (is today tomorrow's baseline) (Roger Street, UK Climate Impacts Programme)	Reworded
531	40886	2	17	43	0	0	Before the example starting on Ln 43, lead in to this sectionwith a disucssion of indicators for measuring adaptive capacity, especially social resilience at local or community levels. See Gooch, M. et al. 2012. "Community-Derived Indicator Domains for Social Resilience to Water Quality Decline in a Great Barrier Reef Catchment, Australia" in Society and Natural Resources, 25:421-439 for a discussion of indicator frameworks, social resilience and adaptive capacity. (Lynn Wilson, SeaTrust Institute)	Text removed and example withdrawn
532	52463	2	17	43	0	0	Paragraph Comment: The figure doesn't seem to match the text. Perhaps additional information is needed in the caption to better make the connection for those that are unfamiliar with the paper. (Melissa A. Kenney, Johns Hopkins University / National Oceanic and Atmospheric Administration)	Figure removed
533	54178	2	17	51	17	53	The distinction being made here between initiatives and processes is not clear, as well as the usage of sensitivity and vulnerability. (Michael Mastrandrea, IPCC WGII TSU)	Text removed
534	38205	2	18	0	0	0	I appreciate the recognition that values are more broadly defined than they had been but it is not clear what the definition of values is in this document. It appears that the authors mostly consider valuing relatively tangable things (e.g., places, humans) rather than psychological constructs. The review does mention freedom and, in the next section mentions biospheric, social-altriustic, and ego-centric values (It might be worth noting that Schultz describes these as environmental concerns and not values), But the discusion seems incomplete and the additional considerations seem to be add ons or a lack of agreement about what values are. A more complete discussion would, for instance, refer to Schwartz's research on individual values and cultural values. connecting what the authors already note about freedom and Schultz's work on individual values would recognize a larger structure for values (Bilsky, W., Janik, M., & Schwartz, S. H. (2011). The structural organization of human values—evidence from three rounds of the european social survey (ESS). Journal of Cross-Cultural Psychology, 42(5), 759-776. doi:10.1177/0022022110362757. Noting that cultural values are related to be distinct from individual values would help make connections to the levels of analyses that the authors discuss at the beginning and note in figure 1; Schwartz, S. H. (1999). A theory of cultural values and some implications for work. Applied Psychology: An International Review, 48(1), 23-47. doi:10.1111/j.1464-0597.1999.tb00047.x (Janet Swim, The Pennsylvania State Universi)	Text substantially revised along these lines and thanks for the references
535	43885	2	18	0	0	0	It is important here to emphasise the difference between decision makers and policy makers. This is important because most of the progress we make in adaptation will come about from proactive, prompt and effective public policy decision making that provides the incentives and institutional arrangements that influence and drive behaviour and support 'appropriate' private decision making. (Russell Wise, CSIRO)	This is a good point, but not for here.
536	54688	2	18	1	18	2	This diagram can be useful, however, the author team may wish to build from this figure that is relevant for a specific context and connect it with the discussion in chapter. Moreover, it will be useful if the revised diagram is discussed in detail. (Monalisa Chatterjee, IPCC WGII TSU)	Figure removed
537	47914	2	18	12	0	0	Section 2.2.3 doesn't talk about power, political economy, and other socioeconomic issues that may improve or constrain people's ability to "make decisions" and may lead to differential outcomes from those decisions. Also, the section is an extremely individualized description of how people make decisions. Even the section on Cultural Determinants treats them as outward factors which affect an individual's decisions rather than considering, for instance, collective decision-making. (Jenny Frankel-Reed, USAID)	Text has been significantly revised
538	42768	2	18	12	18	14	The discussion of insurance here is extremely thin, and I am hoping this is just a placeholder. Chapters 16 and 17 contain useful information on insurance and adaptation. (Sean Hecht, UCLA)	Insurance is no longer in the chapter (we can reconsider), but it rather belongs in sections on managing risk and risk spreading and tolerance.
539	36939	2	18	15	18	17	Please add a sentence to this introductory paragraph that it is necessary and possible for the agricultural sector to adapt. Several excelent examples can be found already today. This is certainly stated below on page 19, but it might well be mentioned already in the beginning, as well as in the summary at the beginning of chapter 1 (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
540	48897	2	18	18	0	0	2.2.3.1 - may wish to consider the interplay b/w values & aspirations (p3, line 23) throughout this section (Leon Soste, Department of Primary Industries, Victoria, Australia)	This has been expanded mainly via goals
541	54689	2	18	18	0	0	Section 2.2.3.1 - The author team may consider adding an example from a prominent sociological system as well. (Monalisa Chatterjee, IPCC WGII TSU)	Cases mentioned only very briefly. Will check other chapters

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
542	41312	2	18	20	0	0	Section 2.2.3. It is not correct that there is little research on the role of values in shaping adaptive decision. For example, a whole research field in the decision making literature deals with the question of how people make decisions in moral dilemma situations. Iliev et al (2009) discuss moral values in decision making. One aspect that is studied is the relation between moral values and instrumental trade-offs. The issue of incommensurable values is discussed under the terms 'protected values' or 'sacred values'. A summary of this research, as it is related to environmental decisions, is given by Böhm and Tanner (2012). Another broad field of study is the relationship of value orientations to environmental decisions. Two such classifications are particularly prevalent. One is the distinction between prosocial, individualistic, and competitive orientation and their influence on social dilemma decisions (see van Lange's research, e.g., van Vugt et al., 1996). The other is the value classification proposed by Schwartz (e.g., 2004). It has been adapted to environmental decisions by Steg and colleagues. Summaries of the research on value orientations and environmental behavior can be found in Soyez et al. (2009) and de Groot and Thøgersen (2012), on norms and environmental behavior in Keizer and Schultz (2012) Judith de Groot & John Thøgersen. (2012). Values and environmental behaviour. In L. Steg, A. E. van den Berg, & J. I. M. de Groot (Eds.), Environmental psychology: An introduction. New York: Wiley-Blackwell. Iliev, R., Sachdeva, S., Bartels, D., Joseph, C., Suzuki, S., Medin, D. (2009). Attending to Moral Values. In B. H. Ross (Series Ed.) & D. M. Bartels, C. W. Bauman, L. J. Skitka, & D. L. Medin (Eds.), Psychology of Learning and Motivation, Vol. 50: Moral Judgment and Decision Making. San Diego, CA: Academic Press. Kees Keizer & Wesley Schultz. (2012). Norms and environmental behaviour. L. Steg, A. E. van den Berg, & J. I. M. de Groot (Eds.), Environmental psychology: An introduction. New York: Wiley-Blackwell. Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of human values? Journal of Social Issues, 50, 19-45, doi:10.1111/j.1540-4560.1994.tb01196.x. Katja Soyez, Stefan Hoffmann, Stefan Wünschmann, and Katja Gelbrich (2009). Proenvironmental Value Orientation Across Cultures: Development of a German and Russian Scale, Social Psychology 2009; Vol. 40(4):222–233. DOI 10.1027/1864-9335.40.4.222 Van Vugt, M., Van Lange, P. A. M., & Meertens, R. M. (1996). Commuting by car or public transportation? A social dilemma analysis of travel mode judgements. European Journal of Social Psychology, 26, 373-395, doi:10.1002/(SICI)1099-0992(199605)26:3<373::AID-EJSP760>3.0.CO;2-1. (Gisela Böhm, University of Bergen)	Thanks for the references. This section has been substantially rewritten and research deficits placed in better context
543	47737	2	18	20	18	24	This section is much needed. I recommend using some standard works in social psychology to define values (e.g., the work of Milton Rokeach, Shalom H. Schwart, and Ajzen and Fishbein among others). (Eric Toman, The Ohio State University)	We could draw further from this work
544	41876	2	18	20	18	37	As a tool to evaluate the different type of the values, the role of the Life Cycle Assessment should be considered (e.g. ISO 14040). (Hiroaki Kondo, National Institute of Advanced Industrial Science and Technology (AIST))	Not here, but elsewhere perhaps
545	48497	2	18	20	18	37	It would seem appropriate that in a section on values the literature written by those people who actually work normatively on values in climate change would be examined or at the very least mentioned (for a selection see, for example, the 2010-volume entitled "Climate Ethics: Essential Readings" (New York: Oxford University Press) co-edited by Stephen Gardiner, Simon Caney, Dale Jamieson and Henry Shue). In environmental ethics more broadly, there is an even much larger literature that examines issues that are mentioned in this section in depth. (Dominic Roser, University of Zurich, University of Graz)	Added in the ethics section (2.2.3.4)
546	48733	2	18	23	0	0	Authors have argued for a broader conceptualization of values for some time in a variety of contexts. It would be good to place the discussion of how to incorporate values into climate change adaptation in the larger context of similar discussions in areas not explicitly linked to climate change. In other words, it would be good to acknowledge that we don't need to reinvent the wheel here, or at least not the whole thing. (Jennifer Hoffman, EcoAdapt)	We have developed this theme partially but can do more
547	48498	2	18	27	18	28	These two lines list a number of values that one might consider besides economic values. I find these examples important but would also like to stress that there are other central concerns that get lost when one expresses everything in economic terms: basic rights, freedoms, distributive justice, etc. (Dominic Roser, University of Zurich, University of Graz)	Added in the ethics section (2.2.3.4)
548	45716	2	18	32	18	40	Also suggest that there is also possibly those that consider human stewardship as a framing - right to use / exploit the environment and resources of the earth as humans are stewards. (Roger Street, UK Climate Impacts Programme)	Raised in Section 2.4.2
549	48898	2	18	33	18	35	it has further been suggested that people's value orientations determine ..' - suggest that the different ways that people view CC also stems from both a plurality of legitimate perspectives of CC overall (funtowitz & ravetz, 1994, Futures, 26,6, 568-582) and interpretational plurality in relation to the meaning of the effects of CC (van Asselt above) (Leon Soste, Department of Primary Industries, Victoria, Australia)	True, also raised by Hulme and others - revisit in next draft
550	35508	2	18	36	18	37	This statement downplays the increasing amount of literature in the social sciences touching on climate change. For example, in an early study, Wilet Kempton et al. (1995) examined U.S. environmental values by conducting semi-structured interviews with 43 informants as well as a survey of 42 respondents. They investigated their informant's perceptions of three major environmental changes, namely ozone depletion, species extinction, and global warming. (Hans Baer, University of Melbourne)	See below
551	47738	2	18	36	18	39	These statements are mostly accurate (e.g., there is limited work directly assessing values regarding adaptation to climate change) but there is substantial work assessing values, beliefs, attitudes, and norms towards environmental issues that can inform this discussion (there are numerous potential authors, but see work of Jerry Vaske, Michael Manfredo, Riley Dunlap, Thomas Dietz, among others). (Eric Toman, The Ohio State University)	Expanded section has picked up some of this work

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
552	47930	2	18	39	0	0	See similar examples in Australia like Altman, J.C and K. Jordan "Impact of Climate Change on Indigenous Australians: Submission to the Garnaut Climate Change Review" CAEPR Tropical Issue No. 3/2008 and Green, D et al (2009) Disproportionate burdens: the multidimensional impacts of climate change on the health of Indigenous Australians in The Medical Journal of Australia 190 (1): 4-5. - specifically reference to "for many indigenous peoples, a connection with country is a determinant of health. If the 'country' becomes 'sick" through environmental degradation, climate impacts or inability of the traditional owners to fulfil cultural obligations through ongoing managemnet, the people of that land will feel this 'sickness' themselves (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies)	Great point - not in - will address in next draft
553	41313	2	18	39	18	53	No other study has been discussed in such detail - why this one of all possible studies; what is so special about it? This selection seems somewhat odd. How representative of the research is this study? It does not seem to deal with decision making specifically. There must be other ample evidence of situations where something that people value is affected by climate change impacts (e.g., in tourism or agriculture). (Gisela Böhm, University of Bergen)	Example removed
554	48899	2	18	40	18	53	sense of place' - may wish to strengthen importance of sense of place to other groups in the discussion examples - eg primary producers have often farmed in the same place for multiple generations, grown up, borne children, battled fires, helped at school etc - all of which builds strong psychological links to place Rogan et al (2005), J of Envl Psych, 25, 147-158. (Leon Soste, Department of Primary Industries, Victoria, Australia)	see reponse to comment 552
555	54180	2	18	53	18	53	Argued by whom? In the literature? Or is this a finding? Please clarify. (Michael Mastrandrea, IPCC WGII TSU)	Yes (not italicized in draft - need to fix)
556	53865	2	18	53	18	53	The psychological literature on the mental-health impacts of climate change is relevant here and might be worth pointing to. (Stephan Lewandowsky, University of Western Australia)	Expand in next draft - not this section though
557	52971	2	19	1	19	3	This key finding should be in the Executive Summary. (Kristie L. Ebi, IPCC WGII TSU)	Develop in next draft
558	49986	2	19	4	19	4	"moderate confidence" -- As calibrated uncertainty language per the guidance for authors, this phrase should be italicized. Additionally, presumably the author team means "medium" here instead of "moderate" to be consistent with the uncertainties guidance? (Katharine Mach, IPCC WGII TSU)	Needs correction in submitted draft
559	42473	2	19	9	14	19	I don't agree with this statement 'Decision-making in climate change problems is not really rational and can negatively affect environmental behaviour'. Further investigation and solid reasoning would be required to justify this statement. (Shahbaz Mushtaq, University of Southern Queensland)	Wording could be improved but the point is widely backed by the literature
560	47739	2	19	9	19	10	Need citations here. (Eric Toman, The Ohio State University)	Still to be added
561	47471	2	19	11	19	11	Contradicting results' - be more explicit here what is meant: also in a rational social planner situation, the advent of new information can lead to an increase of uncertainty - due to outliers. (Hermann Held, University of Hamburg)	Good point - can be developed here or in uncertainty section
562	54181	2	19	11	19	13	It would be useful to clarify a bit further how environmental behavior can be negatively affected in this context. (Michael Mastrandrea, IPCC WGII TSU)	Still to be done
563	47740	2	19	11	19	13	Need to clarify the statement that "Decision-making in climate change problems is not really rational..." as the same could be said for decision-making in most contexts. What do you mean by this statement? Does the decision process used vary depending on who the decision-maker is (e.g., lay public vs. experts)? (Eric Toman, The Ohio State University)	Phrasing needs to be improved
564	41317	2	19	16	0	0	An important reference for cultural determinants of decision making is Medin's work, for example: Atran, S. & Medin, D.L. (2008). The Native Mind and the Cultural Construction of Nature. Boston, MA.: MIT Press. Sachdeva, S., Singh, P. and Medin, D. (2011). Culture and the quest for universal principles in moral reasoning. International Journal of Psychology, 46: 3, 161 — 176. (Gisela Böhm, University of Bergen)	taken in consideration
565	41316	2	19	16	0	0	Section 2.2.3.2. Cultural psychology is a relatively small subfield of psychology. That psychology is listed in the heading of this section, and only here, is a misrepresentation of the discipline. Psychology is relevant to many other sections (most notably to the entire section 2.2.3, but to others as well). But since no other scientific discipline is mentioned in the headings, I wonder why it is listed at all. (Gisela Böhm, University of Bergen)	not taken into consideration, conceptual problems
566	41315	2	19	16	0	0	Section 2.2.3.2. The classification of biospheric, altruistic and egoistic value orientations is one of values; it would fit better in Section 2.2.3.1 than under cultural determinants. (Gisela Böhm, University of Bergen)	taken into consideration
567	47741	2	19	16	19	30	Consider whether the discussion of the Schultz work should come in the previous section where "values" are introduced and first defined. (Eric Toman, The Ohio State University)	taken into consideration
568	41314	2	19	23	19	30	Wesley Schultz's work is with no doubt very important in this context, but again it seems odd that of all his work this article is selected to be described in detail; what is the criterion? It is also not particularly recent. Would it not be better to rely on meta analyses and review papers to identify general patterns which are then fleshed out with examples? (Gisela Böhm, University of Bergen)	may be the literature is not recent but for a new chapter it is important, it is the basic reference
569	52972	2	19	29	19	30	An example would be helpful. (Kristie L. Ebi, IPCC WGII TSU)	Text removed
570	47176	2	19	32	19	40	This paragraph offers a reductionist and, if not erroneous, at least totally misleading analysis of human-nature relationships, over-simplified as two presumably opposing 'models': the spiritual and the ecological. Given that anthropology is evoked in the previous paragraph (line 16), a more subtle analysis of the diversity of human-environment relations is called for. Philippe Descola, for example, proposes four ontologies in his book "Beyond Nature and Culture": animism, totemism, analogism and naturalism, of which the latter englobes contemporary western scientific thought. If the analysis, based on Ignataw, is supposed to only make reference to developments within contemporary Western (perhaps largely American) society, then this should be made explicit. Descola, Phlippe. 2005. Par-delà nature et culture (Beyond Nature and Culture). Paris: Gallimard. (Douglas Nakashima, UNESCO)	taken into consideration, we do not have enough space to explane the complexe theorie of Descola

