#	Ch	From Page	From Line	To Page	To Line	Comment
1	TS	0	0	0	0	The executive summary was written in an attractive and clear words (Saad-Hussein, Amal, National Research Center)
2	TS	0	0	0	0	In reading AR5/WG2/Ch.19, we understand the importance of both adaptation and development pathways that may affect risks of RFCs. In Box TS.10 Figure 1, very informative chart of the relationship between acceptable risks, tolerable risks and adaptation limit is shown. By the same token, Figure 19-6 in Chapter 19 of AR5/WG2 that shows the importance of development pathways that affect vulnerability of society should be added to TS. (Yamaguchi, Mitsutsune, The University of Tokyo)
3	TS	0	0	0	0	The readability of the Technical Summary for a wide range of readers—including both experts and those with limited understanding and knowledge of climate change and of previous Assessment Reports—would be enhanced by increased attention to definitions of acronyms and terms. Continuity and readability may be enhanced by the inclusion of brief, plain English descriptions of key concepts (either 'in situ' associated with first mention in the text, or as a glossary) and references indicating where in the remainder of the AR5 reports the reader might find more information about unfamiliar terms or acronyms. (AUSTRALIA)
4	TS	0	0	0	0	The SPM would benefit from an upfront description of the Representative Concentration Pathways (RCPs) and Shared Socioeconomic Pathways (SSPs). These concepts are crucial to an appreciation of what RCPs and SSPs mean. Of note, policymakers are unlikely to understand the description of RCPs as representing "radiative forcing of 2.6, 4.5, 6.0 and 8.5 W m-2". These concepts are also crucial to the the ways in which scenarios might be used (e.g. one way of dealing with uncertainty; offering a tool for thinking about the range of possible futures or for evaluating desirable futures; thinking about trade-offs; developing adaptation policies and their likely benefits), and the implications of uncertainty around future human development pathways for reporting of impacts and vulnerability in the AR5. (AUSTRALIA)
5	TS	0	0	0	0	Notwithstanding the shift to RCPs/SSP, the SRES scenarios of AR4 should also be described in the Summary for Policymakers given these are used frequently throughout the AR5 reports. (AUSTRALIA)
6	TS	0	0	0	0	The TS would benefit from a brief, plain English description of the climate modelling reported on by WGI, including commentary on advances since AR4 (changes in number and choices of Global Climate Models used, the new RCPs/SSPs; how useful the modelling is at the regional level and implications for downscaling; and so on. That is, reference to 'ensembles of GCMs' is vague and not meaningful). (AUSTRALIA)
7	TS	0	0	0	0	Human health perspectives on climate change also include the movement of vectorborne diseases (such as malaria), to areas where they were previously found. For example in propagating the vector for malaria is moving to higher elevation's, based on consistent warming trends (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
8	TS	0	0	0	0	There should be more evidence-based examples from the Pacific island regions in these "diversity of adaptation experiences" (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
9	TS	0	0	0	0	A significant step out in AR5 is inclusion of Chapter 2 on decision-making and the extension of Chapters 14-17 on adaptation. This has already introduced some very valuable new material and insights. However the linkages and complementarities of these chapters are not always clear in the Chapters themselves (they vary significantly in that repsect eg Chapters 2 and 16 do have a decent go at indicating connections). The Technical Summary is an ideal vehicle to quite consciously draw out the linkages in summary form. (Webb, Bob, Australian National University)
10	TS	0	0	0	0	When regional examples are included, they should try to cover all continents or at least provide justification for a particular selection. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
11	TS	0	0	0	0	Information on projected impacts is not presented very systematically. Projected impacts are not sufficiently linked to the scenarios and the statements presented about projected impacts are often too generic and lacking clear links to scenarios. Information on scenarios and time horizons is only referred to eventually or incidentally. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
12	TS	0	0	0	0	Projections of future impacts, vulnerabilities and adaptation options should be linked to scenarios and they are seldom mentioned in the TS. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
13	TS	0	0	0	0	The definitions for the key terms of the report follow a completely different concept compared to the AR4 (but also the earlier reports) where vulnerability is a function of exposure (in the sense of the climate signal and not in the sense of physical presence of objects at risk as it is the case here!), sensitivity and adaptive capacity. It should be explained why the definitions have changed and what implication this have for the whole understanding of the concept of 'vulnerability to climate change' which has now rather become a 'risk to be affected by climate change'. This change in 'vulnerability paradigm' may be useful but also may lead to some new problems for example when all climate change impacts are named 'hazards' even when they are slow developing creeping issues. At the same time in some parts of the report the 'old' components of the vulnerability such as 'capacity to adapt' appear again but are not anymore further explained. (Schneiderbauer, Stefan, EURAC (European Academy))
14	TS	0	0	0	0	The regional examples given for each section/sector/subject add value to the report, as it makes things more tangible. However, I was wondering whether there is some sort of logic behind the selection of these regional examples? The most important examples available per subject? Is there a balance of global regions over the TS? Could the logic behind the selection be explicitly mentioned to avoid misunderstanding in terms of regional bias? (Huggel, Christian, University of Zurich)
15	TS	0	0	0	0	Replace in the whole TS "race" by "skin color". Ratio: it is scientifically proved that whole humankind belongs to the same race. (GERMANY)
16	TS	0	0	0	0	Structure of document: Generally, in order to provide guidance on the position in the text, it would be extremely helpful to add the letters (A, B, C, D etc.) to each header of sections and subsections. In addition, it would be useful to avoid very long and complicated sentences and to limit core statements up to a maximum of two lines. (GERMANY)
17	TS	0	0	0	0	Displaying "risk" in figures and tables: It would be very useful to always use the same color code for risk, e.g. yellow to red as in the reasons for concern across the report, e.g. in Table TS.5 and Table TS.7. (GERMANY)
18	TS	0	0	0	0	The term "emergent risks" is used throughout the TS, in particular in section C.ii, but no clear definition is provided. Please add information on the time frame and conditions (temperature increase?) you are referring to. (GERMANY)
19	TS	0	0	0	0	The increase in climate change adaption research is mentioned in the introductory section. I believe that there should be some mention of the recent impact research, not just on a regional scale but on a cummunity scale. We have new capabilities with increases in computational power and modelling software accuracy that can improve our understanding of physical impacts to specific areas over the poorly understood time scales of 100years (ie SLR on specific coastal areas and changes in rainfall on rivers). (Miloshis, Michael, Charles Darwin University)
20	TS	0	0	0	0	this chapter is so good that it should converted into a manual on CC. (Nogueira da Silva, Milton, Climate Change Forum of Minas Gerais, Brazil)
21	TS	0	0	0	0	the terms "very likely", "about as likely as not" "exceptionally unlikely" etc may be rigorous in science writing, but are confusing and difficult to grasp. They may even be misleading to journalists, politicians, scholars in humanities, pundits, and the general public, while meaning different things to laypeople. Deniers will easily distort the meaning. Terms should be replaced by writing style. Please see my comment on language tone, above. (Nogueira da Silva, Milton, Climate Change Forum of Minas Gerais, Brazil)

#	Ch	From Page	From Line	To Page	To Line	Comment
22	TS	0	0	0	0	In reading AR5/WG2/Ch.19, we understand the importance of both adaptation and development pathways that may affect risks of RFCs. In Box TS.10 Figure 1, very informative chart of the relationship between acceptable risks, tolerable risks and adaptation limit is shown. By the same token, Figure 19-6 in Chapter 19 of AR5/WG2 that shows the importance of development pathways that affect vulnerability of society should be added to TS. (JAPAN)
23	TS	0	0	0	0	The Technical Summary includes little reference to Asia in comparison with other regions (Australasia, North America and Europe in particular). Asia covers a vast and diverse area and therefore multiple examples from different subregions should be provided as special regional examples. (JAPAN)
24	TS	0	0	0	0	“Summary for Policymakers” as well as Technical Summary paid practically no attention to geoengineering options though such options are discussed in many chapters of WGII SOD. However, nowadays it becomes more and more clear that only geoengineering approach can efficiently stave off potential climatic crisis in the second half of the 21-st century. It should be also kept in mind that climate engineering does not replace any mitigation measures. Such approaches have their own significance and can be applied in parallel with geoengineering. (RUSSIAN FEDERATION)
25	TS	0	0	0	0	New Zealand results are frequently omitted from Australasia summaries, even where they are reported alongside results for Australia in the Chapter\n\n (NETHERLANDS)
26	TS	0	0	0	0	In the TS and SPM of this report, the concept of Exposure is exactly the same as in the Summary for Policy Makers of the SREX (2012). However, its accuracy should be enhanced by adding at the end (after "in places that could be adversely affected"): by a hazard in this case related with climate variability or climate change. (COLOMBIA)