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
571	42916	2	19	32	19	40	This section on environment and cultural values in the decision-making process could do with expansion beyond the one model you have presented - see my comments and the cross link with chapter 4 page 56 line 11 onwards and discussion and references on environmental ethics contained in Albrecht, G.A., Brooke, C., Bennett, D.H., and Garnett, S.T. (in press) The ethics of assisted colonization in the age of anthropogenic climate change, J Agric Environ Ethics. (Cassandra Brooke, WWF-International)	included in the part of ethic
572	53866	2	19	42	19	50	The section on cultural cognition must refer to the work by Dan Kahan, who is the world's leading expert on this issue with respect to climate change. (e.g., Kahan, D. M. Fixing the communications failure Nature, 2010, 463, 296-297).20 (Stephan Lewandowsky, University of Western Australia)	not pertinent
573	47743	2	19	44	20	6	The text here first introduces the distinction between holisitic and analytical thinking but then focuses on collectivist and individualist societies (without really describing what those are). It then seems to jump back and forth between these concepts as if they were interchangeable. (Eric Toman, The Ohio State University)	not pertinent
574	47742	2	19	48	19	48	Consider use of term "dialectical." This sentence is unlikely to be clear to most readers. (Eric Toman, The Ohio State University)	not pertinent
575	54182	2	19	51	19	53	Please clarify what is meant by benchmarks in this context. (Michael Mastrandrea, IPCC WGII TSU)	Language issue (shared benchmarks or common reference - needs to be fixed)
576	47177	2	20	8	20	12	Recent reviews of the scientific literature on the relevance of local, traditional or indigenous knowledge for CCIAV include: Roncoli, C., Crane, T. and Orlove, B. 2009. Fielding climate change in cultural anthropology. In: S.A. Crate and M. Nuttall (eds.) Anthropology Climate Change From Encounters to Actions. Left Coast Press, pp. 87–115 [citing 192 sources]; Crate, S.A. 2011. Climate and culture: anthropology in the era of contemporary climate change. Annual Review of Anthropology, 40, 175–94 [citing 136 sources]; Nakashima, D.J., Galloway McLean, K., Thulstrup, H.D., Ramos Castillo, A. and Rubis, J.T. 2012. Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. Paris, UNESCO, and Darwin, UNU, 120 pp. [citing 305 sources]. (Douglas Nakashima, UNESCO)	taken in consideration
577	47931	2	20	10	0	0	Perhaps also include: Nakashima, D et al. (2012) "Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation" Paris, UNESCO and Darwin, UNU, 120 pp and see Galloway-McLean (2010) Advanced Guard for further examples (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies)	taken in consideration
578	49441	2	20	15	0	0	What are the differences of using the concept of 'risk' as noun (at-risk) or as verb (to-risk) in terms of CCIAV (section 2.2.3.3) (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Have added climate related references re risk amplification etc
579	46689	2	20	19	20	22	The experiencial or experiences driven meanings and languages should also be incorporated in the decision making processes (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	Added material on narratives
580	53867	2	20	24	20	37	No discussion of language in the IPCC report can be complete without citing the work of Budescu; e.g., Budescu, D. V.; Por, H.-H. & Broomell, S. B. Effective communication of uncertainty in the IPCC reports Climatic Change, 2011 (Stephan Lewandowsky, University of Western Australia)	Done. Excellent ref - thanks
581	47472	2	20	47	20	53	Isn't 'good decision' characterized by a convergence of descriptive and normative along time? People learn about what is normatively possible, and the decision-frameworks should be adjusted to people's preferences whenever self-consistently possible. (Hermann Held, University of Hamburg)	Text removed - this is better in another section (2.3.7), good point though
582	39493	2	21	1	21	6	Some of this paragraph would actually be very useful earlier in the chapter, setting out the reasons for the various risk discussions that precede this section. (Sarah Cornell, Stockholm Resilience Centre)	Para moved
583	36940	2	21	16	21	16	Intensification of agriculture does not necessarily imply a negative impacts on water quality. Therefore the term "expected" could be exchanged with "possible but avoidable". (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
584	36941	2	21	20	21	20	Please exchange the term "deteriorating" with "changing". (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
585	41318	2	21	46	21	46	Jones (2011) is missing in reference list. (Gisela Böhm, University of Bergen)	Added
586	36943	2	21	48	21	48	Here it might be considered to check and add: Holsten, A.; Vetter, V.; Vohland, K.; Krysanova, V. (2009): Impact of climate change on soil moisture dynamics in Brandenburg with a focus on nature conservation areas. Ecological Modelling, 220/17, 2076-2087 (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
587	54183	2	21	48	21	49	Addressed by whom? Researchers, or decision-makers? Please specify, and ensure that the framing does not imply policy prescription. (Michael Mastrandrea, IPCC WGII TSU)	Sentence removed
588	54184	2	21	49	21	51	What benefit would this expansion provide? This needs to be spelled out more clearly. (Michael Mastrandrea, IPCC WGII TSU)	taken into consideration
589	49987	2	22	1	0	0	Section 2.2.3.4. The author team should provide citations for statements made in this section. (Katharine Mach, IPCC WGII TSU)	taken into consideration

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
590	49552	2	22	1	22	14	The analysis of ethical and moral issues in section 2.2.3.4 is extremely cursory, particularly when compared with the extensive discussion in WGIII, Ch 3. The distinction drawn between moral and ethical aspects is unclear and not supported by the literature. It would be preferable, as per WGIII, Ch 3 to frame the discussion primarily in terms of ethical issues. The analysis of responsibility in WGIII, Ch 3 also suggests that it is not necessarily the case that ethical analysis of adaptation requires a 'whole of climate' approach. A focus on rights rather than liability in adaptation is supported by Harris and Symons (2010). 'Justice in adaptation to climate change', but there is by no means consensus on this in the literature on climate ethics. For other views see Vanderheiden (2011). 'Globalizing responsibility for climate change', and Grasso (2010), 'Justice in funding adaptation to climate change'. The earlier work of Adger et al on fairness in adaptation (2006) also remains pertinent. Although some of these issues could be addressed through cross-referencing to WGIII, Ch 3, other aspects specific to adaptation should be addressed. Note for example the literature on the ethical differences betwen adaptation and mitigation (eg Jagers and Duus-Otterstrom 2008). Some of the discussion of ethical aspects of adaptation in WGII, Ch 16.7 could be brought into this more general section. Finally, some of the discussion on values elsewhere in WG II, ch 2 could be linked to the discussion of morals and ethics. After all, as WG III, Ch 3 notes, values (along with justice) are an important dimension of ethical decision-making. Similarly, some psychological aspects discussed in chapter 2 (Eg re egoism / altruism) also reflect underlying ethical viewpoints. (Jonathan Pickering, Australian National University)	taken into consideration
591	48499	2	22	3	22	5	I have read many papers in the area of climate ethics and have never come across this distinction. Many people use morality and ethics interchangeably. Of those who do not use it interchangeably, some use morality to refer to the values and principles themselves and ethics to refer to the theorizing about these values and principles. (Dominic Roser, University of Zurich, University of Graz)	taken into consideration
592	45717	2	22	3	22	5	moral concerns may also include those associated with vulnerabiity of people and places as a result of adaptation actions by others and related to justice issues (Roger Street, UK Climate Impacts Programme)	taken into consideration
593	41319	2	22	4	22	5	I do not undertand this statement - human agency and the ascription of responsibility are central components of moral judgments, how can moral concerns be indepedent of agency? (Gisela Böhm, University of Bergen)	taken into consideration
594	48500	2	22	7	22	10	I wasn't able to clearly understand the message of this paragraph. In general, I find this section to be extremely important (though I think it could be merged with a much expanded section 2.2.1.5). (Dominic Roser, University of Zurich, University of Graz)	taken into consideration
595	48064	2	22	7	22	10	This could be expanded e.g. to cover issues regarding who pays for adaptation (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Section much expanded on this point
596	49553	2	22	10	0	0	Moral responsibility of specific agents for adaptation to climate change may be discussed even the absence of blame (see Pickering and Barry, forthcoming [Critical Review of International Social and Political Philosophy]. 'On the concept of climate debt', and Vanderheiden 2008, Atmospheric Justice.). Moral responsibility and blame are not equivalent. (Jonathan Pickering, Australian National University)	That's what this sentence says, but section is expanded
597	36942	2	22	15	22	48	It might be considered to also check and quote: Klaus M., Holsten A., Hostert P., Kropp J.P. (2011): An integrated methodology to assess windthrow impacts on forest stands under climate change. Forest Ecology and Management, 261/11, 1799-1810 and Rybski D., Holsten A., Kropp J.P. (2011): Towards an unified characterization of phenological phases: fluctuations and correlations with temperature, Physica A, 390(4), 680-688 (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
598	49433	2	22	17	0	0	Expand the criteria used to assess 'good decisions' (e.g., include the concepts of efficiency and equity) (section 2.3) (Fabiola S. Sosa-Rodriguez, University of Waterloo)	Needs to be wrapped in Section 2.3 a little better
599	39494	2	22	17	0	0	Some of this section feels repetitive of earlier text on 'good decision-making' - some restructuring or cross-ref flagging would be good. (Sarah Cornell, Stockholm Resilience Centre)	See previous point
600	48734	2	22	21	0	0	Again, I would argue that a good decision does not always produce the intended outcome, even if it gives you the best chance of the intended outcome. (Jennifer Hoffman, EcoAdapt)	Good has been redefined to better to allow for relative change rather than absolute outcomes
601	52758	2	22	21	22	21	From what literature are the 3 characteristics drawn? (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Literature expanded
602	45718	2	22	21	22	21	I note that there are other characteristics of good decisions (more than actionable, effective and producing the intended outcomes) (Roger Street, UK Climate Impacts Programme)	Text changed considerably
603	47744	2	22	21	22	28	Fairly simplistic description and needs citations. (Eric Toman, The Ohio State University)	Text changed but still needs more citations
604	49988	2	22	33	0	0	Section 2.3.1.1. The author team should provide additional citations supporting statements made in this section. (Katharine Mach, IPCC WGII TSU)	Citations have been added (but could do with more)
605	41320	2	22	35	0	0	Section 2.3.1.1. I find this section unclear - what are the problem attributes of climate change? They are not named clearly. (Gisela Böhm, University of Bergen)	taken into consideration
606	47745	2	22	35	22	41	Again, this needs citations. In addition, I suggest including example of increasing sophistication in how climate change is framed. (Eric Toman, The Ohio State University)	Citations added - at the moment increasing sophistication is implict but is certainly mentioned in section 2.1
607	54185	2	22	39	22	41	This example seems to be an example of solutions tailored to fit the available information. Is this the example meant to be given? It may be useful to provide a contrasting example of the preferred alternative--climate information being tailored for solutions. (Michael Mastrandrea, IPCC WGII TSU)	Text condensed - example removed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
608	53868	2	22	39	22	41	This is unclear: Does this mean that planning takes into account extreme events? Or is it based on gradual mean changes? The work by Hunter might be helpful in this context because it derives mathematical constraints on the effects of extreme values: Hunter, J. A simple technique for estimating an allowance for uncertain sea-level rise Climatic Change, 2011 (Stephan Lewandowsky, University of Western Australia)	Example removed, but this comment proves the point.
609	49989	2	22	45	22	45	"likely" -- The author team should avoid casual usage of this reserved likelihood term. (Katharine Mach, IPCC WGII TSU)	Disagree. But text removed anyway.
610	49990	2	22	47	22	47	The phrasing of this sentence would benefit from clarification. (Katharine Mach, IPCC WGII TSU)	This line is a space between paras
611	47746	2	22	53	23	5	A transition is needed before this discussion of attribution. (Eric Toman, The Ohio State University)	Text on attribution removed
612	49991	2	22	54	22	54	The phrasing on this line ("whole of climate response") would benefit from clarification. (Katharine Mach, IPCC WGII TSU)	Text removed
613	48735	2	23	8	23	49	This all seems a bit theoretical and not very meaty. It would be nice to have more discussion of what's actually been observed or tested, of how we know these four attributes link to success, and why these four are the most important attributes. (Jennifer Hoffman, EcoAdapt)	Have taken a step back from these
614	52973	2	23	23	23	36	What do these lists of attributes/approaches mean and how can they be used? (Kristie L. Ebi, IPCC WGII TSU)	See above
615	45719	2	23	31	23	31	Leadership also needs to be looked at in the context of the broader community (place and sector). I would also note that leadership is also particularly important in the context of dealing with conflicts and identifying synergies (as well as tradeoffs) (Roger Street, UK Climate Impacts Programme)	Yes, but have not expanded para
616	41321	2	23	34	23	36	Sentence unclear; what are the three leadership styles and what are the characteristics of each of them? (Gisela Böhm, University of Bergen)	Can clarify in next version
617	47747	2	23	38	23	43	I don't quite follow how the capitals as "resources for decision-making" comprise a solution attribute. Suggest increasing clarity of text here. (Eric Toman, The Ohio State University)	Text removed
618	43800	2	23	38	23	43	Recent analyses of typical patterns of vulnerability attempt to respond to the need of rationally allocating the limited resources available to developing solutions (Jäger et al. 2007, Kok et al. 2010, Sietz et al. 2011 a and b). The analyses of vulnerability patterns categorise the multiple dimensions of vulnerability for example in global drylands and in smallholder systems in the Peruvian Altiplano (Sietz et al. 2011a and b). Dealing with the complex vulnerability-creating mechanisms, the proposed cluster approach is useful to understand functional similarities and differences from a broader perspective and can be applied to any socio-ecological system at any spatial scale. The perspective on a generalised or intermediate functional level enables the setting of priorities for vulnerability reduction and supports related monitoring efforts based on the manageable number of key indicators. REFERENCES: Jäger, J., Kok, M., Mohamed-Katerere, JC., Karlsson, SI., Lüdeke, MKB., Dabelko, GD.,Thomalla, F., de Soysa, I., Chenje, M., Filcak, R., Koshy, L., Long Martello, M.,Mathur, V., Moreno, AR., Narain, V. and Sietz, D. (2007) Vulnerability of peopleand the environment: Challenges and opportunities. In: Global EnvironmentOutlook: Environment for development (GEO-4). UNEP, Progress Press, Valletta,Malta, pp. 301-360. ------ Kok, M., Lüdeke, MKB., Sterzel, T., Lucas, PL., Walther, C., Janssen, P., de Soysa, I., Tekelenburg, T., Sietz, D. and Brighenti, J. (2010) Quantitative analysis of patterns of vulnerability to global environmental change. Netherlands Environmental Assessment Agency, Potsdam Institute for Climate Impact Research, Norwegian University of Science and Technology. ------ Sietz, D., Lüdeke, MKB. and Walther, C. (2011a) Categorisation of typical vulnerability patterns in global drylands. Glob. Environ. Chang. 21: 431-440. ----- Sietz, D., Mamani Choque, SE. and Lüdeke, MKB. (2011b) Typical patterns of smallholder vulnerability to weather extremes with regard to food security in the Peruvian Altiplano. Reg. Environ. Chang., Published online: 15 November 2011, DOI: 10.1007/s10113-011-0246-5. (diana sietz, Wageningen University)	These references are useful, but this text has been removed. May be useful for 2.3.2
619	45720	2	23	38	23	43	Resources are also required for monitoring and evaluation (i.e to support the learning) (Roger Street, UK Climate Impacts Programme)	Text better integrated
620	49992	2	23	38	23	49	It would be preferable to provide citations in support of statements in these paragraphs. (Katharine Mach, IPCC WGII TSU)	Text removed
621	54186	2	23	42	23	43	One could argue that new processes can be more efficient by avoiding barriers found in existing processes (e.g., bureaucracy, entrenched special interests, etc.). Please ensure that this discussion reflects all perspectives in the literature, and adds citation support that is currently lacking. (Michael Mastrandrea, IPCC WGII TSU)	Text removed
622	52759	2	23	47	23	48	In what sense is this a 'hierarchy' of agents? If it is, why are individuals at the top? (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	Text removed
623	43886	2	24	0	0	0	Section 2.3.1.3. There are times earlier in this chapter where it will be informative and useful to refer the reader to this section. Or at least to mention in earlier sections that these cross-scale issues are recognised and dealt with at a later stage, because as one is reading the earlier sections one keeps wondering why these aren't being acknowledged and addressed. (Russell Wise, CSIRO)	Chapter has been crafted into more of a narrative to help this but further imporvements can be made
624	49993	2	24	6	24	26	The author team might consider providing more background citations for further information regarding these points. (Katharine Mach, IPCC WGII TSU)	Citations have been added (but could do with more)
625	43887	2	24	8	24	10	This sentence doesn't read well. (Russell Wise, CSIRO)	Text removed
626	43888	2	24	12	24	21	This paragraph is confusing. An institution cannot be an actor?! There seems to be confusion here between organisations and institutions. This language needs to be tightened up because it is very confusing and makes little sense. (Russell Wise, CSIRO)	This has not been addressed and needs to be (especially clarifying between institutions as setting rules and organisations that behave as actors)
627	52974	2	24	12	24	26	It is unclear how this is relevant to the section. (Kristie L. Ebi, IPCC WGII TSU)	Better integrated into text
628	36926	2	24	22	11	24	There is no indication that climate change would increase the frequency of storms. This argument contradicts SREX as well as earlier statements in this report. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
629	47178	2	24	28	24	36	As already raised earlier in this chapter (p. 20, lines 6 to 12), forms of knowledge other than scientific knowledge, such as local and indigenous knowledge, are also a key resource for appropriate decision-making. SUGGEST ADDING THE FOLLOWING SENTENCES TO LINE 35: Local or indigenous knowledge is another form of specialised knowledge that may be particularly appropriate for effective decision-making, as it may contribute locally-relevant observations, priorities and values (Nakashima et al. 2012). Here again, knowledge transfer from local knowledge holders to decision-makers may present a number of challenges. Nakashima, D.J., Galloway McLean, K., Thulstrup, H.D., Ramos Castillo, A. and Rubis, J.T. 2012. Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. Paris, UNESCO, and Darwin, UNU, 120 pp. (Douglas Nakashima, UNESCO)	am planning to add Nakashima reference to response to comment 753, in 2.3.6 discussion on local knowledge systems
630	52975	2	24	28	24	36	This could be tied with the discussion about learning. (Kristie L. Ebi, IPCC WGII TSU)	Discussion on learning truncated
631	36944	2	24	35	24	43	In the Baltic Sea research warmer summers (and warmer waters) have led to an increase of pike perches, see Zeynep Pekcan-Hekim, Lauri Urho, Heikki Auvinen, Outi Heikinheimo, Jyrki Lappalainen, Jari Raitaniemi, Pirkko Söderkultalahti. 2010. Climate Warming and Pikeperch Year-Class Catches in the Baltic Sea. AMBIO (2011) 40:447–456 DOI 10.1007/s13280-011-0143-7 (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
632	54696	2	24	38	24	44	Figure 2.4 has a lot of information and the author team may consider adding more discussion explaining different aspects of the figure. (Monalisa Chatterjee, IPCC WGII TSU)	Done
633	54697	2	24	50	25	10	Figure 2.5 needs more explanation, the author team could use an hypothetical example to explain the different aspects of this figure. Perhaps the team could add sections (a,b,c) to the figure and go over each of those components. (Monalisa Chatterjee, IPCC WGII TSU)	More explanation provided
634	43889	2	25	0	0	0	Section 2.3.2.1. Why no mention of baselines? Surely a baseline is essential for assessing impacts? And this baseline cannot be an assumption of the status quo continuing! A huge problem with doing economic assessments of impacts for the distant future is that these assessments are based on totally unrealistic and improbable assumptions about preferences being consistent over time, relative prices being meaningful, partial equilibrium assumptions and marginality continuing to be valid, etc. This is not even mentioned here? Many questions and doubts are raised in the readers mind when the authors of this Chapter promote economic studies based on highly questionable approaches and assumptions. (Russell Wise, CSIRO)	baselines are discussed in 2.2.2.3; also mentioned in 2.3.2.1 on page 26, line 17; could add to statement on page 26 about difference from assumed economic and technological baseline
635	49994	2	25	12	25	12	It would be helpful to provide more specific indication of what is meant by "the cases that follow" perhaps with a reference to section 2.3.2 (if this is what is meant). (Katharine Mach, IPCC WGII TSU)	2.3.2 does not review examples of decisions, as literature has not been identified; 2.3.4, 2.3.5 and 2.3.6 does include text on some cases where possible options were assessed, and in some cases, decisions made, but it is not clear if there are cases in which adaptation decisions have been evaluated after implementation; it would take a period of many years after implementation before an action could be properly assessed
636	44168	2	25	17	0	0	Section 2.3.2: Many advances have been made in the operationaization of climate change impacts or vulnerability assessments (given the definitions of these terms according o the AR4). The chapter sould elaborate to some extend on these advances also from the methodological side. These are based on various methods, such as indocator-based approaches or modeling approaches. 1. Indicator based approaches: for a multi-sectoral example see Holsten et al. 2012 (based on natural as well as socioeconomic sectors and the consideration of different climate models), for sectoral examples see Gardali et al. 2012 (species) or Perch-Nielsen et al. 2009 (tourism) 2. Modeling approaches: e.g Schröter et al. 2005, Ciscar et al. References: Metzger, M. and D. Schröter 2006. Towards a spatially explicit and quantitative vulnerability assessment of environmental change in Europe. Regional Environmental Change 6, 201-216. Holsten A., & Kropp J.P.: An integrated and transferable climate change vulnerability assessment for regional application, Natural Hazards,DOI 10.1007/s11069-012-0147-z Perch-Nielsen, S.L. (2009), "The vulnerability of beach tourism to climate change – an index approach", Climatic Change: Volume 100, Numbers 3-4 / June 2010, Pages 579-606;Received: 12 December 2007; Accepted: 28 July 2009; Published Online: 24 September 2009, under DOI: 10.1007/s10584-009-9692-1. Gardali T, Seavy NE, DiGaudio RT, Comrack LA (2012) A Climate Change Vulnerability Assessment of California's At-Risk Birds. PLoS ONE 7(3): e29507. doi:10.1371/journal.pone.0029507 Ciscar, J.C., A. Iglesias, L. Feyen, L. Szabó, D. Van Regemorter, B. Amelung, R. Nicholls, P. Watkiss, O.B. Christensen, R. Dankers, L. Garrote, C.M. Goodess, A. Hunt, A. Moreno, J. Richards, and A. Soria, 2011: Physical and economic consequences of climate change in europe. Proceedings of the National Academy of Sciences of the United States of America, 108(7), 2678-2683. (Anne Holsten, Potsdam Institute for Climate Impact Research)	already cited Ciscar et al (2011) on page 26, line 31; will review Metzger and Schroter (2006), Holsten et al (2012)
637	44166	2	25	19	25	20	How can beneficial aspects of cliate change be assessed in the given concept? (Anne Holsten, Potsdam Institute for Climate Impact Research)	will include language on assessing potential benefits, linking to page 26, lines 27-37, which will be expanded as per response to comment 654 {SJC]
638	48900	2	25	21	0	0	as the scientific u/standing of CC improves' - may wish to include something which deals with u/standing of decision making processes (Leon Soste, Department of Primary Industries, Victoria, Australia)	link back to 2.2.1?
639	45721	2	25	23	25	24	Not sure 'ensuring is the appropriate wording. It would be useful to elaborate or at least point to this initiatives (through their respectiuve websites). (Roger Street, UK Climate Impacts Programme)	will consider alternative wording, and add more detail on initiatives
640	44167	2	25	23	25	24	What is the relevance of the stated initiatives? Please proide some information and literature sources if they are relevant. (Anne Holsten, Potsdam Institute for Climate Impact Research)	see response to comment 639

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
641	40887	2	25	25	0	0	Add short section on the work by boundary organizations to assess impacts, vulnerabilities and risks such as aUniversity of Michigan initiative: the Great Lakes Integrated Sciences and Assessments Center (GLISA) 2012 which awarded 2 to 4 one-year grants of up to $50,000 each to organizations that will work with GLISA to address the risks of climate change and variability in the Great Lakes basin http://glisa.umich.edu/research/2012grants.php. Background and context for boundary organizations that straddle the divide of environmental science and policy is found at: Guston, David H., William Clark, Terry Keating, David Cash, Susanne Moser, Clark Miller, and Charles Powers. 2000. "Report of the Workshop on Boundary Organizations in Environmental Policy and Science." 9-10 December 1999, Bloustein School of Planning and Public Policy, Rutgers University, New Brunswick, NJ. Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2000-32. Piscataway, NJ: Environmental and Occupational Health Sciences Institute at Rutgers University and UMDNJ-RWJMS; Cambridge, MA: Global Environmental Assessment Project, Environment and Natural Resources Program, Kennedy School of Government, Harvard University. Available at http://environment.harvard.edu/gea. (Lynn Wilson, SeaTrust Institute)	will add text on identifying boundary organizations as important contributors to these assessments; Guston (2001) paper on boundary organizations already cited in 2.3.1.3, page 24, line 19, so will link back to this section; will also review Varady et al (2011) and Kirchoff et al (2012) examples on water management
642	45722	2	25	27	28	9	Not clear what as written these sections are achieving or whether they are delivering what is stated in the introduction of 2.3.2 . I was expecting advances since the AR4, identification of [evolving] challenges and gaps. I am not convinced that his has been achieved. (Roger Street, UK Climate Impacts Programme)	2.3.2 was written to both provide context on the evolution of scenario-based assessment, differing from post-event assessments, and to identify challenges/gaps; gaps include relationship between adaptive capacity and vulnerability, various layers of the 'adaptation deficit', and projected damage scenarios and the role of discount rates; some examples of post-AR4 literature are included (e.g. page 26 line 31-37), but given space limitations, the regional chapters, as well as 16, 18 and 19 are cited; what else should be added?
643	40695	2	25	29	26	52	The concept of adaptation scenarios has been explored by Vidal et al. (2012) for assessing the impact on spatio-temporal drought characteristics at the scale of France. They introduced the notion of perceived drought characteristics, as conditionned not only on the climate projections but also on the selected adaptation scenario. Vidal, J.-P., Martin, E., Kitova, N., Najac, J. & Soubeyroux, J.-M. (2012) Evolution of spatio-temporal drought characteristics: validation, projections and effect of adaptation scenarios. Hydrology and Earth System Sciences, accepted. (Jean-Philippe Vidal, Irstea)	this could help address comment 642; how can I obtain this reference?
644	41322	2	25	31	25	31	Kates et al. (1985) is missing in reference list. (Gisela Böhm, University of Bergen)	will add citation
645	48901	2	25	46	25	47	series of translations' - see earlier comment re: translators needing to be involved in the assessment / decisional process because this changes their perception / understanding of the nature / dimensions of the problem and enhances their ability to effectively translate information to the required format (Leon Soste, Department of Primary Industries, Victoria, Australia)	can link to discussion on climate serevices, page 29, line 45 to page 30, line 11
646	45723	2	25	46	25	48	how does this first sentence relate to subsection 2.3.2.2? It seems to be indicating why impact studies are conducted - need for some discussion on their use for making the case for mitigation targets, as well as informing vulnerability, risk and adaptation assessments (Roger Street, UK Climate Impacts Programme)	could add language on how different emission scenarios lead to different impact scenarios (high emissions - high impacts; low emissions - low impacts)
647	54698	2	26	5	26	10	The chapter team may wish to coordinate with other chapters to determine how this process of translation has happened in each case and add a broad overview section for the report here. (Monalisa Chatterjee, IPCC WGII TSU)	good idea, and also addresses comment 642; maybe create a table; need to find diverse examples of cases (different regions)
648	36945	2	26	5	26	10	The current sea wall protection system in the Netherlands is so good that such an assumption is highly speculative. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	do not understand this comment
649	54188	2	26	5	26	10	This introduction of Figure 2-6 should explain the combination of top-down and bottom-up that appears in the figure. A potential example appears in lines 18 through 25, but it is not currently linked to the figure explicitly. (Michael Mastrandrea, IPCC WGII TSU)	will revise text; would also like to include challenge of adding future dimension to 'bottom-up' assessment, linking to new RCP process; see response to comments 836-837, 840-842 (collaborate with SD?)
650	52760	2	26	5	26	25	Figure 2-6 could be better explained and linked to the text. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	see response to 649
651	36946	2	26	12	26	28	It might well be presumed that the current health systems in Europe will stay as good as they are and are likely to improve. Hygene and health systems are the best way to deal with diseases. It should be noted here that Malaria was an abundant disease in western Europe, an still is in parts of Eastern Europe. Some latest Malaria evidences from as north as Finland stem from the 1950's after which the disease was halted via improving hygene and health systems. Therefore it is questionable that future scenarios as described here are likely. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	similar response as to comment 648
652	48902	2	26	19	26	25	biophysical futures are superimposed on socio-economic futures' (lines 24/25). This is really quite a challenging area which may require further discussion - there are profound questions embedded in the nature of socio-economic futures and how we represent them. Ciscar's work assumes a static (no adaptation) context and attempts to shed light on the impacts of CC in the 2080's if it were to occur now. This approach (which is used fairly commonly) involves major assumptions which need to be clearly articulated and critically considered before we accept the conclusions. It may be useful to acknowledge that evaluation of systemic socio-economic impacts likely to be produced by biophysical model outputs is a complex area (eg Ch 16, p3, lines 32/33 - 'uncertainty regarding future..socio economic trajectories.. is a significant challenge') and identify it as an area requiring considerable attention (Leon Soste, Department of Primary Industries, Victoria, Australia)	agree; will coordinate with Chapter 16