27	TS	0	0	0	0	In the TS and SPM of this report, the concept of Vulnerability to climate chang is he same as in the Summary for Policy Makers of the SREX (2012). However, it is different from the one published in the Fourth Assessment Report (2007), which may cause confusion among people working in this topic. In the Fourth Assessment Report the concept was "The degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, the sensitivity and adaptive capacity of that system", and here the concept was summarized as "The propensity or predisposition to be adversely affected". Based on the concept published in the Fourth Assessment Report most of the current studies related to vulnerability analysis have been done based on the issue that we should consider: Exposure Sensitivity and Adaptive Capacity (some examples of studies applying this conceptual framework are listed below). In this sense, the Fifth Assessment Report should make clear if the concept of Vulnerability changed or if it's still being considered as a function of the Exposure, Sensitivity and Adaptive Capacity of the system. In the Chapter 14 this clarification is done, but this is not reflected in the TS and SPM.\n• Klausmeyer K.R., M.R Shaw , J.B MacKenzie, and D.R Cameron 2011, ´Landscape-scale indicators of biodiversity's vulnerability to climate change´, Ecosphere, 2 (8), p. 1-18, viewed 18 Mayo 2013, http://www.esajournals.org/doi/full/10.1890/ES11-00044.1\n• Glick P., B.A Stein, and N.A Edelson, 2011, Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment, National Wildlife Federation, Washington, D.C, viewed 18 Mayo 2013, http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2011/Scanning-the-Horizon.aspx\n• Institute of Hydrology Meteorology and Environmental Studies of Colombia - IDEAM, 2010, ´Chapter 4 Vulnerability´, Second National Communication of Colombia to the United Nations Framework Convention on Climate Change, Bogota, Colombia, viewed 18 May 2013, https://documentacion.ideam.gov.co/openbiblio/bvirtual/021658/021658.htm\n• Global Adaptation Index - GaIn: http://gain.globalai.org/\n• EEA 2008, ´Chapter 6 Adaptation to climate change´, Impacts of Europe's changing climate - 2008 indicator-based assessment, EEA Report No 4/2008, Copenhagen: http://www.eea.europa.eu/publications/eea_report_2008_4 (COLOMBIA)

#	Ch	From Page	From Line	To Page	To Line	Comment
28	TS	0	0	0	0	The Figure "Schematic of the interaction among the physical climate system, exposure, and vulnerability producing risk" (Figure TS.2. and SPM.1), is very clear and useful to understand Risk. However, in the figure it should be visible how Vulnerability is being considered (as a function of Exposure, Sensitivity and Adaptive Capacity? or just the suceptibility to suffer loss or damage?). As an evolution of the Figure presented in the SREX (2012) it is here clear that you are considering Exposure with Vulnerability (within the same circle), which makes sense. However, the figure could be clearer (the Exposure is an internal condition of the Vulnerability? no Exposure means no Vulnerabiliry? what about Sensitivity and Adaptive Capacity?). The Figure seams conceptually congruent with risk definition, but not with vulnerability definition (which is clarified in the Chapter 14, but not in this figure). (COLOMBIA)
29	TS	0	0	0	0	In the TS and SPM of this report, the definition of "emergent risk" is not as clear as the concept of "key risk". Even though there are some examples of "emergent risks" in this part of the report, the definition should be clearly presented before these examples. Also, because the Figure TS.2 shows the concept "emergent risk" and indicates that the definition will be foun in Section C.ii. (COLOMBIA)
30	TS	0	0	0	0	This is a suggestion for the "Table TS.8. and SPM.5": this Table shows a column with the title "Key vulnerabilities", however the content of some rows does not reflect what is the key vulnerability of the item analyzed. This is the case of: “Vulnerability of aquatic systems and vulnerability of aquatic services…” or “Increasing vulnerability of small landholders in agriculture”. This column should be revised in order to make clear what is making each item more or less vulnerable (its exposure or sensitivity or adaptive capacity or all of them, instead of its vulnerability which is too general). In the page 69, question 5, of the Frequently Asked Questions, there is a list of considerations of a "key vulnerability" which should be consistent with what is showed in this Table as an example. (COLOMBIA)
31	TS	0	0	0	0	If these are summaries for technicals (TS) and policy and decision makers (SPM), it is desirable to include a brief summary of Adaptation Assessments, which is presented in the Chapter 14. Decision makers do not have clarity about how to design, prioritize, and evaluate adaptation measures. Also, this is useful for technicians and scientists. (COLOMBIA)
32	TS	0	0	0	0	Comment to the whole document - The TS gives the impression that the sky is falling. Suggest the inclusion of examples of changes that have been documented. (UNITED STATES OF AMERICA)
33	TS	0	0	0	0	Comment to the whole document - There are several references to results from AR4 (specifically noted). This chapter would be well served to update with new AR5 information (UNITED STATES OF AMERICA)
34	TS	0	0	0	0	Detection and attribution need to be defined; and any deviation from the WG1 invocation of these terms needs to be explained. Most importantly, the agree-upon definition needs to be used consistently. (UNITED STATES OF AMERICA)
35	TS	0	0	0	0	The authors need to have a careful scrub of the chapter to remove mentions of "will" when in fact the statements are based on projections of some future outcomes. More appropriate would be language like "may" or "projections show", etc. These statements cannot be presented as fact. (e.g., p. 35, L33) (UNITED STATES OF AMERICA)
36	TS	0	0	0	0	The authors should take care in attributing degraded ecosystems to climate change when in fact, many ecosystem shifts have been triggered by non-climate related human activities. Climate is likely a necessary component of change to these changes, but not necessary and sufficient. (UNITED STATES OF AMERICA)
37	TS	0	0	0	0	The issue of jargon is problematic. From a non-social science perspective, what are the "actors, states and institutions" that are discussed? There is likely to be the same issue from a social science perspective, there is jargon on the physical or natural sciences side that should also be addressed. (UNITED STATES OF AMERICA)
38	TS	0	0	0	0	The regional plots/tables are well coordinated. The reader would benefit from an illustratin of geater coherence among regions, so it is easy to compare information between world regions. There are many good ideas here about how to present the information but they are inconsistent in their presentation. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
39	TS	0	0	0	0	The text that discusses biodiversity is heavily slanted towards the bias that low biodiversity is bad. In fact, many systems prior to European settlement in North America, for example, were monocultures and, with poor management have crossed systematic thresholds into what are now highly diverse systems with regards to biota. These are unnatural systems that are undesireable from a management system, but in fact, have significantly accelerated nitrogen cycling (think woody plant encroachment - again, not an invasive problem). (UNITED STATES OF AMERICA)
40	TS	0	0	0	0	There are several sections that discuss ecosystem services and problems with invasives. How invasives are defined is unclear. Are these instances of alien invasive species (e.g., as in Bromus tectorum in the Palouse prairie of the US, or rabbits in Australia), or do these statements actually reflect the consequences of human activities, often in tandem with climate change that facilitate encroachment of existing species? Please clarify. (UNITED STATES OF AMERICA)
41	TS	0	0	0	0	This document is rather long with much repetition, especially between introductory text, followed by regional examples within a section. In many instances, the regional text provides greater insight than the introductory text. There are a few sections (Food Production, Key Economic Sectors, etc) that are disproportionally short. Suggest standardizing so there is more consistency in length and level of detail. Filtering out redundant text will make this task easier. (UNITED STATES OF AMERICA)
42	TS	0	0	0	0	While the TS provides information on how likelihood, risk and confidence statements are communicated, it is not clear to what extent a statement is based on expert judgement as opposed to literature findings. One can only assume that if there is no cited reference, then an assessment is based on 100% expert judgement which is problematic for a scientific assessment. (UNITED STATES OF AMERICA)
43	TS	0	0	0	0	CO2 Effect in the map titles is confusing: expand to e.g. "Direct Effect of CO2 on Crops" or "CO2 Fertilization" (with brief explanation in the caption). (Ingram, William, Met Office)
44	TS	0	0	0	0	There is a huge amount of repetition between the SPM and the TS. Whilst the SPM is likely to change considerably, we would like the authors to really think about the different audiences for the two summaries. A greater depth of information should be drawn out in the TS and the SPM should focus on pulling together these messages for the policymaker. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
45	TS	0	0	0	0	A bit obsessed with the idea that warming is happening (which it is not) and that it is caused by carbon dioxide (for which there is no evidence), too dependent on the biased views of your employees and too frantic. Some useful advice but too much emphasis on disasters (Gray, Vincent, Climate Consultant)
46	TS	1	1	1	1	Remove 2014 since it implies that the impacts, adaptation and vulnerabilty being the subject of the document refer to climate change of the year 2014 only (KENYA)
47	TS	1	31	1	31	Please rewrite this heading in accordance with SPM page 1, line 32: "Impacts, vulnerabilities,…". (NORWAY)
48	TS	2	0	4	0	The introduction is very useful in explaining the concepts, definitions of critical terms and uncertainty language, this increases the readability of the whole TS and is highly appreciated. (GERMANY)
49	TS	2	10	2	10	Box SPM.1 referred to here is far towards the end of the last pages of the document. This location is really inconvenient for a reader to keep on turning pages of a document to refer the the box. It is noted that virtually all tables, figures and boxes are not within the same subject which they refer to and the reader has to keep seraching where they are located which is very inconvenient indeed. Further, all these labeledSPM..., another confusion again since this is a Tecnical Summary ! hence for clarity, lableing of figures, boxes, tables should be TS (KENYA)
50	TS	2	29	2	30	It states 'literature has more than doubled'. Strictly seen the figure 1.1-a in Chapter 1 shows a near doubling for the climate change literature when comparing 2005 and 2010. Extrapolating this trend towards the current year 2013, We indeed expect that the claim that 'literature has more than doubled' is supported. Please spend some attention to this in the body text of chapter 1, to substantiate the claim.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
51	TS	2	29	2	44	While qualitatively reflecting the truth, the Box TS.1 Figure 1 is may be quantitatively misleading as support for the assertion in the text. Researchers in developing countries (think South America and francophone Africa, probably China) often do not publish in English. (Stone, Dáithí, University of Cape Town)
52	TS	2	30	2	30	There needs to be an author with this "very high confidence" (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
53	TS	2	32	2	33	Most of research on climate change have been done by individual/s or groups from independent research centre or academic institutes where the Governments of developing countries have minimum involvement on these research. (Younus, Md, Lecturer, School of the Environment, Flinders University, Research Fellow, Adelaide University, South Australia)
54	TS	2	41	2	44	Figure 1-1 does not depict 1-1 b, although text refers to this. Please add 1-1 b to the map in Figure 1-1\n\n (NETHERLANDS)
55	TS	2	51	2	51	Adapatation limits, processes and transformation in ..... (Younus, Md, Lecturer, School of the Environment, Flinders University, Research Fellow, Adelaide University, South Australia)
56	TS	3	3	3	3	“among planning for adaptation….”. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