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
653	46007	2	26	23	26	25	For example in the Indus basin in Pakistan Yu et al., (2012) used an integrated systems framework analysis to estimate the hydrologic and crop impacts of climate change risks, the macro-economic and the household-level response as an effective method for assessing a variety of adaptation investments and policies. Among its findings were that future climate risks were to impact the macro-economy and households. Given the orographic complexity of the Upper Indus Basin (a largely snow-melt dominated basin), the uncertainties of future climate impact are high and GCMs are unlikely to have much value for forecasting purposes. However, institutional instruments (possible flexible policy adjustments and mechanisms within the wider framework of the present inter-provincial Water Allocation Accord) were found to have a critical hydrologic impact on the system. (Luis E. Garcia, World Bank)	would like to obtain Yu et al (2012) reference
654	48255	2	26	36	26	37	"A similar study was conducted in the UK" What are the details of the study? (Malini Nair, Indian Institute of Science)	will provide additional discussion on the study by Hunt (2008)
655	45724	2	26	36	26	37	Results of the similar study? (Roger Street, UK Climate Impacts Programme)	similar response as to comment 654
656	37658	2	26	38	0	0	I think this is an example where U.S. work broadens the discussion, rather than dominates it -- given that the only other example is European work. Add(?): Sandia National Laboratories, considered the impact of climate change in the absence of mitigation and adaptation policy for each of the interconnected U.S. states, across 70 industries, through the year 2050 (Backus et al., 2012). The non-discounted cost was over 1 trillion U.S dollars with employment losses at nearly 7 million person-years. [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)	will review this reference by Backus et al
657	45725	2	26	39	26	49	Appears to be identifying a use of impact assessments (Roger Street, UK Climate Impacts Programme)	agreed
658	46006	2	26	43	26	45	The use of the WEAP model is reported here. This model is also mentioned in Chapter 15, page 26, lines 28 to 33. Nothing wrong with that but this is the only model mentioned and there are many other models being used for similar purposes (as reported for example, by Rodriguez-Iturbe and Valdes, 2011). Maybe a clarification about that would be useful here. (Luis E. Garcia, World Bank)	would like to obtain Rodriguez-Iturbe and Valdes (2011) reference
659	43130	2	27	1	0	0	Section 2.3.2.2 raises the issue of the relationship between vulnerability and adaptive capacity again. (See my comment on chapter 1, page 11, line 1 above.) Here the AR4 definition of adaptive capacity is cited (in the first paragraph); and it is further noted "the relationship between adaptive capacity and vulnerability is not clear." It is also not clear to the reader why s/he should accept the premise of the last sentence, namely that we should accept that the USA is a country with "high adaptive capacity." Clearly the experience with Hurricane Katrina suggests otherwise. A crucial reference here is William R Freudenburg, Robert Gramling, Shirley Laska, and Kai Erikson, 'Catastrophe in the Making: The Engineering of Katrina and the Disasters of Tomorrow'. Washington DC: Island Press/Shearwater Books, 2009. The study shows how in this instance government actions (and those of some other stakeholders) made New Orleans maladaptive (i.e. less adaptive) to predictable environmental change. (Adrian HAYES, Australian National University)	would like to obtain Freudenburg et al reference; will also coordinate with Chapter 26 (North America); also see comment 662
660	54190	2	27	3	27	8	It would be useful to link this discussion with the discussion later in the section about AR5 Chapter 19's approach to key vulnerabilities. (Michael Mastrandrea, IPCC WGII TSU)	agreed; will coordinate with Chapter 19
661	52129	2	27	4	27	4	In providing a definition of "vulnerability" here, the chapter team could also consider cross-referencing the definition in the report glossary. (Katharine Mach, IPCC WGII TSU)	agreed
662	52130	2	27	10	27	11	In providing a definition of "adaptive capacity" here, the chapter team could also consider cross-referencing the definition in the report glossary. (Katharine Mach, IPCC WGII TSU)	agreed
663	54191	2	27	12	27	16	The same examples are discussed in section 2.3.2.2, and should be coordinated. (Michael Mastrandrea, IPCC WGII TSU)	from comment 467
664	48065	2	27	18	27	18	Adaptation deficit is commonly used to describe the lack of adaptation to present climate variability (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	see comment 665
665	52131	2	27	18	27	19	In introducing the concept of "adaptation deficit," the chapter team could consider providing cross-reference to the report glossary, which contains the term. (Katharine Mach, IPCC WGII TSU)	agreed
666	54690	2	27	18	27	26	The concept of 'adaptation deficit' has also been used by chapters 14, 16, the author team is encouraged to coordinate with these chapters and the glossary for consistent interpretation of the concept. (Monalisa Chatterjee, IPCC WGII TSU)	agreed; will coordinate with chapters 14 and 16
667	52976	2	27	28	27	29	This has not been discussed previously. Perhaps the issue of attribution could be raised earlier in the chapter. (Kristie L. Ebi, IPCC WGII TSU)	this is an important point; 2.3.1.1 discusses attribution of climate change itself to anthropogenic or natural causes, but there is no earlier discussion on attribution of climate-related damage to anthropogenic climate change, and/or natural climate variability, and/or more people in harm's way, and/or planning/management decisions that exacerbated climate-related vulnerability; perhaps there is a place for some introductory text on attribution of climate-related damage in 2.2.1
668	54192	2	27	29	27	36	Please coordinate this discussion with the other chapters in AR5 assessing this topic. Those include chapters 10 and 18. (Michael Mastrandrea, IPCC WGII TSU)	agreed; also see comment 667

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
669	52977	2	27	32	27	34	This is not what the SREX concluded. Please correct. (Kristie L. Ebi, IPCC WGII TSU)	SREX concluded the following: "Increasing exposure of people and economic assets has been the major cause of long-term increases in economic losses from weather- and climate-related disasters...but a role for climate change has not been excluded" (SREX, page 9); the current language in lines 31-34 is not inconsistent with SREX conclusions, and is drawing on other sources, but agree to add quote from SREX page 9
670	52978	2	27	34	27	39	What do discount rates have to do with attribution? (Kristie L. Ebi, IPCC WGII TSU)	choice of discount rates influences calculations of future costs of climate change impacts, and projected future effectiveness of implemented adaptation measures; will clarify this; also connected with comments 656 and 667
671	43890	2	27	41	27	43	Great stuff! And this applies to the previous section on impact assessments too! In fact the whole of this sub-section is dealt with very well. (Russell Wise, CSIRO)	thanks
672	40888	2	27	43	0	0	[Add] A cross-cutting view can be taken through examining the effects of climate change on human health. Relevant at all scales, across national and ecosystem boundaries, using health to guide research-to-decision-making pathways (NIEH/NIH: 2010. A Human Health Perspective On Climate ChangeA Report Outlining the Research Needs on the Human Health Effects of Climate ChangeThe Interagency Working Group on Climate Change and Health1 APRIL 2010: Environmental Health Perspectives and the National Institute of Environmental Health Sciences available at http://www.niehs.nih.gov/health/assets/docs_a_e/climatereport2010.pdf), surveillance indicators for practitioners and policy makers that include climate-sensitive health outcomes and environmental and vulnerability indicators, as well as mitigation, adaptation, and policy indicators of climate change (English PB, Sinclair AH, Ross Z, Anderson H, Boothe V, Davis C, et al. 2009. Environmental Health Indicators of Climate Change for the United States: Findings from the State Environmental Health Indicator Collaborative. Environ Health Perspect 117:1673-1681.). (Lynn Wilson, SeaTrust Institute)	will review references by NIEH/NIH and English et al
673	52979	2	27	49	27	50	This is mostly discussed earlier. (Kristie L. Ebi, IPCC WGII TSU)	see comment 674
674	52980	2	27	52	27	54	Please cite the relevant sections of chapter 19. (Kristie L. Ebi, IPCC WGII TSU)	19.2.2 and 19.2.3; will indicate this in revision
675	47916	2	28	0	0	0	Another kind of 'emergent risk' might be ecosystem state shifts based on thresholds and tipping points, which can have cascading impacts on resource availability, land use, other drivers of change, etc. This could also be referenced in 2.3.4 (Natural Resource Mgmt.). (Jenny Frankel-Reed, USAID)	will consider adding this in page 28, lines 4-9, and 2.3.4; will cite 19.2 discussion on emergent risks
676	37661	2	28	2	0	0	The direct impact in one industry, such as chemicals, can have spillover impacts in other industries, such as construction, textiles, and agriculture. These impacts can be multiples of the direct impacts. Industries like construction and transportation potentially benefit from climate change because of adaptation investments, and the migration of population and businesses (Backus et al., 2012). [Vugrin E.D., D.E. Warren, and M.A. Ehlen, 2011: A resilience assessment framework for infrastructure and economic systems: Quantitative and qualitative resilience analysis of petrochemical supply chains to a hurricane. Process Safety Progress, 30(3), 280–290 DOI: 10.1002/prs.10437] [Vugrin, E. and M.A. Turnquist, 2012: Design for Resilience in Infrastructure Distribution Networks. Sandia National Laboratories. Report SAND2012-6050 Albuquerque, NM. Available at: http://www.sandia.gov/CasosEngineering/docs/Vugrin_resilient_design_2012_6050.pdf] [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)	will review reference by Vugrin
677	37659	2	28	2	0	0	This section does little to frame the economic risk that can drive the mitigation and adaptation decisions among the industrial and industrializing nations. Add(?): Industry within the industrialized and industrializing nations will directly and indirectly contribute a major proportion of adaptation and mitigation investments. The cost and need to create resilience, in addition to the cost of inaction, depend on the uncertainty of climatic conditions and the economic consequence of those conditions. Uncertainty and consequence combine together to define the risk. Industry needs quantification of the costs and risks it may face from inaction, as well the cost it can avoid through adaptation investments and practices that lead to resilience to climate change. Vugrin (Vugrin et al, 2011) has developed methods to determine the cost and benefit of various levels of resilience, including calculations that incorporate uncertainty (Vugrin and Turnquist, 2012). Analyses can determine what aspect of uncertainty most contributes to risk. Such knowledge can then guide research either to reduce the uncertainty or to create processes to limit the consequences. (George Backus, Sandia National Laboratories)	see comment 676
678	37660	2	28	2	0	0	To estimate the impact of climate change, it is not necessarily required that the baseline be a valid projection of the future conditions. Referent projections agreeable to policy makers, allows analyses that determine the differential impact of climate change relative to the referent. Because future climate condition 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. Interactions among the industrial sectors and delays in recognizing the full impact of climate change can lead to costs that are significantly different from those associated with the immediate and direct impact of, for example, extreme events. Using the above concepts, Sandia National Laboratories demonstrated the use of risk assessment methods to quantify the impacts from the uncertainty in climate change-induced variability in water supply on 70 interacting industries within the interconnected U.S. states through 2050. (George Backus, Sandia National Laboratories)	see comment 656

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
679	52981	2	28	4	28	9	Please cite the relevant sections of chapter 19. (Kristie L. Ebi, IPCC WGII TSU)	see comment 675
680	49995	2	28	4	28	9	This discussion of the emergent risks should be further coordinated with Chapter 19, as for example the definition implied on lines 6-7 may be a bit different from the treatment in chapter 19. (Katharine Mach, IPCC WGII TSU)	agreed; will coordinate with chapter 19
681	36947	2	28	11	28	40	This assumption is possible but somehow speculative and a bit overrated. Impacts of slr and heat are possible but very difficult to estimate. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Nor for this chapter
682	52762	2	28	12	0	0	section 2.3.3. Surprising not to see reference to the EU's new 'Clearing House', or platform, launched earlier this year. See http://www.eea.europa.eu/themes/climate/european-climate-adaptation-platform-climate-adapt (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	included
683	45726	2	28	12	30	50	Would have thought that there would be some mention of the science need to support the development and delivery of climate services. This science (not climate science) is weak and at best fragmented. This appears to be more from a GFCS perspective rather than a broader climate information and knowledge to inform adaptaton decision making. Also note that climate services include more than just climate projections and scenarios (e.g., include observations from a variety of sources). For example, observations are particularly important for adaptation. (Roger Street, UK Climate Impacts Programme)	included
684	52761	2	28	16	28	16	The wrong section numbers are given. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	corrected
685	39495	2	28	20	0	0	the introduction section does not need a heading - especially since there's an intro paragraph before it anyway. (Sarah Cornell, Stockholm Resilience Centre)	corrected
686	49996	2	28	22	28	22	It would be helpful to indicate more specifically what is meant by "ever more relevant"--for example, as compared to what baseline, for what reasons, etc.? (Katharine Mach, IPCC WGII TSU)	see follow-up sentence, now linked with a
687	52982	2	28	22	28	27	This information is repeated. (Kristie L. Ebi, IPCC WGII TSU)	from 1st paragraph? Deleted in 1st para: "or between climate service and public demand..."
688	45727	2	28	29	28	45	May want to refer to the WMO Technical Note (Roger Street, UK Climate Impacts Programme)	included
689	49997	2	28	42	28	45	The author team may wish to evaluate its degree of certainty in this statement, assigning summary terms for evidence and agreement or a level of confidence. (Katharine Mach, IPCC WGII TSU)	the measure "degree of uncertainty" does not fit with this issue of RCS
690	45728	2	28	51	28	52	Climate Services as an expansion of the tasks provided by weather services and similar operational organisations - suggest that this may not be sufficient to deliver what is required. (Roger Street, UK Climate Impacts Programme)	added
691	36949	2	29	4	29	19	The terroir approach is static and does not even take natural climatic changes into account. This is mentioned in the paragraph but might thus be stressed even stronger. Adaptation (varying/modifying/changing) grapes is the only solution (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	included
692	49998	2	29	8	29	8	It would be helpful to indicate more specifically the timeframe intended for the increase in sophistication described on this line. (Katharine Mach, IPCC WGII TSU)	passage deleted
693	47748	2	29	8	29	9	This sentence seems to be missing something. In the current version I don't see the connection between the statement that services have become increasingly sophisticated and the 1978 U.S. National Climate Program Act (which is largely viewed as a failure in the U.S.). (Eric Toman, The Ohio State University)	passage deleted
694	45729	2	29	8	29	12	There should be recognition of the diverse sources of climate services (both private and public) and the nature of these services in terms of meeting the needs of the diverse user communities. (Roger Street, UK Climate Impacts Programme)	included
695	52983	2	29	11	29	12	How useful are these? (Kristie L. Ebi, IPCC WGII TSU)	added evaluation
696	36948	2	29	14	29	14	It is very likely that consumers change over the next decades. Therefore this static approach is not helpful here. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	included
697	45730	2	29	14	29	26	This appears to a predominately supply drive focus. Even with points within 4-6 this definition is still supply focused. Phrases such as 'to inform the climate forecast community of their information needs', and 'access to users' is too limited an articulation of what is needed. (Roger Street, UK Climate Impacts Programme)	included
698	45731	2	29	27	29	29	Not convinced that this is true of all providers of climate services. Note that for may providers, climate services are a line of business. (Roger Street, UK Climate Impacts Programme)	meaning of sentence changed accordingly
699	40720	2	29	32	0	0	Section 2.3.3.3. This section starts with a definition of decision support but does not tie back to section 2.2.1.1., on page 6, line 6, which is about decision support. Editing can remove the duplication. (Karen Hardee, Futures Group)	nachsehen
700	52984	2	29	34	29	34	Decision support is not just communication. (Kristie L. Ebi, IPCC WGII TSU)	communication deleted; is mentioned later on now
701	52985	2	29	34	29	43	This paragraph is hard to follow. If the point is that the model of scientists delivering data, information, and knowledge to users doesn't work, then it would be helpful to suggest an alternative. (Kristie L. Ebi, IPCC WGII TSU)	rephrased
702	47473	2	29	39	29	41	I am not sure whether this harsh formulation does H. and N. justice. Social planner models are not useless per se - otherwise we would not have a whole chapter (WGIII,6) devoted to them. Rather they must be embedded in an iterative procedure in which their assumptions must be contested. The social planner models are indispensible tools when we want to find out what would be economically possible in a world of max. cooperation. Also it is not clear whether authors who promote social planner models ever understood them in this linear sense as claimed. (Hermann Held, University of Hamburg)	included, rephrased

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
703	40889	2	29	45	30	15	How do we gauge demand in the absence of knowledge and awareness through capacity building (which is an agreed-upon need in most global areas)? This section would also benefit from framing a discussion about the highly variable abilities among stakeholders to use the various types of scientific knowledge due to, but not limited to this list: 1) educational levels 2)the geographic relevance and scale of information and 3) the societal relevance of the science as it is presented to them (Lynn Wilson, SeaTrust Institute)	included
704	43891	2	29	49	27	49	This distinguishes between "uncertainty and risk" in what would assume to be the Knightian senses of the words, which is inconsistent with the framing of risk and uncertainty up to this point. This needs to clarified and made consistent. (Russell Wise, CSIRO)	not necessary here in our opinion
705	43892	2	29	54	29	54	This suggests that one needs to begin with end users' needs, but it commonly the case that end users' are not aware of what they need. Therefore step 3 might be better integrated with step 1 or it should come before step 1, so that all relevant stakeholders are invovled upfront in identifying and determining user needs. (Russell Wise, CSIRO)	changed accordingly
706	43893	2	30	1	30	1	It is concerning here that we promote "institutional stability" when what we make actually need is to identify where institutions need to change and also to have institutions that are sufficiently flexible and/or robust to change in line with and in response to climate and ecosystem changes. (Russell Wise, CSIRO)	accepted; changed accordingly
707	38208	2	30	4	30	6	It would seem appropriate to mention formal informal science eductation when discussion dialogue between science and the public. Such as education in k-12 school systems, educational efforts on the web, education in zoos and aquariums, and other locations (see for instance, http://caise.insci.org/uploads/docs/Eval_Framework.pdf) (Janet Swim, The Pennsylvania State Universi)	added
708	54691	2	30	4	30	11	The author team may consider expanding with more discussions on different ways of translating from diverse types of evidence, and especially the strategies used by chapters in the report. (Monalisa Chatterjee, IPCC WGII TSU)	good idea, but not enough space left for this here
709	45732	2	30	9	30	11	Do stakeholder include both users and providers of climate services? I would suggest that it should and that in so doing the text needs to be broadened to address all of these stakeholders (including the wide diversity of providers and users). The communications should also include how climate services can be used, as well as limitations, etc. (Roger Street, UK Climate Impacts Programme)	included
710	49999	2	30	13	30	15	The author team may wish to use calibrated uncertainty language to characterize its degree of certainty in this statement. (Katharine Mach, IPCC WGII TSU)	this statement cannot be calibrated in this sense
711	48066	2	30	23	30	24	PRECIS was developed by the UK Met Office (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	included
712	52986	2	30	23	30	24	What is meant that PRECIS is an obligatory passage point? And what about other earth system models? (Kristie L. Ebi, IPCC WGII TSU)	changed
713	52987	2	30	26	30	28	That is certainly one view. The chapter is supposed to provide a range of views. (Kristie L. Ebi, IPCC WGII TSU)	added positive aspects
714	53869	2	30	27	30	27	What does "discursive hegemony of the IPCC and global governance mechanisms" actually mean? (Stephan Lewandowsky, University of Western Australia)	deleted: discursive hegemony
715	47932	2	30	32	0	0	Additional important lituerature on the issue include: Alexander, C., Bynum N., Johnson, E., King, U., Mustonen, T., Neofotis, P., Oettle, N., Rosenzweig, C., Sakakibara, C., Shadrin, V., Vicarelli, M., Waterhouse, J., and Weeks, B., (2011). Linking Indigenous and Scientific Knowledge of Climate Change. In Bioscience 61(6): 477-484. Ford, J.D., Pearce T., Gilligan, J., Smit, B., and Oakes, J., Climate Change and Hazards Associated with Ice Use in Northern Canada. Artcic, Antartic and Alpine Research 40(4), 647-659 (2008); Ulloa, A., (2011) Perspectivas Culturales del Clima. Universidad Nacional de Colombia, Instituto Latinoamericano para una sociedad y un derecho alternativo. (Ameyali Ramos Castillo, United Nations University - Institute of Advanced Studies)	okay
716	47179	2	30	32	30	34	A revealing case study from high Arctic Canada, demonstrates initial incommensurability of Inuit and scientific observations of changing weather patterns (Gearheard et al. 2010), followed by strong correlation when the appropriate phenomena for measurement and appropriate analyses are identified by meteorologists (Weatherheard, Gearheard and Barry 2010). Nakashima et al. (2012: 35-37) analyse how scientists tend to initially discount the indigenous observations, when in actual fact, shortcomings may derive from the practice of science. Gearheard, S., Pocernich, M., Stewart, R., Sanguya, J. and Huntington, H.P. 2010. Linking Inuit knowledge and meteorological station observations to understand changing wind patterns at Clyde River, Nunavut. Climatic Change, 100: 267–94; Nakashima, D.J., Galloway McLean, K., Thulstrup, H.D., Ramos Castillo, A. and Rubis, J.T. 2012. Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. Paris, UNESCO, and Darwin, UNU, 120 pp.; Weatherhead, E., Gearheard, S. and Barry, R.G. 2010. Changes in weather persistence: insight from Inuit knowledge. Global Environmental Change, 20: 523–28; (Douglas Nakashima, UNESCO)	okay
717	52988	2	30	32	30	36	Please check with and refer to the polar chapter's discussion of traditional observations and knowledge. (Kristie L. Ebi, IPCC WGII TSU)	???
718	39145	2	30	32	30	36	This is an important point: adaptation is and needs to be local, and one strategy will not suit every locality even if some strategies will be widely useful. Diversity is thus an asset when it comes to adaptation, and it reduces overall vulnerability within populations. Yet we are losing diversity everywhere (diversity of cultural for example) due to unequal power relations. It is a recipe for systemic collapse. (Thomas Reuter, University of Melbourne)	included partially
719	47217	2	30	35	30	36	Endfield (2011) consequently argues for a 'reculturing and reparticularizing …'. More explanations of what are these 2 concepts are necessary (Diane Chaumont, Ouranos)	thanks for add. Literature;
720	52989	2	30	38	30	43	Frames and culture were discussed previously; please combine. (Kristie L. Ebi, IPCC WGII TSU)	deleted

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
721	45733	2	30	48	30	48	...climate science has to become...' I would argue that there is a need for science (natural, social and engineering sciences) that needs to be in place and as such, the science needed is more than can be offered by climate science. There is a need for the involvement of the climate science community, but a a partner not necessarily the lead. (Roger Street, UK Climate Impacts Programme)	changed
722	43895	2	31	0	0	0	Section 2.3.4. I feel a critical aspect that needs to be mentioned in the NRM section which is currently omitted, is that existing approaches to IWRM and SFM may need (are likely to need) to identify when to allow/promote system transformation to align with and keep in step with climate changes (as opposed to maintaining existing ecosystem functions and services). this is critical considering the projections of >2 to 3 warming. (Russell Wise, CSIRO)	transformation is a difficult topic; there is a brief placeholder in 2.4.3; but need additional information/literature
723	40721	2	31	1	0	35	It isn't clear why this section on Natural Resource Management was in this chapter on foundations for decision-making. Is the point that this is an area in which climate change is important and therefore decisions about it need to include climate services and decision support? (Karen Hardee, Futures Group)	2.3.4, 2.3.5 and 2.3.6 are examples of issue-based platforms for decision making in practice, beyond 'generic' consideration of institutions and people who make decisions; IWRM and SFM are examples of decision-making paradigms that have emerged from natural resources management as a whole, offering a particular slice at the issue of decision making that could offer insights for other sectors; perhaps a statement on this can be added to page 4 line 42-43; and an introductory sentence specifically for 2.3.4 on page 31, line 3
724	52990	2	31	1	34	35	Why is only one sector discussed? I suggest deleting and referring to relevant sections of the adaptation chapters. (Kristie L. Ebi, IPCC WGII TSU)	see comment 723; reference to chapters 3 and 4 are already included in line 35
725	50000	2	31	3	31	16	The author team should consider presenting further citations in support of the statements made in these paragraphs. (Katharine Mach, IPCC WGII TSU)	agreed; see response to comments 723, 726-728
726	46008	2	31	18	31	19	While it is true that increasiong water resources management challenges gave origin to concepts like IWRM, it may be misleading to attribute this to the need to incorporate climate change impacts. This concept is decades old (see for example Snellen and Schrevel, 2004 and Garcia, 2008). (Luis E. Garcia, World Bank)	there was no intent to say that IWRM has emerged because of climate change; have obtained copy of Garcia (2008) and will review it, and other selected titles on IWRM, in collaboration with chapter 3
727	41156	2	31	18	31	20	Section 2.3.4 Pg 31 line 18-20 - In addition to IWRM and SFM, another new concept in natural resource management emerging is that of resilience assessments. The following report presents a methodology (tool) for assessing Arctic ecosystem resilience, which focuses on identifying places of strength and durability that support ecological resilience vs places of vulnerability. The premise behind this approach is – ecosystems that benefit from local sources of strength and durability are likely better than others at enduring environmental shocks and surprises, and thus would adapt better under conditions of rapid change. Christie P, Sommerkorn M. 2012. RACER: Rapid Assessment of Circum-arctic Ecosystem Resilience, 2nd Ed. Ottawa, Canada: WWF Global Arctic Programme. 72 p. (Susan Evans, WWF-Canada)	can cite RACER document; also link to resilience discussion in 2.4.2
728	47749	2	31	20	31	20	Sustainable forest management is not a "new" concept nor was it initially expressly linked to climate change (a search in Google scholar will return mulitple articles and books discussing sustainable forest management in the 1990's and early 2000's). Also, see articles from 1992 describing the USDA Forest Service's new approach commonly labeled "New Perspectives" based on these articles (Kessler, W. et al. 1992. New perspectives for sustainable natural resources management. Ecological Applications. 2(3): 221-225. and Swanson, F.J., and J.F. Franklin. 1992. New forestry principles from ecosystem analysis of Pacific Northwest Forests. Ecological Applicaitons 2: 262-274.) (Eric Toman, The Ohio State University)	there was no intent to say that SFM has emerged because of climate change; however, the report by Seppala et al is an extensive global review of literature, and has concluded that the forest sector as a whole has been slow to adopt SFM; agree to add more references on history of SFM, as well as on other aspects of decision making including criteria and indicators, values, and decision support, in collaboration with chapter 4
729	46009	2	31	20	31	23	It may be useful to mention that there is quite a substantial bibliography about IWRM besides the two references mentioned. Examples of these can be found in the UN Water and GWP web pages http://www.un.org/waterforlifedecade/iwrm.shtml and http://www.gwp.org/ (Luis E. Garcia, World Bank)	see comment 726; will check out references on this website