57	TS	3	21	3	22	In the second bullet, please mention the term "likelihood". (GERMANY)
58	TS	3	22	0	0	Box TS.2. has a definition on Exposure. I think this is the combination of Exposure and Sensitivity in the older 3-component-approach such as V = f(E, S, AC). It is better to explain it somewhere in the box. (Schipper, Lisa, Stockholm Environment Institute)
59	TS	3	22	3	56	Under glossary terms critical: needs to be references in each of these (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
60	TS	3	22	4	7	The changes to the definitions are not properly justified. Are they easy to understand or clear for policy makers? Are these definitions clear enougth or better than the previous, accepted definitions? And some of them (e.g. exposure, vulnerability) seem quite incompletely (adversely affected by what?). The definition of adaptation, with different definitions for human and natural systems, is quite confusing. Incremental adaptation: "Incumbent systems" is unclear and climate change is not mentioned. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
61	TS	3	29	3	29	Delete 'the' before 'solar cycles'\n\n (NETHERLANDS)
62	TS	3	34	3	34	Do you need to say which definition has been adopted here? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
63	TS	3	36	3	37	This definition of exposure taken from the disaster risk community is not always applicable in the climate change context where the zones affected are often not clearly dedicated and delinated as for example in the case of a flood (Schneiderbauer, Stefan, EURAC (European Academy))
64	TS	3	36	3	45	How do exposure, vulnerability and impact relate to risk? please add this information. (GERMANY)
65	TS	3	41	3	41	Would it be useful to allow the distinction between impacts and responses here? Natural ecosystems and society respond to climate change which is different from being impacted by climate change. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
66	TS	3	48	3	48	Delete 'which'\n\n (NETHERLANDS)
67	TS	3	52	3	56	These secondary adaptation definitions do not add value and, in fact, will likely confuse the reader. (UNITED STATES OF AMERICA)
68	TS	3	53	3	54	Please do never ever use additional terms to quantify likelihood, that leads to confusion and weakens the whole concept of using agreed uncertainty language across the AR5. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
69	TS	4	2	4	3	Is "hazardous event" the best term to use to refer to the varied impacts of climate change? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
70	TS	4	4	2	3	Suggest deleting "anticipate, reduce, accommodate" as not germane to resilience, which is solely the ability to recover quickly from a perturbation. Anticipation and reduction are not ecological properties, also. (UNITED STATES OF AMERICA)
71	TS	4	8	4	8	Why not provide a definition for "mitigation" as it is referred to in the text (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
72	TS	4	13	4	55	All these assessments are by people who have a conflict of interest, since they are paid to make them . Alternative unbiased opinioins such as mine are unwelcome and ignored. (Gray, Vincent, Climate Consultant)
73	TS	4	24	4	24	“an evaluation by the team of authors….” Better? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
74	TS	4	36	4	36	Remove double end parentheses after "Figure 1.4" (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
75	TS	5	0	18	0	Section A.i.: It is difficult to follow the structure of this section. The back and forth between observed impacts on the one hand, and vulnerabilities and risk on the other is confusing. The subsections on sectors and regions in section A.i would greatly profit, if language and structure could be revised in a way that enable easy differentiation between observed impacts, present vulnerabilities, and emerging/future risks: \n1) remove duplications, \n2) statements human/social/economic and biophysical/natural systems, \n3) statements on the past, present and future situation,\n4) information on detection and attribution, \n5) statements on climate change phenomena from its impacts, \n6) identify vulnerability and risks, \n\n7) The difference between the specific regional examples given for each sector and the examples given in Table TS.1 is not obvious. (For example, list on P 13, L 6: why is the example on Europe mentioned in this list, and not in Table TS.1? What are the criteria for choosing these "specific regional examples"? Is the choice related to a difference between an observed climate change impact, and a detected and attributed impact? If yes, this should be spelled out more clearly. Clarity and comprehensibility would be improved by including all examples into table TS.2. \n\n8) Uncertainty needs to added to each key statement. (GERMANY)
76	TS	5	1	5	1	Please adjust the wording of heading A) to the more logical heading A) in the SPM. (GERMANY)
77	TS	5	1	21	26	The section on 'Vulnerabilities, Impacts, ...' is very elaborate on what can be attributed to climate change and what cannot be attributed or has been rated as low confidence but it would be good if at the beginning of the section, the role of the other factors apart from climate change are defined e.g population and the interrelations especially as it relates to adaptation and vulnerabilty and briefly on how it was decided what is attributable to climate change and what is not before going into the details. A good example is marine systems where some studies have shown that it is not climate change or population (leading to over-fishing) but actualy water quality that is leading to a decline in fish populations in some water bodies and since the waste is from municipal waste - the authorities report that it is actually climate change. How do we ensure that these factors are well addressed in the report and the attribution to climate change is well researched and proven?\n\n (NETHERLANDS)
78	TS	5	5	54	54	This statement should have a level of confidence assigned to it. (UNITED STATES OF AMERICA)
79	TS	5	6	0	0	Consider adding (phenology) after 'activities' (Donnelly, Alison, Trinity College Dublin)
80	TS	5	12	0	0	Consider adding (phenology) after 'activities' (Donnelly, Alison, Trinity College Dublin)
81	TS	5	12	5	12	Please adjust the wording of heading A.i. to the heading A.i. in the SPM. (GERMANY)
82	TS	5	12	5	38	Africa and Asia are not included here and are particularly vulnerable to certain events. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
83	TS	5	16	5	17	The absence of warming for the past 15 years and the persistent cold winters in the Northern Hemisphere are largely ignored (Gray, Vincent, Climate Consultant)
84	TS	5	19	5	19	Stronger evidence based on what ? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
85	TS	5	24	5	25	The example of Europe needs further development. As it stands it is rather poor. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
86	TS	5	25	5	25	Does Table TS.1 make any attempt to distribute what component of change in water quality, rain/snow, temperature versus snowpack, etc. are responsible for ecosystem response? (UNITED STATES OF AMERICA)
87	TS	5	25	5	28	Table TS. 1, in the 'Europe' section on 'Coastal and Marine' the information on cod and eelpout seems very specific, given the high-level nature of the document. The shift in cod distribution (given a high confidence score) is actually quite controversial, and there is much argument about whether the shift is due to climate or depletion by the fishery. There is huge literature base on European fish distribution shifts, so the inclusion of these specific studies seems very narrow. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
88	TS	5	35	5	35	“attributional” adjective rather than noun? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
89	TS	5	37	5	38	Research needed for the risk and impacts of extreme events? (UNITED STATES OF AMERICA)
90	TS	5	41	7	17	This section places a lot of emphasis on vulnerability drivers relating to social and socioeconomic factors. While these factors are very important to define differential vulnerability within particular communities and socioeconomic systems, the section lacks reference to the primary causes of vulnerability, i.e. those affecting everybody, such as the presence of people and assets in vulnerable or exposed areas, the biophysical and climate drivers in different geographies, etc. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
91	TS	5	41	7	56	The evidence, confidence and agreement of statementsn in this section should be included. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
92	TS	5	43	0	0	What does "systemic" signify here? (The statement on p 3, l 28 of the SPM does not contain this word.) And are these systemic drivers also non-biophysical? (GERMANY)
93	TS	5	43	5	51	Still no mention of sensitivity to climate change. This may go beyond 'multi-dimensional' vulnerability - which focuses here on power and equality - and environmental degradation, rather than the environment even without degradation. Perhaps there is a wish to avoid any hint of environmental determinism here, but at the expense of saying that the cards you are dealt with can be a major factor in a priori sensitivity to climate change? (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
94	TS	5	44	5	44	After "impacts" add "on people and communities". Rationale: it should be said clearly in the first sentence of the para what or who is at risk. (GERMANY)
95	TS	5	44	5	45	AR4 the framing of adaptation is moved further from the focus on biophysical" (need source here and page number) (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
96	TS	5	47	5	47	See also comment referring to SPM: To use the term "gender" in this context is confusing and contraproductive. The term "gender" refers to the physical, mental, and behavioral characteristics distinguishing between masculinity and femininity, hence is socially constructed. The term "sex" distinguishes between men and women biologically. People are discriminated / more vulnerable because of their sex not because of their gender. Therefore, in this paragraph the term "sex" should be used, not the term "gender". (GERMANY)
97	TS	5	48	5	48	“Uneven pathways of socio-economic development…” (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
98	TS	5	49	5	50	I suggest to include power imbalance. (Huggel, Christian, University of Zurich)

#	Ch	From Page	From Line	To Page	To Line	Comment
99	TS	5	53	5	53	Notice that in chapter 19 the paragraph 19.6.1.3 starts with "Vulnerability and exposure of societies and social-ecological systems...". In the TS and SPM this changes to "Vulnerability and exposure of communities or social-ecological systems...". There are differences between societies and communities. The term society is more general, and it also refers to a social kind of organization, like human ones, but not all communities are social. In a biological context, community can refer to a community of animals or plants. In this case it is clear from the content of the paragraph that the the subject is human, so in the summaries the term "communities" should probably be changed to "societies". \n\n (NETHERLANDS)
100	TS	5	53	6	2	The level of confidence is missing in this para. (GERMANY)
101	TS	5	54	5	54	Effective "disaster" risk reduction. Should have the word "disaster" here . (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
102	TS	5	54	5	54	“adaptational” (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