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
730	40722	2	31	38	32	53	This section on climate action plans could be tied better to the topic of the chapter – what is it about climate action plans, such as NAPAs that relate to decisions, decision-makers, decision support and climate services? The section says that NAPAs are decision-making tools, but doesn't discuss and analyze the decision-making process around NAPAs. The section on NAPAs simply describes them – it would be better to include some analysis, which many authors have done, on how they have been implemented (the lack of wide participation, the slowness of getting them approved and projects actually started, the lack of resources for them, etc.) That analysis could be tied back to the realm of decision-making – all the decision points along the way, who is involved (global, national, subnational), and how those were supposed to be plans to address immediate concerns, yet a decade later, most were still not being implemented. The NAPA process/example provides a good illustration of the difficulty in climate change decision-making on programming. By all accounts those should have been in the "tame" category of decisions – programs for the least developed countries to get immediate relief from impacts that were determined in a participatory manner by countries. And yet, they also ended up more in the "wicked problem" category. I assume someone has done an analysis of why some NAPAs moved quickly and others did not. Are there any lessons there about more effective decision-making regarding climate change programming in some countries compared to others? Was the process smooth in some countries and contentious in others? Was there full participation of a range of stakeholders in some countries and not in others? You could include Hardee, K and C Mutunga. 2009. "Strengthening the Link Between Climate Change Adaptation and National Development Plans: Lessons from the Case of Population in National Adaptation Programmes of Action (NAPAs)." Mitigation and Adaptation Strategies for Global Change. 15(2), 113-126 to show the difficulty in decision-making when different ministries in the government are responsible for climate change (ministries of meteorology or environment) and development (ministries of planning). (Karen Hardee, Futures Group)	Section removed and folded into section 2.3.4
731	52991	2	31	38	34	4	It is unclear why these sections are in this chapter. The issues raised are discussed in the adaptation chapters. It would be appropriate to include insights from the adaptation chapters on risk and decision making in this chapter. (Kristie L. Ebi, IPCC WGII TSU)	Section removed and folded into section 2.3.4
732	50001	2	31	40	32	25	The author team may wish to consider material in Chapter 14, coordinating treatment or providing cross-reference, for these paragraphs. (Katharine Mach, IPCC WGII TSU)	Section removed and folded into section 2.3.4
733	47917	2	32	0	0	0	Suggest putting the examples in a box and confining the text to a general description of some processes by which priorities can be identified. (Jenny Frankel-Reed, USAID)	Section removed and folded into section 2.3.4
734	43896	2	32	1	32	1	It would be informative and useful for readers to know what the "importance" was based on. (Russell Wise, CSIRO)	Section removed and folded into section 2.3.4
735	50002	2	32	3	32	4	The author team should consider and revise the formulation of this sentence to avoid potential interpretations of policy prescriptiveness. (Katharine Mach, IPCC WGII TSU)	text removed
736	54194	2	32	3	32	5	Please consider rephrasing to avoid possible interpretation as policy prescriptive. (Michael Mastrandrea, IPCC WGII TSU)	Text removed
737	41446	2	32	27	32	34	the section should also include a brief part on National Adaptation Plans, a process recently initiated under the UNFCCC (see http://unfccc.int/adaptation/cancun_adaptation_framework/national_adaptation_plans/items/6057.php) (Sven Harmeling, Germanwatch)	See section 2.3.4
738	50003	2	32	38	32	49	The author team may wish to cross-reference findings from other chapters in support of statements made here on lines 38-39 and 48-49. (Katharine Mach, IPCC WGII TSU)	Some cross referencing, more will be added
739	47918	2	33	2	0	0	2.3.6 – Should mention the importance of situating local decisions in a broader context, e.g. seeking to harmonize or at least reduce conflict with decisions made for other purposes or at other scales. This is often a challenge in the context of decentralization, institutional competition, and unclear national/sub-national jurisdiction issues. (Jenny Frankel-Reed, USAID)	agreed; see comment 747
740	35509	2	33	2	34	4	Aside of institutional responses to climate change, it is important to note the emergence of a climate movement both within various countries and internationally. See Chapter 8 on 'Grassroots responses to climate change: internationally, nationally, and locally in my recent book (Baer 2012). (Hans Baer, University of Melbourne)	very much appreciate this comment, and will add citations to recent literature from anthropology on local responses, including the Baer reference (if copy can be obtained; or cite Baer 2012 - American Anthropologist, vol. 114), and reference on 'reception studies', i.e. how local communities receive and act on climate change information (Rudiak-Gould, 2011); do not anticipate reviewing global development scenarios in this section, though reference to new Shared Socioeconomic Pathways associated with new emission scenarios could be added to 2.3.2
741	35511	2	33	2	34	4	Baer, Hans A. 2012. Global Capitalism and Climate Change: The Need for an Alternative World System. Lanham, MD: AltaMIra Press. (Hans Baer, University of Melbourne)	see comment 740
742	35512	2	33	2	34	4	Gallopin, Gilberto et al. 1997. Global Scenarios and Human Choice: A Resource Paper of the Global Scenario Group. Stockholm Environmental Institute. (Hans Baer, University of Melbourne)	see comment 740
743	35513	2	33	2	34	4	Hammond, Allen. 1998. Which World: Scenarios for the 21st Century. Washington, DC: Island Press. (Hans Baer, University of Melbourne)	see comment 740
744	35514	2	33	2	34	4	Kempton, Wilet et al. 1995. Environmental Values in American Culture. Cambridge, MA: MIT Press. (Hans Baer, University of Melbourne)	see comment 740
745	35510	2	33	2	34	4	References for above comments: (Hans Baer, University of Melbourne)	see comment 740

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746	35515	2	33	2	34	4	Sale, Peter F. 2011. Our Dying Planet: An Ecologist's View of the Crisis We Face. Berkeley: University of California Press. (Hans Baer, University of Melbourne)	see comment 740
747	48067	2	33	4	33	7	Cities have taken a leading role e.g. ICLEI, C40 Mayors. See also Urban Climate Change Research Network report (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	ICLEI Oceania (2008) already cited on line 46; will look for additional reference from UCCRN as suggested, likely the Rosenzweig et al. (2011) report "Climate Change and Cities" which includes discussion on risk framework and governance
748	46690	2	33	16	33	23	The LACC project has actually focused on the various vulnerable livelihood groups in the Northwestern drough prone districts of Bangladesh and then in the later phases on the Coastal zones of Bangladesh. The northern part of the country remained critically vulnerable to droughts and the southern coastal zone was vulnerable to multiple coastal hazards including salinity, sedimentation, waterlogging etc. For details please refer to: http://www.fao.org/climatechange/laccproject/en/ (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	will update description of LACC project [SJC, MM?]
749	54692	2	33	25	33	32	The author team wish to make the discussion on 'enabling factors' and 'drivers' more prominent and coordinate with chapters like 14, 15, 16, 8 on the consistent and extensive use across chapters. (Monalisa Chatterjee, IPCC WGII TSU)	agreed; will coordinate with Chapters 14, 15, 16, 8
750	54193	2	33	27	33	32	The term "drivers" is predominantly being used in other ways in the report in the context of climatic and nonclimatic drivers of change. Please consider distinguishing the usage here. (Michael Mastrandrea, IPCC WGII TSU)	yes, this is referring to drivers of adaptation decision making; see comment 749
751	48903	2	33	30	0	0	champions' … having worked with communities in local response development, my observation is that unless 'champions' are designated and appropriately resourced, their capacity to facilitate on-going adaptation planning falls away due to the pressure of other demands (Leon Soste, Department of Primary Industries, Victoria, Australia)	will include this concern if reference can be found to support it
752	48068	2	33	49	33	54	Other work on visualisation has been undertaken by the University of East Anglia (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	Sheppard (2012) is a major work reviewing available literature on visualization; expect that UEA work (e.g. Dockerty et al., 2006) would be included
753	40723	2	34	2	34	4	The section on local responses should include mention of community-based adaptation and how it works and has grown over the past several years. It could also include examples of the work of organizations ranging from UNDP to WRI and CARE – and many others. CARE, for example, has done a lot of work to ensure that women are among the stakeholders in adaptation planning Page 25, line 25 notes that comprehensive participation of stakeholders is essential, but doesn't give any examples. Gender could be an example. Another issue at the country level is that climate as historically been the purview of ministries of meteorology or the environment – neither of which have much depth in the social sciences and human behavior. In that context, "full participation" is critical and needs to be well-defined. Participation of who? Who decides what full participation means? Should it mean the same things in all countries? (Karen Hardee, Futures Group)	will include additional text on community-based adaptation; can add citation for CARE International in Viet Nam -- Mainstreaming Climate Change Adaptation document (2009) and the CARE (2012) PMERL Manual (Participatory Monitoring, Evaluation, Reflection and Learning for Community-based Adaptation); also, can link further with text on indigenous communities on lines 34-41, with additional citation of Nakashima et al (2012) -- "Weathering Uncertainty", which is a, global review on climate change impacts and adaptation pertaining to indigenous communities; would suggest inserting earlier in 2.3.6; can also cite case of irrigation in Australia from comment 433
754	50004	2	34	7	0	0	Section 2.3.7. For conclusions presented in this section, the author team is encouraged to characterize its degree of certainty in the assessment findings through use of calibrated uncertainty language. Summary terms for evidence and agreement and levels of confidence may be particularly appropriate. (Katharine Mach, IPCC WGII TSU)	This section has been removed
755	54195	2	34	7	0	0	Section 2.3.7: This section should include cross-references back to previous chapter sections from which it is synthesizing information. In addition, as I commented at the outset of the chapter, this section could provide an opportunity to present further explanation of synthetic findings that would appear in the Executive Summary. (Michael Mastrandrea, IPCC WGII TSU)	This section has been removed and such findings can now be found in 2.3.1
756	40725	2	34	7	0	48	It isn't clear what this section is synthesizing. (Karen Hardee, Futures Group)	This section has been removed
757	40724	2	34	9	0	0	"All decisions involving valued outcomes and uncertainty are risk assessments." Shouldn't that say that "all decisions….involve risk assessments? Or "include risk assessments" or "are based on explicit or implicit risk assessments?" (Karen Hardee, Futures Group)	This discussion is now at the beginning of the chapter in section 2.1
758	52992	2	34	9	34	9	This sentence says that risk assessments are decisions, which is not necessarily true. Assessments are conducted to inform decisions, which decisionmakers then combine with social preferences and other factors when making a decision. (Kristie L. Ebi, IPCC WGII TSU)	Text removed
759	52993	2	34	12	34	12	As mentioned previously, a critical issue mostly missing from this chapter is a discussion on iterative risk management, including experiences and recommendations. There also could be a discussion of the implications of changing climate and socioeconomic conditions for monitoring, evaluation, etc. (Kristie L. Ebi, IPCC WGII TSU)	Now at the beginning of the chapter
760	47474	2	34	13	34	13	Explain 'reflexive models' again, as a synthesis should be self-contained. (Hermann Held, University of Hamburg)	Text removed
761	52994	2	34	21	34	26	This sounds like a key finding that could be included in the Executive Summary. (Kristie L. Ebi, IPCC WGII TSU)	Done and supporting text is earlier
762	40698	2	34	22	34	22	The term "information-gap model" bears the potential of being confused with "information-gap decision theory" (Ben Haim, Y., 2001) that is also cited in the chapter. I would recommend dropping this term in favor of a formulation such as: "Traditionally CCIAV assessments have been dominated by rational science-driven models that assume that better science will lead to better decisions." (Florian Hartig, Helmholtz-Centre for Environmental Research - UFZ)	Introduced earlier and nomenclature explained

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763	47180	2	34	23	34	26	Key 'participatory' approaches include the co-production of new knowledge through collaboration between indigenous knowledge holders and scientists. In the Arctic, remote sensing and other scientific methods are being combined with the indigenous knowledge of Sami and Nenets reindeer herders to co-produce datasets to improve decision-making, herd survival and adaptation strategies in the face of climate change (Maynard et al., 2005). Other examples of indigenous-scientific knowledge co-producation are presented in Nakashima et al (2012: 66-67). Maynard, N.G., Yurchak, B.S., Sleptsov, Y.A., Turi, J.M. and Mathiesen, S.D. 2005. Space Technologies for Enhancing the Resilience and Sustainability of Indigenous Reindeer Husbandry in the Russian Arctic, Proceedings of the 31st International Symposium on Remote Sensing of Environment, Global Monitoring for Sustainability and Security. 20–24 June 2005. St. Petersburg, Russia; Nakashima, D.J., Galloway McLean, K., Thulstrup, H.D., Ramos Castillo, A. and Rubis, J.T. 2012. Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. Paris, UNESCO, and Darwin, UNU, 120 pp. (Douglas Nakashima, UNESCO)	Text removed
764	35825	2	34	26	0	29	This discussion focuses only on deliberation as a social psychological process that takes place in small groups. This ignores the highly developed empirical literature about the role of deliberation in democratic societies, and the role of the structure of government institutions in shaping public deliberation at the national level. This literature shows how democratic deliberation is systematically distorted and allows certain elites to continue to pursue their narrow interests, to the detriment of the public good, including allowing the acceleration of climate change. This literature is very well developed in both political science and sociology, and I feel it should be integrated into the discussion. See the following references as an entry point into this literature: Brulle, Robert J. 2000. Agency, Democracy, and Nature, MIT Press, Chapters 2-4 Habermas, Jürgen. 1996. Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy. MIT Press. (Robert Brulle, Drexel University)	We have added a small amount of this material but need more
765	54693	2	34	41	34	48	The chapter team may wish to coordinate with other chapters to determine how this process of translation has happened in each case and add a broad overview section for the report here. (Monalisa Chatterjee, IPCC WGII TSU)	Will consider for government draft
766	40890	2	34	42	0	0	Consider whether knowledge transfer might be replaced with the term knowledge co-creation (Regeer, B. and J. Bunders 2009 Knowledge co-creation: Interaction between science and society. Den Haag, The Netherlands: RMNO (Advisory Council for Spatial Planning, Nature and the Environment) which is a much more dialogic approach than hierarchical transfer; Lejano, R., & H. Ingram. 2009. "Collaborative networks and new ways of knowing: The CALFED experience" in Environmental Science and Policy 12(6), 653-662. (Lynn Wilson, SeaTrust Institute)	Point taken, but we cannot address every case of proposed new nomenclature
767	47965	2	35	0	0	0	Section 2.4 could be linked with or integrated within tthe Chapter 20, in the current form it introduces unnecessary redundation (Jaroslav Mysiak, Fondazione Eni Enrico Mattei; and Euro-Mediteranean Center for Climate Change)	agree that there should be coordination with Chapter 20 (reference to Chapter 19 in line 33 will be corrected); will add material to link the trade-offs described here with the discussion on Figure 2-1 (page 3), and attributes in 2.3.1, such as contextual attributes, discussed in 2.3.1.3, in which adaptation could be linked with other processes managing sustainable development (page 24, lines 12-21)
768	44260	2	35	0	0	0	Section 2.4 It is not very clear, how this section is fundamentally important for the overall topic of „Foundations of decision making“. Probably an short reference to Chapter 20 may be sufficient to cover the foundations of decision making (Dominik Reusser, Potsdam Institute for Climate Impact Research)	see comment 767
769	40726	2	35	1	0	36	It isn't clear what this section on linking adaptation with mitigation and sustainable development has to do with the topic of the chapter. (Karen Hardee, Futures Group)	see comment 767
770	52763	2	35	3	0	0	section 2.4.1. Again (like the equivalent section in chapter 1), the discussion of linkages between mitigation and adaptation lacks much depth, feels as though it has been tacked on at the end of the chapter. (Tim Rayner, University of East Anglia, Tyndall Centre for Climate Change Research)	see comment 767
771	52995	2	35	3	35	36	This topic is covered in chapter 20; it would be much better to either delete, or refer to the relevant sections of chapter 20 to discuss the relevance of trade-offs for decision-making. Most of the references cited are several years old. (Kristie L. Ebi, IPCC WGII TSU)	see comment 767
772	47475	2	35	10	35	15	This § reads confusing, because in its center you omit adaptation and write merely about 'avoided damages' vs. 'mitigation costs'. Any CBA on that would reveal that you would want SOME mitigation at least. (Hermann Held, University of Hamburg)	this paragraph summarizes AR4 result on case studies of tradeoffs between mitigation and damages avoided, since mitigation-adapatation tradeoffs were not assessed (lines 13-15); this means that there is a research need to more explicitly assess adaptation-mitigation tradeoffs, (lines 17-28); will coordinate with chapters 16 and 20
773	48069	2	35	22	35	28	Shadow cost now built into aspects of UK public policy decision making (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	will cite 2009 reference on carbon valuation from UK Department of Climate and Energy
774	46947	2	35	24	35	25	Social cost estimates available for review by the AR4 were highly uncertain, ranging from US$-10 to US$+350 per tonne of carbon' this is a clear illustration of the difficulties or even irrationality of using or imposing conventional economics as the dominant process to decide climate policy. (Mark Charlesworth, Keele University)	there is no inference that this calculation is or should be the dominant process to determine climate policy; it offers a measure of illustration of synergies between emissions and impacts, which could enable an assessment of tradeoffs between mitigation and adaptation; however, Social Cost is no longer being used for this purpose (see comment 773)