103	TS	5	56	6	1	What is the meaning of this statement? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
104	TS	6	6	6	6	It is arguable whether wealth affects level of vulnerability, as opposed to level of resilience. The examples given in the subsequent finding are all from wealthy countries. All nations with coastal zones are vulnerable to sea level rise independent of wealth. Suggesting reconsidering the assignment of "very high confidence" here unless the statement addresses resilience instead of vulnerability. (UNITED STATES OF AMERICA)
105	TS	6	6	6	8	What about health as a factor that influences vulnerability? (UNITED STATES OF AMERICA)
106	TS	6	6	6	11	This paragraph is difficult to read. Suggest simplifying or rephrasing. The last sentence is particularly confusing and could be split in two. \n\n (NETHERLANDS)
107	TS	6	6	6	11	Although this paragraph generally fits the discussion in the Chapter referred to, none of the Chapter sections specifically discuss the dependency of future vulnerability to the factors such as wealth and its distribution across society, patterns of aging, access to technology and information, labor force participation, societal values, and mechanisms and institutions to resolve conflicts. \n\n (NETHERLANDS)
108	TS	6	6	17	23	These details are not mentioned in Table TS.2 but seem like they would be better placed there than in the text; similar details are not given in the other bullets (UNITED STATES OF AMERICA)
109	TS	6	12	0	0	The expression "some ecosystems and many human systems" is very vague, so that although "very high confidence" is attributed to it, it is not very useful. Could you be more specific? (GERMANY)
110	TS	6	12	6	12	Suggest that the authors re-word this sentence so that 'current climate variability' is up front. (UNITED STATES OF AMERICA)
111	TS	6	12	6	26	This section is about vulnerability “to current climate variability”, while Table TS.2 is about risk to extreme events under climate change. The meteorological/climate columns of Table TS.2 therefore do not bear any relevance. The “impacts” columns in Table TS.2 also appear parallel to the bullet points in the text and so these could be merged (into table or text). Also, note that one of the main ideas with Table 18-4 (and thus Table TS.2) is to convey the concept of risk in relation to extreme events. When discussing vulnerability, as here, we may have *very high confidence* that the hurricane *caused* the property damage, but if we are discussing risk then we may have to say instead that the hurricane was *a major contributing factor* (along with building codes for instance), possibly with lower confidence. Thus the confidence assessments in Table TS.2 may not directly relate to the discussion of vulnerability here. (Stone, Dáithí, University of Cape Town)

#	Ch	From Page	From Line	To Page	To Line	Comment
112	TS	6	12	6	37	While cases of Australia, New Zealand and North America are mainly described, those of other regions including Asia are not included. In Korea, 67 people lost their lives due to floods in Seoul and Gyeonggi area in 2011 and heat waves in 2012 resulted in a large number of heat-related patients. (Source: J of Preventive Medicine and public health 2013;46:19-27) (REPUBLIC OF KOREA)
113	TS	6	12	6	37	There are no examples of Asian impacts from recent extreme climatic events. A suggested addition is: "Asia experienced the highest number of weather- and climate-related disasters in the world during the period 2000-2008 and suffered huge economic losses, accounting for the second highest proportion (27.5%) of the total global economic loss. (Chapter 24 page 29 lines 42-44)" (JAPAN)
114	TS	6	12	6	45	This paragraph should be moved to the beginning of this section (P5 L 42) because it is closely related to the prior paragraph (P5 L 14-38). If it is left at its current position, it interrupts the reading flow on vulnerability. (GERMANY)
115	TS	6	13	6	15	Put "human" instead of "ecosystem" first. (GERMANY)
116	TS	6	15	6	16	The statement "developed and developing countries ...for some sectors and within some regions" is at the same time ubiquitous and vague. Please clarify what is meant here. (GERMANY)
117	TS	6	15	6	16	The statement, "These experiences are consistent with a significant adaptation deficit.." followed by "See Table TS.2" suggests that Table TS.2 should mention something about adaptation deficit, however it does not. "See Table TS.2" would be better places after the previous sentence that end with "...consequences for mental health and human well-being." because infrastructure, mortality, etc. are mentioned in table TS.2\n\n (NETHERLANDS)
118	TS	6	16	6	46	Line 16 mentions and the subsequent bullet point indicate a "significant adaptation deficit" (please add uncertainty of this statement), but this is not reflected in Table TS.2 (GERMANY)
119	TS	6	17	6	22	“caused”, “destroyed”, “resulted in”: In WGII it is not enough to say that some weather event “caused” some damage without some assessment of the confidence of the assertion. (Stone, Dáithí, University of Cape Town)
120	TS	6	17	6	23	It is accurate but a large understatement to say that drought resulted in mental health problems, when in Chapter 25 it is stated that many suicides occurred.\n\n (NETHERLANDS)
121	TS	6	24	6	25	Which extreme events in Europe? 2003 heatwave? 2002 floods? Effects of heatwaves have diminished since 2003. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
122	TS	6	26	6	25	How this economic sectors in North America respond to extreme weather events? In terms of adaptation? (Huggel, Christian, University of Zurich)
123	TS	6	26	6	26	What economic sectors are affected? This goes to general statement above on the use of the term 'sector'. (UNITED STATES OF AMERICA)
124	TS	6	26	6	35	If feasible it would be interesting to provide some numbers for this example, e.g. for no. Of vulnerable elements, damage (e.g. in USD). (Huggel, Christian, University of Zurich)
125	TS	6	30	6	30	I suggest to replace the term (strom) 'pathway' with storm track or trajectory, because previously in the report pathway was used for socio-economic pathways (to avoid confusion). (Huggel, Christian, University of Zurich)
126	TS	6	34	0	0	For instance hurricane Katrina with winds up to 224km/h, Mississippi bank burst, New Orleans was flooded and oil rigs severly damaged. It lead to 165 USD bn economic losses whereof 76 USD bn were insured. \nhttp://media.swissre.com/documents/sigma2_2006_en.pdf#page=21 (Mueller, Lea, Swiss Reinsurance Company Ltd)
127	TS	6	36	6	36	What does timeliness mean in this context? (Huggel, Christian, University of Zurich)
128	TS	6	36	6	37	This statement is REALLY important. Please clarify, detection and attribution of what? (UNITED STATES OF AMERICA)
129	TS	6	38	6	38	Needs to be an additional bullet point in here regarding the Pacific island countries with respect to recent floods and severe damage of infrastructure and settlements in this past year (2011-2012) (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)

#	Ch	From Page	From Line	To Page	To Line	Comment
130	TS	6	47	8	2	Box TS.4: It is not obvious why these paras are in a box. In which way are they different from other paras? In addition, the text in this box is not easily accessible. It is recommended to use simpler language, and avoid redundancies, also between text and figure. Please order the content of the list of bullet points, there are some repetitions. E.g., all statements on gender differences could be summarized in one bullet. The statement on pastoralists and artisanal fisher folk is a bit surprising as it seems to be much more specific than the others. In addition, the examples in the list are mostly risks and vulnerabilities, often relating to the impacts of extreme weather - they do not describe observed impacts of climate change. This should be made clear in the subheading. A common and clear structure, also with regard to past vs. future vulnerabilities would be helpful. The focus of the box on human systems should be spelled out in the title. Most of this information is repeated later in the human systems and sectors discussion on p14-18. Please consider to remove redundant part of the list, and text. (GERMANY)
131	TS	6	51	6	51	People who are socially, economically, culturally, politically and institutionally marginalized, (forgot "," after marginalized (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
132	TS	6	54	7	4	The term "gender" should be replaced by the term "sex" (see also comment on TS P5 line 47) (GERMANY)
133	TS	6	54	7	8	Are all these factors described in the literature? What does "voice" mean? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
134	TS	7	1	0	0	What does "voice" mean? (GERMANY)
135	TS	7	1	7	8	Needs to be consideration here with respect to the overlap with poverty alleviation. Another was this dimension needs to include a section on poverty and how this overlaps with multidimensional inequality. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
136	TS	7	4	7	5	It is not clear what is meant by the example in the brackets. The example is rather misleading, hence creating confusion. Either erase the example or explain in more detail. (GERMANY)
137	TS	7	5	7	8	The phrase: "Few studies…and thus attribution remains a challenge" contradicts the rest of the section. The final statement is not clear either. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
138	TS	7	6	7	7	The statement that inequality is not just a consequence of climate change could be misleading or misunderstood. Climate change is typically only a small driver of inequalities. (Huggel, Christian, University of Zurich)
139	TS	7	7	7	7	Here is a mention of sensitivity but pre-fixed by inequality. There is a risk that this becomes the only lens through which it is seen. Perhaps that is the intention, and justifiably, but the report mentions and accepts that there are so many other important factors at play so the justification for this single-focus could be more explicit. (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
140	TS	7	19	7	56	This is a laundry list. Suggest provide a few compelling examples to illustrate the point. (UNITED STATES OF AMERICA)
141	TS	7	19	7	56	You are only interested in disasters. Are none of us ever better off? (Gray, Vincent, Climate Consultant)
142	TS	7	23	7	26	Whether it is the language or what the author intended to convey, the message from this sentence is that people are dying from gender roles. We think it is supposed to argue that gender roles inform the type of work/occupation taken up by an individual hence their exposure to heat stress.\n\n (NETHERLANDS)
143	TS	7	25	7	25	Replace "due to gender roles and responsibilities" by "due to their roles and responsibilities" (GERMANY)
144	TS	7	27	7	29	Add a brief explanation why this is the case. It is particularly unclear how climate change can lead to an increase in domestic violence. Brief explanation could be taken from CH 13 P12 line 27-34. (GERMANY)
145	TS	7	30	7	31	Move this point up in the list of points because of its relatively general nature. (NORWAY)
146	TS	7	38	7	38	After "diseases." Add "Children are at increased risk for severe mental health reactions following extreme events." (Ronan, Kevin, CQUniversity Australia)

#	Ch	From Page	From Line	To Page	To Line	Comment
147	TS	7	42	7	43	Indigenous peoples may be more resilient to climate effects. For example, changing crop types and where they are grown; grow a wider variety of crops to lower their risk to climatic events. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
148	TS	7	49	7	49	Shouldn't the reference be rather 12.4.1.2. instead of 12.4.2, since in Chapter 12, section 12.4.1.2 at page 13, lines 51 until page 14, line 9 provide supporting evidence for the statement at page 7, lines 47-49 of the TS. \n\n (NETHERLANDS)
149	TS	7	50	7	51	Move this point up in the list of points because of its relatively general nature. (NORWAY)
150	TS	7	51	7	51	Can change reference in Chapter from 12.5 to 12.5.3 to make it more relevant\n\n (NETHERLANDS)
151	TS	7	52	7	52	This sentence appears unclear.It suggests wouman are a marginalised group. Please rephrase. (BELGIUM)
152	TS	7	52	7	53	The context in which this statement relates to climate change should be provided. (IRELAND)
153	TS	7	54	7	56	This is a very strong and contentious statement and should be reconsidered. (IRELAND)
154	TS	7	54	7	56	The statement in its current form erroneously suggests that mitigation actions generally increase vulnerability. We suggest the following modification: "If mitigation measures are not coordinated and/or coherent with other objectives of sustainable development, disadvantaged groups without access to land and labor, including female-headed households can disproportionally be harmed...". Please add at the end of line 56: "Therefore, if their needs are not properly considered in the planning and implementation of mitigation measures, there [also] might be an actual tradeoff between the goals of efficient generation of carbon emissions certificates and the broader generation of the sustainable development dividend." (taken from Ch 20, P10 lines 22-23) (GERMANY)
155	TS	7	56	7	56	Bullet points need to include traditional knowledge dimension with respect to risks of climate change and climate change responses (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
156	TS	8	7	8	9	An article that considers the same trend in glaciers in South America is: A. Rabatel, B. Francou, A. Soruco, J. Gomez, B. Caceres, J. L. Ceballos, R. Basantes, M. Vuille, J.E. Sicart, C. Huggel, M. Scheel, Y. Lejeune, Y. Arnaud, M. Collet, T. Condom, G. Consoli, V. Favier, V. Jomelli, R. Galarraga, P. Ginot, L. Maisincho, J. Mendoza1, M. Menegoz, E. Ramirez, P. Ribstein, W. Suarez, M. Villacis, and P.Wagnon. Current state of glaciers in the tropical Andes: a multi-century perspective on glacier evolution and climate change. The Cryosphere, 7, 81–102, 2013, doi:10.5194/tc-7-81-2013. (COLOMBIA)
157	TS	8	7	8	9	Please explain why and how have these changes occurred - increased snow, precipitation, other? Wind events? (UNITED STATES OF AMERICA)
158	TS	8	8	7	9	Although correct, a more nuanced approach is warranted here. For example, data on growth of glacial icepack in Antarctica should be acknowledged even though the net effect is reductin. This should reflect our level of knowledge regarding the spatial distribution of glacial changes. (UNITED STATES OF AMERICA)
159	TS	8	8	8	8	Replace "seasonal ice in many lakes and rivers" with "lake and river ices". (Duan, Juqi, National Climate Center, Chinese Meteorological Administration)
160	TS	8	8	8	8	Replace "seasonal ice in many lakes and rivers" with "lake and river ices" (PAN, Jiahua, Chinese Academy of Social Sciences)
161	TS	8	8	16	17	As written, it is suggested that the authors consider a level of "Very High Confidence" - we know these changes have occurred. The link to climate change, however, may have "Medium Confidence, hence it may be that the statement should be restated as implicating climate as primary causal agent. (UNITED STATES OF AMERICA)
162	TS	8	12	8	12	Permafrost boundaries (which boundaries with which countries-geographic range) ? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
163	TS	8	14	8	14	It is unclear if this is a medium attribution or medium response to climate change. Please clarify (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
164	TS	8	16	0	0	The section identifies "changing rainfall" but then discusses decreased spring snowpack. Suggest revising to "changing precipitation" (CANADA)
165	TS	8	16	8	19	Here it is sayed "Low to medium confidence: in many rivers flood frequency has been alterated by climatic change". Then, this degree of confidence should be considered in the conclusions about flood frequency. (Llasat, Maria-Carmen, University of Barcelona)
166	TS	8	22	0	0	define low flows better, is there a definition to rely on in chatper 18? (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
167	TS	8	23	8	24	More references could be added, e.g. to 3.2.5 and 3.2.6\n\n (NETHERLANDS)
168	TS	8	26	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
169	TS	8	26	0	44	In the regional examples, to be consistent, chapter sections in square brackets indicating detection and attribution levels of confidence, the sections In Chapter 18 where these are found should be included, except in the those cases where there are none. (Tibig, Lourdes, The Manila Observatory)
170	TS	8	26	8	26	Pacific regional examples including the following should be separated by temperate land versus tropical regions. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
171	TS	8	26	8	50	You are only interested in disasters. Are none of us ever better off? (Gray, Vincent, Climate Consultant)
172	TS	8	27	8	29	Why are exactly these Asian regions picked out for the subject of glacier shrinkage? I think that could be misleading because they are not exactly representative for a global average. Many regions over the world show glacier shrinkage (area) more on the order of 20-40% since 1960, much more than the 10% indicated for these Asian regions. (Huggel, Christian, University of Zurich)
173	TS	8	27	8	29	The example of Altai-Sayan, Pamir, and Tien Shan glaciers should be discussed as a special regional example under Terrestrial and inland water systems (page 9 line 46). A suggested replacement is: "Increased runoff from shrinkage of glaciers has been observed in the Himalaya and Central Asian mountains due to increased temperature (Chapter 24 page 9 line 54 - page 10 line 2)" (JAPAN)
174	TS	8	32	8	32	Not only snowpack but also runoff (attribution) (Huggel, Christian, University of Zurich)
175	TS	8	37	8	37	The cryosphere is not a geophysical variable (just delete 'geophysical variables'). (Huggel, Christian, University of Zurich)
176	TS	8	39	8	39	Based on the rapid glacier retreat in the Andes, I suggest to add '…are retreating fast' (Huggel, Christian, University of Zurich)
177	TS	8	54	8	55	What does it mean to have “high confidence” that something “could” be possible? I could probably also have high confidence that future climate change could not approach that, without contradicting the first sentence. (Stone, Dáithí, University of Cape Town)
178	TS	8	54	9	3	Is this a statement on observed impacts or on projections? If the latter, it should not be placed here. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
179	TS	8	56	8	56	Exchange "even" for "also" to generate "…have responded to climate change in Earth history also when the rates of past global change were slower…". (NORWAY)
180	TS	9	1	9	1	I'm not sure it is a good idea to talk about warming scenarios in a section on observed impacts. Just say: slower than warming observed during the past decades. (Huggel, Christian, University of Zurich)
181	TS	9	4	9	5	It is necessary to clarify that the data presented do not correspond to the entire Amazon, because deforestation in the Amazon in Ecuador has not diminished in the last 10 years. (Galarza, Maria Jose, Ministerio del Ambiente del Ecuador)

#	Ch	From Page	From Line	To Page	To Line	Comment
182	TS	9	5	9	5	A species cannot move its range. A range of a species can move, however. “The ranges of plant and animal species have moved, abundance has altered, and seasonal patterns of activities have shifted in response…”. A species is a collection of individuals which can shift. A species cannot decide to move its range as implied by this wording. (Embarrassingly I have used it myself – but it is wrong). (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
183	TS	9	5	9	5	Please provide some assesment of the extent of plant and animal species that moved ranges (some? most? a few?) (UNITED STATES OF AMERICA)
184	TS	9	6	9	6	Please insert (bold letters words): "…activities or community composition in response…." (Chapter 18, P 3, l.40-43). (GERMANY)
185	TS	9	7	9	7	Have broad patterns of species and biome movements been seen for animals, plant, both? (UNITED STATES OF AMERICA)
186	TS	9	7	9	9	Please clarify what is meant by distant and recent past. (UNITED STATES OF AMERICA)
187	TS	9	9	9	9	Please consider adding "(i.e. phenology)" if that is what is meant by seasonal activity here so that it reads "Seasonal activity (i.e. phenology)…". (NORWAY)
188	TS	9	9	9	10	Seasonal activity…….What does this sentence mean? In particular, what is meant by "seasonal activity"? (UNITED STATES OF AMERICA)
189	TS	9	10	9	11	The text states "Species have already started to migrate out of protected areas and towards mountaintops over the last several decades due to warming climate". Comment: This sentence is copied from TS, P 34 L 1-2 where it is embedded in a paragraph dealing with effects of climate change on species that are primarily restricted to protected areas. Although the sentence is correct, it may lead in the given context of P 9 of the TS to the misinterpretation that species migrate in particular out of protected areas (although range shifts are occurring in protected as well as in unprotected areas). Suggestion: please delete the sentence and add instead at the end of the second phrase of this paragraph (L 9) the words "as well as for the present" so the whole sentence would read: "The broad patterns of species and biome movements towards the poles and higher altitude in response to a warming climate are well established for the distant and recent past as well as for the present". (GERMANY)
190	TS	9	17	9	19	This sentence, about past climate analogues is important and should be highlighted. (UNITED STATES OF AMERICA)
191	TS	9	20	0	0	Please insert (bold letters words): "In freshwater ecosystems of most….. Due to many confounding factors [18.3.2.4, 18.5]" (based on executive summary Ch 18 P 3 L 40-43). (GERMANY)
192	TS	9	21	9	23	The statement is incomprehensible. (GERMANY)
193	TS	9	21	9	24	The important point here is not the low confidence to which recent species extinctions can be attributed to climate change, but that it is very difficult to attribute climate change to species extinctions due to confounding factors such as habitat loss/fr (NORWAY)
194	TS	9	23	0	24	Degree of confidence in attribution to climate change in subsection 18.3.2.3 of WGIIAR5-Chap18_SODall (lines 23-30, p. 17) states "in the case of Central American amphibians, climate change has been invoked as a causal factor in extinction but there is low agreement among investigators concerning the importance of climate variation in driving extinction and even less agreement that extinctions were caused by global warming as contrasted with that of subsection 4.3.2 of WGIIAR5-Chap4_SODall (lines 42-47, p.32) which states that "In contrast,changes in climate have been identified as one of the key drivers of the extinction of amphibians ". (Tibig, Lourdes, The Manila Observatory)