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
775	52996	2	35	27	35	28	Low social costs of carbon do not suggest high adaptive capacity. High adaptive capacity is not directly correlated with the magnitude and extent of impacts. Either provide a more nuanced discussion relevant for decisionmaking, or delete. (Kristie L. Ebi, IPCC WGII TSU)	will revise statement on high adaptive capacity
776	46691	2	35	39	0	0	Section 2.4.2: More elaborated discussions should also be done and particularly with a linkage to Disaster Risk Management (DRM) and extreme events that are significantly increased in various parts of the world. There are scopes of seeing of the discussion on resilience in this line as well. There are also multiple new connotations such as 'Climate Smart Disaster Risk Management (CSDRM) has also emerged lately which can be referred in a unique way, More on CSDRM can be found at: http://www.csdrm.org (Atiq Kainan Ahmed, Asian Disaster Preparedness Center (ADPC))	agreed; will add citation for CSDRM (Mitchell et al., 2010) which describes application of the Strengthening Climate Resilience Programme
777	40727	2	35	39	36	38	This section on linkages with sustainable development – resilience isn't sufficient to cover the topic. Since it is well-covered in Chapter 20, suggest either deleting it here, or mentioning Chapter 20 and stress here how it links to decision-making (Karen Hardee, Futures Group)	will cite chapter 20; also, see comments 776, 780 and 782
778	52997	2	35	49	35	52	This is the problem with the term resilience -- there are many, many instances where returning to the current state would not be adaptive to climate change, such as rebuilding on coastal areas prone to flooding from storm surges. (Kristie L. Ebi, IPCC WGII TSU)	the definition used in Chapter 20 (and SREX) does not specify what the 'end' would look like, only that resilient refers to process (anticipate, reduce, cope, respond, recover); the desired 'end' is about making the system stronger than it was before, while still accomplishing the same goals (shelter, supply chain security, etc.); 2.4.2 line 52 says 'maintain the same identity', which does not suggest returning to the current state of pre-existing vulnerability; also see comment 779
779	47750	2	35	51	35	52	The follow up sentence here that begins, "In other words…" doesn't contribute to the clarity of the concept of resilience (Eric Toman, The Ohio State University)	will add language on resilience from disaster risk management and supply chain management perspectives; see comment 777
780	37662	2	35	52	0	0	I think there needs to be some quantitative discussion of resilience. Add(?): U.S Department of Homeland Security concerns for infrastructure resilience to natural and manmade disasters has resulted in methods to determine the cost, characterization, timing, and benefits of resilience (Vugrin et al 2011, Vugrin and Camphouse, 2011). Extensions of this work include the estimation of the resilience costs and benefits under uncertainty such as that associated with climate change (Vugrin and Turnquist, 2012). [Vugrin E.D., D.E. Warren, and M.A. Ehlen, 2011: A resilience assessment framework for infrastructure and economic systems: Quantitative and qualitative resilience analysis of petrochemical supply chains to a hurricane. Process Safety Progress, 30(3), 280–290 DOI: 10.1002/prs.10437] [Vugrin E.D., R.C. Camphouse, 2011. Infrastructure resilience assessment through control design. International Journal of Critical Infrastructures, 7(3)243 - 260. DOI: 10.1504/11.42994] [Vugrin, E. and M.A. Turnquist, 2012: Design for Resilience in Infrastructure Distribution Networks. Sandia National Laboratories. Report SAND2012-6050 Albuquerque, NM. Available at: http://www.sandia.gov/CasosEngineering/docs/Vugrin_resilient_design_2012_6050.pdf] (George Backus, Sandia National Laboratories)	thank you for offering specific examples of resilience assessment related to infrastructure supporting supply chains; will cite hurricane case (Vugrin et al., 2011)
781	48070	2	36	1	36	15	It is not clear what demonstrates resilience (Geoff Darch, Atkins (Visiting Lecturer at UEA, Industrial Supervisor at UCL))	will cite chapter 20; also, see comments 776, 780, and 782
782	48004	2	36	1	36	15	The emphasis on a single instance of capacity building to promote resilience seems out of place when there are others (e.g. Climate and Disaster Resilience Initiative through UNISDR; IFRC Clmate Change preparedness in Nicaragua; etcetera) (Patricia Jacobberger-Jellison, NASA)	thank you for identifying examples of resilience assessment through UNISDR; will cite the 'Making Cities Resilient' report (2012), and review of the Hyogo Framework for Action
783	44261	2	36	17	36	22	This shift in management paradigm and its effect on decision making (foundations) should probably be discussed early on in the chapter, as the management paradigm affects methods used for decision making and is thus funadmentally important (Dominik Reusser, Potsdam Institute for Climate Impact Research)	will consider adding some text identifying resilience as a topic in this chapter, at page 4 lines 43-44 [SJC, RJ? AP?]
784	41157	2	36	19	36	20	Section 2.4.2 Pg 36 line 19-20 - mentions the paradigm shift from exploitation to stewardship in the renewable resources sector. I would also make reference to this paragraph or paradigm shift under section 2.3.4 - Natural Resource Management. (Susan Evans, WWF-Canada)	see comment 727; can include Chapin reference in 2.3.4
785	47751	2	36	19	36	21	Does this statement about renewable resource management hold up in the developing world (or even in the developed world…see recent expansion in mining in Australia and hydraulic fratcuring in the U.S.)? (Eric Toman, The Ohio State University)	will look for reference on how the framework for an ecosystem stewardship approach to renewable resources management is being challenged by competing development interests, and implications for decision making on adaptation
786	52998	2	36	26	36	28	And what is the use of these categories for decisionmaking? (Kristie L. Ebi, IPCC WGII TSU)	will see if cited references can address this
787	50005	2	36	41	0	0	Section 2.4.3. This section would benefit from further development by the second-order draft. (Katharine Mach, IPCC WGII TSU)	Section has been expanded
788	40728	2	36	41	0	0	The idea of transformation is only introduced at the very end of the chapter and it isn't well defined, as it is in Chapter 20. If this concept is meant to be foundational for this chapter, suggest that it be introduced earlier in the chapter. (Karen Hardee, Futures Group)	Section has been expanded
789	39496	2	36	41	36	49	Perhaps address this as an emerging discourse - it embeds a 'systems' perspective - where entities (firms, communities, economic systems etc) undergo some internal dynamic change that results in a new configuration. Perhaps ask what this systems framing adds to conventional understanding of adaptation. There are a few studies of the transition movement that might be useful here - the belief is that a conscious managed transition will lead to a postive desirable transformation, when the alternative is an unmanaged crisis shift in the system/regime. (Sarah Cornell, Stockholm Resilience Centre)	This context needs to be made clearer

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
790	49028	2	36	41	36	49	This important section should be reassessed and rewritten. It is not good enough to write "This field seems to be very recent and lacks relevant litterature". A whole section of the SREX SPM and underlying report discusses transformation processes. (Oyvind Christophersen, Climate and Pollution Agency)	Section expanded
791	43897	2	36	41	36	49	This is disappointingly short and poorly addressed. There is substantial learning that can be drawn upon from the socio-technical transitions literature in order to inform adaptation planning and decision making under uncertainty and complexity . See for example: Cox, M. 2011. Advancing the diagnostic analysis of environmental problems. International Journal of the Commons 5 (2): 346 - 363 Duita, A., Galaza, V., Eckerberga, K., and Ebbessona, J. 2010. Governance, complexity, and resilience. Global Environmental Change 20: 363–368. Geels, F.W. and Schot, J. 2007. Typology of sociotechnical transition pathways. Research Policy 36: 399–417. Park, S.E., Marshall, N.A., Jakku, E., Dowd, A.M., Howden, S.M., Mendham, E., and Fleming, A. 2012. Informing adaptation responses to climate change through theories of transformation. Global Environmental Change 22 (1): 115-126. Rotmans, J. and Loorbach, D. 2009. Complexity and Transition Management. Journal of Industrial Ecology 13 (2): 184 - 196 Smith, A. and Stirling, A. 2010. The politics of social-ecological resilience and sustainable sociotechnical transitions. Ecology and Society 15 (1): 11. van den Bergh, J. and Kemp, R. 2006. Economics and Transitions:Lessons from Economic Sub-disciplines, Maastricht, The Netherlands, United Nations University. Vasileiadou, E. and Safarzyńska, K. 2010. Transitions: Taking complexity seriously. Futures 42 (10): 1176-1186. (Russell Wise, CSIRO)	These references need to be added in the next version and assessed
792	47752	2	36	41	36	49	Unless more is added to this final subsection (2.4.3) I suggest leaving it out. (Eric Toman, The Ohio State University)	Section expanded
793	45734	2	36	43	36	44	Need to broaden this (or at least recognise the need to broaden this) to consider more than just firms - insitutions and communitie (Roger Street, UK Climate Impacts Programme)	Section expanded
794	44262	2	36	48	36	49	„This field seems to be very recent and lacks relevant literature“ is not true if field refers to „decisions involving transformations. See literature on transition management and other references to be found in a collection on sustainability transitions: http://www.mendeley.com/groups/1472313/sustainability-transitions/ (Dominik Reusser, Potsdam Institute for Climate Impact Research)	Section expanded
795	52999	2	36	48	36	49	Please delete. For a discussion of transformations, please refer to chapter 20. (Kristie L. Ebi, IPCC WGII TSU)	We have been asked to put this in according to the original contents
796	50006	2	36	52	0	0	Frequently Asked Questions -- Frequently Asked Questions should be fully developed by the second-order draft, as they are an important (and required) component of each chapter. (Katharine Mach, IPCC WGII TSU)	Still to be added - we are not sure what the FaQs actually are
797	36950	2	37	30	37	51	This is a good paragraph. Since the ESPACE project is quoted, it could considered to also quote the BaltCICA project (www.baltcica.org). This project has sucesfully elaborated adaptation concepts in close cooperation with stakeholders, several of which are currently being implemented. Investments have been carried out and land use modifications are being implemented. Quote also: Schmidt-Thomé, P., Klein, J. 2011. Applying Climate Change Adaptation in Spatial Planning Processes. In: Schernewski, G., Hofstede, J., Neumann, T. (eds): Global Change and Baltic Coastal Zones, Coastal Research Library-Series, Springer, Dordrecht, Vol. 1, pp 177-192. And: Schmidt-Thomé, P; Klein, J.; Satkunas, J. 2010. Climate change, impacts and adaptation – some examples of geoscience applications for better environmental management in the Baltic SeaRegion. Episodes, 33/2, 102-108. More recent examples are from Finland, Estonia, Latvia, Lithuania, Germany and Denmark. In case the authors would be interested I could contribute some sentences on theses measures (Iam already a co-author of this chapter). The results are currenlty being published (submitted, reveiwed and accepted) but the printed versions will be available only in the end of 2012. (PHILIPP SCHMIDT-THOMÉ, GEOLOGICAL SURVEY OF FINLAND)	Not for this chapter
798	41323	2	38	46	39	2	Do these two entries refer to the same reference? (Gisela Böhm, University of Bergen)	Reference fixed
799	43894	2	39	1	40	1	Poorly worded sentence. (Russell Wise, CSIRO)	Not sure what this refers to - in the references
800	45735	2	51	0	0	0	Need for more clarity as to what the numbers in the table actually mean. (Roger Street, UK Climate Impacts Programme)	Table removed
801	53000	2	51	0	0	0	Please define acronyms. (Kristie L. Ebi, IPCC WGII TSU)	Table removed
802	40729	2	51	0	0	0	Table 2.1: This table is not intuitive and needs more explanation if it is retained. (Karen Hardee, Futures Group)	Table removed
803	41148	2	51	0	0	0	Table 2-1 Pg.51 - It is not clear from the caption what this table is trying to communicate (e.g. why are these studies being compared across the selected characteristics?). Clarity is needed. The expanded description of the table in the body of the text (Pg 10 lines 13-26) is useful, but it may benefit the reader and provide clarity if the “cascade of uncertainty” referred to was defined (either listed or shown in a schematic). (Susan Evans, WWF-Canada)	Table removed
804	50007	2	51	0	0	0	Table 2-1. The author team, in the caption for this table, should further specify the nature of the "climate change impact studies" included--why are these particular studies characterized and not others, that is? Within the table itself, it would be helpful to clarify what the abbreviation "w/u" stands for. (Katharine Mach, IPCC WGII TSU)	Table removed
805	53891	2	51	0	0	0	Table 2-1: All abbreviations in the table should be spelled out in caption. Perhaps, it would be helpful to further clarify what each category (row header) is showing. (Yuka Estrada, IPCC WGII TSU)	Table removed
806	40730	2	52	0	0	0	Table 2.2: This table shows adaptive management response – but doesn’t say anything about the decision-making that went into coming up with these responses. This table, if retained, will benefit from more explanation. (Karen Hardee, Futures Group)	Table removed