195	TS	9	23	9	24	A recent study does not support the links between high temperatures and mortality of amphibians infected with this pathogen (Bustamante et al 2010; Robinet and Roques 2010.).\nRobinet C and Roques A 2010. Direct impacts of recent climate warming on insect populations Integrative Zoology 5: 132-142\nBustamante HM, Livo LJ and Carey C. 2010. Effects of temperature and hydric environment on survival of the Panamanian Golden Frog infected with a athogenic chytrid fungus. Integrative Zoology 5: 143-153 (Zhang, Zhibin, Institute of Zoology, Chinese Academy of Sciences)

#	Ch	From Page	From Line	To Page	To Line	Comment
196	TS	9	23	9	24	What other factors are likely driving amphibian extinctions? It seems unlikely that this is all due to climate. What about human encroachment and land use? Please provide at least acknowledgement of other factors. (UNITED STATES OF AMERICA)
197	TS	9	23	9	24	A recent study does not support the linkage between high temperatures and mortality of amphibians infected with this pathogen (Bustamante et al 2010; Robinet and Roques 2010.).\nReference?\nRobinet C and Roques A 2010. Direct impacts of recent climate warming on insect populations Integrative Zoology 5: 132-142\nBustamante HM, Livo LJ and Carey C. 2010. Effects of temperature and hydric environment on survival of the Panamanian Golden Frog infected with a athogenic chytrid fungus. Integrative Zoology 5: 143-153\n (PAN, Jiahua, Chinese Academy of Social Sciences)
198	TS	9	26	9	38	Wind storms are an element of the climate system, but the others are not and, except with some of the later examples, this paragraph does not clarify the relation between trends in the non-climatic features and climate change. (Stone, Dáithí, University of Cape Town)
199	TS	9	29	9	29	Spatially patchy transitions (pls. define this term) ? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
200	TS	9	29	9	36	Forest dieback (ie like effect from mountain pine beetle, in B.C Canada) significant GHG risk as source (if burnt). (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
201	TS	9	32	9	42	The statements on tree mortality and its attribution to climate change around line 30 and those around line 41 are not consistent. (GERMANY)
202	TS	9	35	0	36	In Table 18-7, degree of confidence in attribution to climate change of the increase in tree mortality at regional scales and insect infestation in forests in western and boreal north America is low. (Tibig, Lourdes, The Manila Observatory)
203	TS	9	35	9	38	In addition, there is a significant literature showing that fire suppression and management have been largely responsible for degraded forests and catastrophic fire. (UNITED STATES OF AMERICA)
204	TS	9	40	9	41	Please add uncertainty qualifiers throughout the text, for example in this statement. (GERMANY)
205	TS	9	43	9	44	A very strong position taken (on the Amazon) and even though it may be elaborated well in chapter 18, a brief explanation would strengthen the position taken\n\n (NETHERLANDS)
206	TS	9	46	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
207	TS	9	46	0	0	Asia is not included in this section of examples and it may be important to include especially with consideration to China as a very quickly growing economy with accompanying drastic land use change-ths should be checked with Chapter 24 (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
208	TS	9	46	0	53	It is suggested that to be consistent, chapter sections in square brackets indicating levels of confidence in detection and attribution, including those in regional levels, should include those of Chapter 18 (i.e., Tables 18-6, 18-7, 18-8) (Tibig, Lourdes, The Manila Observatory)

#	Ch	From Page	From Line	To Page	To Line	Comment
209	TS	9	46	10	23	Need to add examples in Asia showing the complexity on response of species to temperature change. By using nearly over thousands yrs' historical data, it was found locust outbreaks are more linked to high frequency of droughts in cold periods in China (Stige et al. 2007; Zhang et al. 2009;Tian et al. 2011). This finding is different with the observation on the positive relation between locust and temperature with decadal scale (Ma 1958; Ma et al., 1965). Xu et al. (2011) found that the intensity of the third plague pandemic was positively associated with precipitation of previous years in dry northern China, but negatively associated previous years in damp southern China. Jiang et al. (2011) report that many rodent species in Inner Mongolia grassland of China, e.g. hibernating species, showed positive response in abundance to temperature increase; but a few showed negative response, probably due to they do not like high vegetation or rainfall induced by increased temperature. Yan et al. (2012) found increase of irrigation area in North China Plain offset the positive effect of global warming on winter reproduction and abundance of a hamster species in winter, causing continued decline of the population during past 2 decades. (Zhang, Zhibin, Institute of Zoology, Chinese Academy of Sciences)
210	TS	9	46	10	23	References:\nXu L, Liu Q, Stige LC et al. (2011). Nonlinear effect of climate on plague during the third pandemic in China. PNAS 108, 10214–9.\nTian H., Stige L. C., Cazelles B., Kausrud K. L., Svarverud R., Stenseth N. C.* and Zhang,Z.B.*. 2011. Reconstruction of a 1,910-y-long locust series reveals consistent associations with climate fluctuations in China. PNAS, 108: 14521–14526.\nMa (1958) The population dynamics of the oriental migratory locust (Locusta migratoria manilensis) in China. Acta Entomol Sin 8:1–40.\nMa S, Ding Y,Li D (1965) Study on long-term prediction of locust population fluctuations. Acta Entomol Sin 14:319–338.\nStige LC, Chan KS,Zhang Z, Frank D, Stenseth NC (2007) Thousand-year-long Chinese time series reveals climatic forcing of decadal locust dynamics. Proc Natl Acad Sci USA 104:16188–16193.\nZhang Z, et al. (2009) Periodic temperature-associated drought/flood drives locust plagues in China. Proc R Soc Lond Ser B Biol Sci 276:823–831.\nJiang G, Zhao T, Liu J, Xu L, Yu G, He H, Krebs CJ, Zhang Z (2011). Effects of ENSO-linked climate and vegetation on population dynamics of sympatric rodent species in semi-arid grasslands of Inner Mongolia, China. Canadian Journal of Zoology 89, 678–691.\nYan C, L. Xu, T. Xu, X. Cao, F. Wang, S. Wang, S. Hao, H. Yang and Z. Zhang. 2012. Agricultural irrigation mediates climatic effects and density dependence in population dynamics of Chinese striped hamster in North China Plain. Journal of Animal Ecology 2:1365-2656. (Zhang, Zhibin, Institute of Zoology, Chinese Academy of Sciences)
211	TS	9	46	10	23	No Asian examples are provided for terrestrial and inland water systems. A suggested addition is: "In Asia, the Altai-Sayan, Pamir and Tien Shan glaciers have lost on average 10% of their area an 15% of their ice volume since 1960. Rates of further glacier degradation depend mainly on increased in summer air temperature and changes in precipitation. (TS page 8 lines 27-29)" (JAPAN)
212	TS	9	46	10	23	No Asian examples are provided for terrestrial and inland water systems. A suggested addition is: "Regional studies in northern and eastern China and in Japan, using observational or satellite data, have shown earlier greening in spring, delayed senescence in autumn, and thus a longer growing season, associated with rising temperatures, although the details vary between sites and species.(Chapter 24 page 12 lines 18-21)" (JAPAN)
213	TS	9	46	10	23	No Asian examples are provided for terrestrial and inland water systems. A suggested addition is: "In Uttarakhand in the Indian Himalayas, the treeline has moved upwards into the alpine zone by an average of 388 m between the 1970s and 2006. (Chapter 24 page 13 lines 52-54)" (JAPAN)
214	TS	9	46	10	23	No Asian examples are provided for terrestrial and inland water systems. A suggested addition is: "Climate change has driven larch stand crown closure, and larch invasion into tundra at the rate of 3-10 m/year was observed in the northern forest-tundra ecotone in Siberia in the last three decades of the 20th century. (Chapter 24 page 14 lines 10-12)" (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
215	TS	9	46	10	23	Information on climate change impacts to regional terrestrial ecosystems is given here but without an example of Asia, a region that is ecologically and environmentally vulnerable to global climate change. It is suggested to add examples of Asia taking into account Table TS.1. (CHINA)
216	TS	9	46	10	23	Need to add examples in Asia showing the complexity on response of species to temperature change. By using nearly over thousands yrs' historical data, it was found locust outbreaks are more linked to high frequency of droughts in cold periods in China (Stige et al. 2007; Zhang et al. 2009;Tian et al. 2011). This finding is different with the observation on the positive relation between locust and temperature with decadal scale (Ma 1958; Ma et al., 1965). Xu et al. (2011) found that the intensity of the third plague pandemic was positively associated with precipitation of previous years in dry northern China, but negatively associated previous years in damp southern China. Jiang et al. (2011) report that many rodent species in Inner Mongolia grassland of China, e.g. hibernating species, showed positive response in abundance to temperature increase; but a few showed negative response, probably due to they do not like high vegetation or rainfall induced by increased temperature. Yan et al. (2012) found increase of irrigation area in North China Plain offset the positive effect of global warming on winter reproduction and abundance of a hamster species in winter, causing continued decline of the population during past 2 decades. \nReference?\nXu L, Liu Q, Stige LC et al. (2011). Nonlinear effect of climate on plague during the third pandemic in China. PNAS 108, 10214–9.\nTian H., Stige L. C., Cazelles B., Kausrud K. L., Svarverud R., Stenseth N. C.* and Zhang,Z.B.*. 2011. Reconstruction of a 1,910-y-long locust series reveals consistent associations with climate fluctuations in China. PNAS, 108: 14521–14526. \nMa (1958) The population dynamics of the oriental migratory locust (Locusta migratoria manilensis) in China. Acta Entomol Sin 8:1–40. \nMa S, Ding Y,Li D (1965) Study on long-term prediction of locust population fluctuations. Acta Entomol Sin 14:319–338. \nStige LC, Chan KS,Zhang Z, Frank D, Stenseth NC (2007) Thousand-year-long Chinese time series reveals climatic forcing of decadal locust dynamics. Proc Natl Acad Sci USA 104:16188–16193.\nZhang Z, et al. (2009) Periodic temperature-associated drought/flood drives locust plagues in China. Proc R Soc Lond Ser B Biol Sci 276:823–831.\nJiang G, Zhao T, Liu J, Xu L, Yu G, He H, Krebs CJ, Zhang Z (2011). Effects of ENSO-linked climate and vegetation on population dynamics of sympatric rodent species in semi-arid grasslands of Inner Mongolia, China. Canadian Journal of Zoology 89, 678–691. \nYan C, L. Xu, T. Xu, X. Cao, F. Wang, S. Wang, S. Hao, H. Yang and Z. Zhang. 2012. Agricultural irrigation mediates climatic effects and density dependence in population dynamics of Chinese striped hamster in North China Plain. Journal of Animal Ecology 2:1365-2656.\n (PAN, Jiahua, Chinese Academy of Social Sciences)
217	TS	9	47	9	48	In Europe is repeted twice in same sentence (Cristini, Luisa, University of Hawaii)
218	TS	9	48	0	0	Remove 'in Europe' (Donnelly, Alison, Trinity College Dublin)
219	TS	9	49	0	0	Remove 'in Europe' (Donnelly, Alison, Trinity College Dublin)
220	TS	9	52	0	0	Please insert the additional message: "Climate change in Europe…." (Ch. 23 P 3 L 17-19) (GERMANY)
221	TS	9	52	9	53	This statement is confounded by historic land use and management practices, which should be acknowledged. (UNITED STATES OF AMERICA)
222	TS	10	5	10	5	0.29% is NOT the current value but it is the value for the period 2005-2010 (Ch27 pg10 line 12)\n\n (NETHERLANDS)
223	TS	10	5	10	6	Meaningless. Is %/year meant? (Ingram, William, Met Office)
224	TS	10	6	10	6	Chaco forest deforestation rate is not mentioned in Ch27.2.2.1. DELETE Chaco forest\n\n (NETHERLANDS)
225	TS	10	7	0	0	Does the term 'Conversion' generally consider anthropogenic activities? Please specify. (GERMANY)
226	TS	10	7	10	12	Climate change is not mentioned as a factor for climate change impacts and vulnerability in Central and South America. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
227	TS	10	8	10	10	The use of the acronym RCPs is confusing since it is not defined in the text. There is need to define what the acronym stands for before its usage since it is widely used in many pages of the document including the Box sum. 4 figures1 A&B on pages 35 and 36 respectively. (KENYA)
228	TS	10	10	13	14	Evidence of change in Antarctic terrestrial systems is confined to a couple of flowering plants. The referenced section (28.2.3.7) considered the lack of taxonomic coverage in the Antarctic to be a major gap. Perhaps including Antarctic using the same brush as for Arctic is overstating? (UNITED STATES OF AMERICA)
229	TS	10	10	30	31	It's not just eutrophication from land - but also upwelled waters tend to have lower pH - would be worth including mention of this here. (UNITED STATES OF AMERICA)
230	TS	10	10	30	31	This statement could be misleading since in other coastal areas OA can be less than in the open ocean. Section 5.3.3.5 only emphasizes that coastal biogeochemical processes mean that pH is more variable and that the records are insufficient to parse out among the large spatial and temporal variability. (UNITED STATES OF AMERICA)
231	TS	10	10	42	44	An additional (primary) factor in regional variability is differential changes in land surface elevation, whether from subsidence or isostatic rebound. The former may be partially attributable to human-caused changes in sedimentation, but the latter cannot. (UNITED STATES OF AMERICA)
232	TS	10	10	42	44	The term "precludes" seem overly strong. Examples in section 5.4.2 show sea level related impacts, but parsing out attribution between multiple SLR, temp change and other human drivers remains difficult. It seems strange that Section 5.4.4 makes no mention of sea level rise, yet this statement strongly states that detection is not possible. (UNITED STATES OF AMERICA)
233	TS	10	11	10	12	Please delete this last sentence. It suggests that loss of biodiversity is not that serious, because there is still a lot left. (GERMANY)
234	TS	10	16	0	55	Same comment as above (Tibig, Lourdes, The Manila Observatory)
235	TS	10	19	10	21	Some studies suggest that the boreal forest tree line moved southwards in response to the Little Ice Age, and is now moving northwards owing to the warmer conditions. Some northward movement may therefore have happened even without anthropogenic climate change. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
236	TS	10	23	0	0	Please add the message: "Summer phytoplankton levels…" (Ch 28 P 4 L19-20), very high confidence. (GERMANY)
237	TS	10	28	10	35	There is no evidence that variability in pH value of seawater has any deliterious effect on marine organisms. Yiu even admit this on page 54 line 46 to 47 (Gray, Vincent, Climate Consultant)
238	TS	10	29	10	30	More than 70% of the world's coastlines has significantly warm during the past 30 years (missing source here)? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
239	TS	10	29	10	30	This sentence states: 'More than 70% of the world's coastlines have significantly warmed', while Chapter 5, p.9,line 43 states: 'Sea surface temperature has significantly warmed during the past 30 years along more than 70% of the world's coastlines'. There is a difference between coastlines that are warmed, and sea surface temperature along the coastline that has warmed. Suggestion: 'More than 70% of the coastal waters...'\n\n (NETHERLANDS)
240	TS	10	32	10	33	It should read "decreased rates of calcification in some areas and species" (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
241	TS	10	39	10	39	..loss of reef building corals.. this is ambiguous. Loss can mean wither reduction in abunbance or complete removal. Please clarify. (IRELAND)
242	TS	10	42	10	43	Isn't it also relevant that many of the expected impacts of sea-level rise are by worsening rare catastrophic events, for which statistical sampling is inevitably problematic? (Ingram, William, Met Office)

#	Ch	From Page	From Line	To Page	To Line	Comment
243	TS	10	42	10	44	Sea level rise is clear attributably to climate change, so what does this statement mean? Is it that other changes in coastal areas (outside the arctic) have masked the impact of climate change? Even so, it is difficult to understand that these impacts cannot be separted from hte idrect impact changing sea level. More clarity required on this topic. (IRELAND)
244	TS	10	43	10	44	Doesn't this statement contradict the example of North America (p.10, line 47-49) where sea-level rise is mentioned as impacting factor. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
245	TS	10	46	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
246	TS	10	46	11	4	There is no example from Asia, however Asia is very important, please add example from Asia. (wang, chunfeng, State Forestry Administration, China)
247	TS	10	46	11	4	There is no description about Asia. SUGGESTION: add description about Asia. (PAN, Jiahua, Chinese Academy of Social Sciences)
248	TS	10	46	11	5	Please include an example from Europe (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
249	TS	10	46	11	5	Please add uncertainties to all statements. (GERMANY)
250	TS	10	46	11	5	No Asian examples are provided for coastal systems and low-lying areas. A suggested addition is: "Increases in coastal water temperatures are also one of the most plausible explanations for widespread declines in beds of large seaweeds in temperate Japan: the Isoyake phenomenon (Nagai et al., 2011)(Chapter 24 page 20 lines 48-50)" (JAPAN)
251	TS	10	46	11	5	No Asian examples are provided for coastal systems and low-lying areas. A suggested addition is: "Warming coastal waters have also been implicated in the northwards expansion in Japanese waters of tropical and subtropical macroalgae and toxic phytoplankton (Nagai et al, 2011), fish (Tian et al., 2012), and tropical corals, including key reef-forming species (Yamano et al.,2011), over recent decades. (Chapter 24 page 20 lines 50-53)" (JAPAN)
252	TS	10	46	11	5	No Asian examples are provided for coastal systems and low-lying areas. A suggested addition is: "The decline of large temperate seaweeds and expansion of tropical species in southwest Japan has been linked to rising sea surface temperatures (Tanaka et al., 2012b), and the changes in the seaweed community have, in turn, impacted fish communities (Terazono et al., 2012). (Chapter 24 page 20 line53- page 21 line 2)" (JAPAN)
253	TS	10	46	11	5	No Asian impacts are provided for coastal systems and low-lying areas. A suggested addition is: "Average erosion rates of Asian Arctic coastlines range from 0.27m/year (Chukchi Sea) to 0.87m/year (East Siberian Sea). (Chapter 24 page 21 lines 8-9)" (JAPAN)
254	TS	10	51	10	51	Reference to 1970s comes from Table 25-3, not this Chapter reference (25.6.2).\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
255	TS	10	53	10	53	Unique human and natural systems tend to have very limited adaptive capacity is here related to "unique" and the threshold of 2 degrees. However "adaptive capacity", as presented in chapter 8, (see chapter 8, page 72, line 53, also TS page 58, line 50, page 14, line 23, chart in page 106 and figures page 112 and 113, SPM charts page 30 and page 43) is also basis for major goal and sole necessary key concept for paradigmatic shifts in urban traditions. Also for "differential adaptive capacity for individuals, households, and communities" in TS, page 7, lines 1 and 2).\nIn SPM, page 5, line 52 "Adaptive capacity is generally high in many Australasian human systems" in page 6, line 8 "In the Arctic, indigenous people have a high adaptive capacity".\nAlso UHI experience variations from city centres to the peripheries of higher ranges.\nSuggest contextual improvement so that key concept does not weaken. The clarification is probably the "intrinsic capacity" which has thresholds and the "acquirable capacity", namely by learning, which does not have (known) thresholds.\nTS, Page 60, line 21 "Such limits are context-specific and subject to uncertainty". (not referred in SPM).\nTS, Page 28, lines 14 to 15 "Any assessment of limits to adaptation in human systems is preliminary because of uncertainty about the existence and level of adaptation limits, and whether these limits are hard or soft."\n\n (NETHERLANDS)
256	TS	11	3	11	3	What is meant by "composition" of sea ice in this context? Are you refering to structure and texture or is this a refererence to natural and/or anthrogoenic particles? (IRELAND)
257	TS	11	4	0	0	Add transportation safety (CONNOR LAJAMBE, Hélène, HELIO International)
258	TS	11	4	11	4	Are there other non-indigenous peoples that are affected? (UNITED STATES OF AMERICA)
259	TS	11	8	13	28	The section on marine impacts is overdeveloped compared to others. Most evidence is presented as high confidence. Is this a signal of real higher evidence in marine areas compared to others? This is not reflected in the SPM, where marine areas are summarized in just one paragraph. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
260	TS	11	10	11	15	Significantly, this depends on the assumptions. \n\n (NETHERLANDS)
261	TS	11	10	11	15	Chapter 30.6 should be added to the source as well.\nThe whole statements should also mention that not all the aforementioned changes occur all over the world. The changes in particular area are highly subjected to the geographical configurations, social-economic conditions, and management regime.\nIn Line 12, maybe it is necessary to put natural-triggered climate change as well.\n\n\n (NETHERLANDS)
262	TS	11	12	0	0	Please insert (bold letters): "…such as regional circulation intensity,…" (because according AR 5 WG I, there are no signals regarding a general decline of ocean circulation intensity (WG I Ch.3.6.). (GERMANY)
263	TS	11	13	11	14	The observation that changes to oceanic systems have led to changes in organisms and ecosystems both is happening now and in the past (geological record). It is good to mention that such changes have been observed in the geological record, so that the changes observed now can be understood within a framework of extant knowledge. Also, add references to 6.1.2 and 6.3.3\n\n (NETHERLANDS)
264	TS	11	28	11	29	Do these references support or replicate Figure TS1? (UNITED STATES OF AMERICA)
265	TS	11	31	0	38	Same comment as above (Tibig, Lourdes, The Manila Observatory)
266	TS	11	31	11	32	Are the authors saying that changes in body size occur on seasonal or decadal timeframes (as opposed to evolutionary time frames)? (UNITED STATES OF AMERICA)
267	TS	11	32	0	0	Consider adding (phenology) after 'activities'. I think it is important to highlight the fact that 'timing of seasonal activitities of organisms' and 'phenology' are the same thing, throughout the document. (Donnelly, Alison, Trinity College Dublin)