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
807	38209	2	53	0	0	0	Figure 1. Figure 1 did not help me understand the structure of the review. It points out ideas covered but it was not clear. As noted above, I did not clearly see distinctions amoung the levels of analyses highlighted. They were present but intermixed without particular comments about the meaning of the different levels or the relations amoung the levels. Some levels were not clearly addressed (e.g., group decision making). When referring to communities, this is distinct from individuals and small groups but I'm not sure if the reviewers are thinking of them as insitutions or systems, but communities doesn't seem to fit this either. The ovals around the triangle don't seem to make conceptual sense. Why are they linked? The cognition-behavior oval seems to be about individual level analyses. I did not see a clear discusion of behavior in the review. I don't see that cognition-behavior was tied to the other areas reviewed. This is as much a problem with the figure as it is with my ability to detect key features in the review and research that appeared to be missing. (Janet Swim, The Pennsylvania State Universi)	Figure removed
808	40731	2	53	0	0	0	Figure 2.1: This is an important figure for this chapter, but it doesn't quite work. For example, how do systems make decisions? I suggested earlier having a table with types of decision-makers and the types of decisions they make. In this figure, I couldn't quite see what the external boxes and the circle around them mean. The boxes seem to be apples and oranges (e.g. "scenarios" are produced, and "implement and review" is something that decision-makers are supposed to do. "Socio-cultural aspects" are factors that affect decision-making). If this figure is retained, it should be reworked. (Karen Hardee, Futures Group)	Figure removed
809	48722	2	53	0	0	0	Figure 2.2 is remarkably reminiscent of the adaptive management cycle. It would be good to discuss somewhere how the iterative risk management framework discussed in this chapter relates to other well-known iterative decision frameworks like AM. (Jennifer Hoffman, EcoAdapt)	This has been expanded in the chapter
810	40732	2	53	0	0	0	Figure 2.2: Good, understandable, although a citation is needed. (Karen Hardee, Futures Group)	Done
811	53892	2	53	0	0	0	Figure 2-1 : It would be more helpful for the audience to have some visual depiction of how the hierarchy of decision makers and subject groups are interacting as well as how the subject groups interact with each other. It would be better to use a different color scheme as it gives an impression that the same colors used (e.g, Scenarios and Systems) may have some common factors. (Yuka Estrada, IPCC WGII TSU)	Figure removed
812	50008	2	53	0	0	0	Figure 2-1. It would be helpful to further clarify why "individuals to groups" are mentioned in the figure caption, while the center of the figure itself also includes institutions and systems. (Katharine Mach, IPCC WGII TSU)	Figure removed
813	54156	2	53	0	0	0	Figure 2-1: The figure caption could better explain all elements of the figure, to aid understanding. (Michael Mastrandrea, IPCC WGII TSU)	Figure removed
814	44170	2	53	0	0	0	Figure 2-1: This figure is not clear: how do the boxes relate to the entities in the pyramid? The figures mixes both scientific tools with goals, which causes confusion. Is the circle meant as a temporal cycle? (Anne Holsten, Potsdam Institute for Climate Impact Research)	Figure removed
815	50009	2	53	0	0	0	Figure 2-2. The author team should further develop the caption for this figure to provide a guide for the reader in interpreting the concepts and processes depicted. (Katharine Mach, IPCC WGII TSU)	Done
816	45736	2	53	0	0	0	Figure 2-2: Evaluate tradeoffs, conflicts and the potential for synergies. Rather than monitor and reassess, as per earlier suggestion may which to be consistent within the chapter and with other literature to use monitor and evaluate (or at least be consistent with the language used within the text monitor, measure and review / evaluate) (Roger Street, UK Climate Impacts Programme)	Some lable changes have been made
817	53893	2	53	0	0	0	Figure 2-2: It would be helpful to identify and label different stages (right circle as "assessment stage" and left circle as "management stage"). (Yuka Estrada, IPCC WGII TSU)	In caption
818	54161	2	53	0	0	0	Figure 2-2: The figure caption should explain all elements of the figure, so that it can stand alone. (Michael Mastrandrea, IPCC WGII TSU)	Caption expanded
819	54179	2	53	0	0	0	Figure 2-3: Again the figure caption should explain all elements of the figure, so that it can stand alone. (Michael Mastrandrea, IPCC WGII TSU)	Figure removed
820	41877	2	53	0	53	0	Figure 2-1. This figure is quite difficult to understand. Firstly, which part is directly related to climate change? Secondly, the corner of the triangle in the center is connected to the boxes of "Adaptation, Mitigation and Sustainable Development", "Cognition-Behavior" and "Socio-Cultural Aspect", respectively. Does this connection have proper meaning? Particularly, this figure suggests the main player for the "Adaptation, Mitigation and Sustainable Development" is Individuals. Is this right? (Hiroaki Kondo, National Institute of Advanced Industrial Science and Technology (AIST))	Figure removed
821	48736	2	54	0	0	0	Figure 2.3 doesn't make any sense to me. (Jennifer Hoffman, EcoAdapt)	Figure removed
822	48737	2	54	0	0	0	Figure 2.4: I'm not clear why "decision process" appears on the left, when it seems to me that the column headings represent the decision process. (Jennifer Hoffman, EcoAdapt)	This is right. Will change in next iteration (if figure retained)

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
823	40734	2	54	0	0	0	Figure 2.4: This figure has good information, but I am not sure about the layout of it. Its presentation in columns makes it look like a theory of change or as steps, which it isn't. Suggest revising the layout. Also, the columns make decision-scoping, decision analysis, decision implementation and decision review look like a linear process. FYI, the steps of decision-making look very much like Lasswell's 1951 stages of policy making (problem identification, policy development, policy implementation and policy evaluation) (Lasswell, H. 1951. "The Policy Orientation." In The Policy Sciences, edited by D. Lerner and H. Lasswell. Stanford: Stanford University Press.) The public policy literature, however, has concluded that the stages are useful for analytic consideration, but that the policy process is far from linear. Clearly decision-making related to climate change is also not linear. Bridgman, P and Davis, G. 2003. "What Use is a Policy Cycle? Plenty, If the Aim Is Clear." The Australian Journal of Public Administration. 62(3): 98-102. Figure 4.2. introduces some aspects of non-linearity with circular arrows around two boxes, but those boxes represent only part of the circularity. (Karen Hardee, Futures Group)	Will consider if figure is retained to final draft. Thanks for the refs,
824	39497	2	54	0	0	0	Figure 2-3 is incomprehensible as a framework. Boxes and arrows imply some kind of process/system diagram, but they don't relate consistently to real things. (Sarah Cornell, Stockholm Resilience Centre)	Figure removed
825	53001	2	54	0	0	0	Figure 2-3 is very unclear; I suggest deleting. (Kristie L. Ebi, IPCC WGII TSU)	Figure removed
826	45737	2	54	0	0	0	Figure 2-3 will need further explanation and clarity to improve utility of this future (Roger Street, UK Climate Impacts Programme)	Figure removed
827	53894	2	54	0	0	0	Figure 2-3: It would be useful to have a legend or caption explaining different color schemes, different shapes, and numbers. Also, instead of using footnotes, it would be easier if the abbreviations are spelled out in this figure. Are the lines without arrowheads linking differently than the simple arrows? For example, out of the stress box, what is the difference between an arrow pointing to the WR System and a line connecting those two? (Yuka Estrada, IPCC WGII TSU)	Figure removed
828	42624	2	54	0	0	0	Figure 2-4: How is "Test adaptation options (bottom of second column) different from the process in the 3rd and 4th columns, in which decisions are made and evaluated? Along those same lines, the "evaluate solutions" aspect of the first loop is difficult to differentiate from the "monitor and evaluate" aspect of the second loop, which happens post-decision-making. (Erin Coughlan, Red Cross / Red Crescent Climate Centre)	Labels changed to avoid confusion
829	54187	2	54	0	0	0	Figure 2-4: Many of the topics in previous sections of the chapter appear in this figure. There may be an opportunity to cross reference these other sections within the figure to link the chapter together more clearly. (Michael Mastrandrea, IPCC WGII TSU)	Have not done this, but there is an opportunity to do so if retained
830	53895	2	54	0	0	0	Figure 2-4: The information presented here could be more suitable for table. (Yuka Estrada, IPCC WGII TSU)	Will consider but prefer this
831	40733	2	54	0	0	0	Figures 2.3: It isn't clear what this figure has to do with the topic of the chapter. (Karen Hardee, Futures Group)	Figure removed
832	38210	2	54	0	0	0	stress here and in the review are not defined. Stress can be considred a psychological term and this does not fit into the model. Stress, psychologically speaking is often defined as a process and not a state. The review talks about climate change as a stressor which fits the process model, in that the stressor is the first part of the experience of stress. But a better discussion about stress (psychological and otherwise) would appear to be warrented. Perhaps this will appear in other chapters. (Janet Swim, The Pennsylvania State Universi)	Figure removed
833	38211	2	54	0	0	0	The decision making process at the bottom of this page is very rational, it does not seem to take into account affect and motivational processes. Nor does it take into account different types of decisions (e.g., individual behaviors versus policies). (Janet Swim, The Pennsylvania State Universi)	Will try to emphasise that these processes incorprate risk perception, aversion and any number of similar individual and group concerns
834	48738	2	55	0	0	0	Figure 2.5: "environmental information" should include social and cultural information as well, no? Overall I really like what this figure is getting at, but I think it needs some clarification. I'd also like to see the "strategic intervals" related back to adaptive management (Jennifer Hoffman, EcoAdapt)	Environmental information is meant all environments not just natural. Can clarify later
835	40735	2	55	0	0	0	Figure 2.5: Good. (Karen Hardee, Futures Group)	Thanks
836	40736	2	55	0	0	0	Figure 2.6: Good, although it isn't explained in the text (Karen Hardee, Futures Group)	will add text on page 26, lines 5-7; also, see comment 837 [SJC, SD?]
837	48739	2	55	0	0	0	Figure 2.6: the bottom-up triangle should be modified to include the environment as well, e.g. natural as well as economic resources, and with environmental health called out as a specific attribute on par with technology or information and skills. Environmental health decidedly contributes to adaptive capacity, exposure, and sensitivity. (Jennifer Hoffman, EcoAdapt)	will consider modifications to this figure, including extending the bottom-up triangle (social vulnerability analysis) into the future, and the research challenge faced by those who attempt this (such as the construction of Shared Socioeconomic Pathways-SSP, which underlay the new emission scenarios known as Representative Concentration Pathways (RCP); this would require additional text at page 26, lines 5-7; this would also mean changing the citation to 'modified from Dessai...' [SJC, SD?]
838	41155	2	55	0	0	0	Figure 2-5 Pg55 - is confusing and will need further explanation in the caption or simplification in the graphic (Susan Evans, WWF-Canada)	Ok
839	53896	2	55	0	0	0	Figure 2-5: This figure is hard to interpret and it is not clear what the main thesis is. It needs further explanation and clarification graphically and in words for each component and how each component interacts with each other. For instance, how is the time element depicted in this figure? What are the lines illustrating exactly? It may be more effective to communicate information if the top part is separated from the bottom as I do not see a huge advantage of having them in a single figure. (Yuka Estrada, IPCC WGII TSU)	We will see how the updated text manages in review but have similar concerns
840	54189	2	55	0	0	0	Figure 2-6: Again the figure caption should explain all elements of the figure, so that it can stand alone. (Michael Mastrandrea, IPCC WGII TSU)	agreed [SJC, SD?]

#	ID	Ch	From Page	From Line	To Page	To Line	Comment	Response
841	44169	2	55	0	0	0	Figure 2-6: It is not clear how Figure 2-6 relates to the text as top-down or bottom-up approaches are not discussed in the text. Also why should bottom-up approaches be only for the social side and top-down approaches for the physical side? Further, also top-down approaches can be indicator based and consider a wide range of sectors. The relation to the time axis is not clear: is is meant in such a way, that top-down approaches look farther into the future? (Anne Holsten, Potsdam Institute for Climate Impact Research)	see response to comments 836-837 [SJC, SD?]
842	53897	2	55	0	0	0	Figure 2-6: This figure could be interpreted that bottom-up approach is only present in the past and present time while in the future, only top-down approach exists. It would be useful to have further clarification on how adaptation policy intersects with bottom-up and top-down approaches. Does spatial scale only apply to top-down approach? (Yuka Estrada, IPCC WGII TSU)	see response to comments 836-837 [SJC, SD?]
843	42625	2	56	0	0	0	Consider whether B might be clearer if the axes were positive rather than negative (problem certainty and solution certainty rather than the current version). (Erin Coughlan, Red Cross / Red Crescent Climate Centre)	Figure removed, but may return in final draft. Will consider
844	40737	2	56	0	0	0	Figure 2.7: I understand the point of this, but do not see how the second box relates to the first, and how it relates to decisions. I also don't understand the label "decision risk" and what it means in relation to inform/consult/involve/collaborate. Does decision risk here mean level of uncertainly inherent in the decision? That it is addressing a more "wicked" problem and therefore needs collaboration? More explanation will help. (Karen Hardee, Futures Group)	Published version is somewhat different, but figure removed
845	40738	2	56	0	0	0	Figure 2.8: It is not clear what this figure has to do with decision-making. (Karen Hardee, Futures Group)	it illustrates trade-offs between adaptation (A) and mitigation (M) created by individual actions; will provide additional text on page 35, lines 17-18
846	53898	2	56	0	0	0	Figure 2-8: What are A and M representing? It would be useful to have x- and y-axis labels. Also, the author team may want to consider clarifying that this is a case study or an example illustrating trade-offs and synergies. (Yuka Estrada, IPCC WGII TSU)	the axes are already labelled; will add text to figure caption; also see comment 845
847	41158	2	81	19	81	21	Section Pg 81 line19-21. While this source promotes this paradigm shift in natural resource management (and I would welcome its adoption across sectors), it has not been widely adopted in practice (evidenced by LPR 2012). The way this sentence is written insinuates this shift is happening across all resource sectors full stop. This is not the case and should be clarified. (Susan Evans, WWF-Canada)	Not sure this is for this chapter