268	TS	11	32	11	32	It should read ...."reduction in their body size in some areas".... (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
269	TS	11	35	11	35	Algae as well? Phytoplankton? There are examples of poleward shifts. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
270	TS	11	40	0	0	amplification doesn't make sense - I guess "local amplification" is meant? (Ingram, William, Met Office)
271	TS	11	52	12	26	also pp 113, 114, Figure TS 1: Panel A is difficult to intrepret. Consider more clarity in text, or new design of graphic to clearly illustrate the messages. Labels "Tpejus", and "Tp" are used, text indicates that Tp is appropriate (typo but confusing). Text refers to "southern spring" , this is ambiguous. "Low latitude Spring" would be better. (IRELAND)
272	TS	12	12	26	1	This section could be shortened significantly. (UNITED STATES OF AMERICA)
273	TS	12	12	34	34	Reference to 6.2.6 needs to be removed from this section. The section does not exist in Chapter 6. (UNITED STATES OF AMERICA)
274	TS	12	12	37	43	The statement that "Field observations attributed to anthropogenic ocean acidification are few due to limited change in water chemistry between the pre-industrial times and today" is misleading and contradictory with other statements in Chapters 6 and 30 indicating that the changes in water chemistry are significant and rates of change unprecedented in millions of years. The changes in water chemistry since pre-industrial times are significant. The complication with respect to attributing field observations to anthropogenic OA is due primarily to the confounding factors of multiple stressors affecting marine organisms in most regions. This statement should be rewritten to appropriately reflect that fact. Additionally, lines 42-43 should be rewritten to read, "Ecosystems at risk of ocean acidification also include warm and cold water coral reefs." Finally, the list of references to chapters should include 6.1.1.2 and CC-OA in addition to those listed. (UNITED STATES OF AMERICA)
275	TS	12	12	41	41	We believe the effects of high CO2 on oyster cultures was characterized as Low Evidence and Agreement (6.3), suggesting that this is not a "high confidence" statement. This again highlights the critical need for care in translating findings from the underlying chapters to the TS (and SPM). (UNITED STATES OF AMERICA)
276	TS	12	14	12	15	It doesn't say in the caption what sort of organisms are featured "only warm-temperate pseudo-oceanic species" - I presume that the figure is for copepods??? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
277	TS	12	30	12	30	The sentence mentioned sensitivity. The sensitivity has not explained in the chapter before. If the chapter still use it, it may be need to mentioned in Box TS 2. (Schipper, Lisa, Stockholm Environment Institute)
278	TS	12	37	12	37	Anthropogenic ocean acidification should be defined somewhere here? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
279	TS	12	37	12	38	Is this statement consistent with others about ocean and coastal acidification? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
280	TS	12	45	12	50	There is a need to quantify these differnet responses. What are the net impacts on fish based diet, livelihoods. Which are the vulnerable fish and human communities. (IRELAND)
281	TS	12	45	12	50	Perhaps add some text that reflects an assessment on climate - perhaps as the driver of changes in sea ice, warming. (UNITED STATES OF AMERICA)
282	TS	12	54	0	0	Please insert "…, regionally reduced intensity of ocean circulation,..", because a general reduced intensity of ocean circulation is not confirmed by IPCC AR5 WGI (chapter 3.6.). (GERMANY)
283	TS	12	54	12	54	Please check that the suggestion of "reduced intensity of ocean circulation" is consistent with WGI findings, especially chapter 3 (and chapters within this report). (BELGIUM)
284	TS	13	5	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
285	TS	13	5	13	7	It would be necessary to mention which particular oceans or seas the examples are referring to. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
286	TS	13	6	0	8	Same comment as above (Tibig, Lourdes, The Manila Observatory)

#	Ch	From Page	From Line	To Page	To Line	Comment
287	TS	13	6	13	6	It should read ...."ranges of some marine fishes"... As the papers point out that many species do not show any significant response. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
288	TS	13	9	13	16	Chapter 30.6.2.1.3 should be added as the source as it strongly related with that statements.\nAlso, this paragraph can be improved by explaining the impacts i.e. conflicting between fishing, and the solution i.e. collaboration for the fisheries framework or during the decision making process.\n\n\n (NETHERLANDS)
289	TS	13	13	2	3	Reference to section 6.2.4 should not be included in this section because it focuses on the effects of temperature and ocean acidification on macrophytes, and is not relevant to a discussion of hypoxia. Additionally, there is no section 6.2.6 in Chapter 6 of the WGII document. (UNITED STATES OF AMERICA)
290	TS	13	13	15	16	There is no section 30.8.3 in Chapter 30 of the WGII document. Please verify and remove. (UNITED STATES OF AMERICA)
291	TS	13	13	22	22	Section 30.5.6 is on sub-tropical gyres and is not relevant to the discussion of semi-enclosed seas. Reference to this section should be removed, and reference to section 30.5.3 on semi-enclosed seas should be included. (UNITED STATES OF AMERICA)
292	TS	13	13	28	28	Reference to section 30.5.6 on sub-tropical gyres should be included at the end of this bulleted statement. (UNITED STATES OF AMERICA)
293	TS	13	16	13	16	There is no section as 30.8.3, actually the chapter 30 goes as far as 30.7. It is possible that this was referenced before a chapter rearegwment.\n\n (NETHERLANDS)
294	TS	13	17	13	18	Maybe is better to rephrase as "Semi-Enclosed Seas show significant warming since early 1980's, …" instead of 1982. \n\n (NETHERLANDS)
295	TS	13	17	13	28	Figure 30-15 and Chapter 30.6 should be added to the source\n\n (NETHERLANDS)
296	TS	13	23	13	23	Delete “(through intensified upwelling)” (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
297	TS	13	23	13	23	Editorial comment : "through intensified upwelling" is repeated twice. Please clarify this sentence. (BELGIUM)
298	TS	13	26	13	29	Possible contradiction here. Re-phrase? A decrease in primary productivity would decrease organic material and hence substrates for metabolism. There would be less oxygen demand?? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
299	TS	13	28	13	28	Rising temperature would also affect solubility of gases such as O2. Worth mentioning? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
300	TS	13	29	0	0	Please add as additional bullet-point:" In the Arctic and Antarctic environmental changes and ecosystem responses …" (Ch.28, P3, l. 1-3) high confidence; " Some marine species will shift…" (Ch. 28, P3, l. 9-10) medium confidence. (GERMANY)
301	TS	13	31	14	9	Can the authors provide any findings related to animal based agricultrue, including pastural systems and more intensive grazing and feeding systems, especially in light of project increase in global demand for beef and dairy produce in developing economies. (IRELAND)
302	TS	13	31	14	9	This section is disproportionally short relative to other sections (UNITED STATES OF AMERICA)
303	TS	13	33	13	38	The messages here on regional impacts on yields is confusing, especially the different high,medium and low confidences attached to similar statements. For example there is high confidecne of positive impacts on "trends" (of what?) at high latitudes. Yet in hte next sentenec there is low confidene in increased yields due to warming and CO2 in mid-high latitudes. Need more clarity and consistency on the use of language here. (IRELAND)
304	TS	13	33	13	42	A sub-sentence addressing the likely economic effects and behavioural response of climate change-induced effects on food production should be added to this paragraph. Paragraph 7.3.3. would be a good source for information on this. \n\n (NETHERLANDS)
305	TS	13	34	13	35	Please highlight this important statement in bold. (GERMANY)
306	TS	13	35	13	36	Yields have increased in some (mid to high latitude regions). What yields and of what ? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)

#	Ch	From Page	From Line	To Page	To Line	Comment
307	TS	13	38	13	38	The sentence "Demonstrating ...variability." This claim is tenacious at best, and is insufficiently supported by the material presented in Chapter 7 The Chapter provides ample and convincing support for (mostly negative) influences of climate change on yield and provides some relevant projections of yield decreases in the future. However, there is hardly any evidence presented to support the claim that current climatic events are already influencing these prices. In contrast, figure 7-4 depicts a strong correlation with oil production and the resulting effects on biofuel demands, while the text on multiple locations extensively mentions other factors than climate change, such as (biofuel) policies, increasing demand for food and population size increases as important factors for food price increases. In the only study presented accounting for this proposed relationship already in the present (Lobell et al. 2011), this aspect is only touched upon very peripherally. The authors of the SPM are advised to rewrite this sentence.\nThey should make the logical argument that supply decreases due to yield decreases (which are well supported) combined with demand increases due to population growth and changing food consumption patterns and other economical factors are likely to cause price increases. Disentangling climate change components in food prices is still an unresolved question and demonstrating the reactivity of markets to Climate change is complex as many economic (e.g. production and transaction costs, speculation, expectations) and social forces interplay in very dynamic conditions.\nSupport can be found in Chapter 7, page 6 line-49 ff , page 10 line-14 ff, page 24-line 43 ff.\n\n\n (NETHERLANDS)
308	TS	13	38	13	39	It is reasonable to state than not all recent price changes can be attributed to climate change, however some market events where a direct response to actions taken due to food security concerns arising from exception conditions which themselves have been attributed (at least in part) to climate change. For example the peak in food prices following damage to crops, and ban on exports during the 2010 heat wave in Russia (Otto, Masset et al, GRL, 2012) Vol 39, Issue 4; The Impact of Russia's 2010 Grain Export 2 Ban, Oxfam Research Report, June 2011). (IRELAND)
309	TS	13	40	13	40	For the social and economic issues: add market effects/speculation? (Huggel, Christian, University of Zurich)
310	TS	13	40	13	41	Can this statement be justified? A severe climate event such as the 2010 Russia heat wave and drought, or the 2011 Texas could occur at any stage in a major food producing region. This cannot be predicted, but nor can it be discounted. Analysis of the 2010 Russia drought indicated that the probablity of such events have increased signitifcantly (e.g. Rahmstorf and Coumou, 2011, PNAS Vol 108, No. 44, 17905-17909). At best one can state that it is "likely" that the factors indicated will remain the the main drivers, although I also question the prominence given to energy policy in this statement. (IRELAND)
311	TS	13	40	13	42	This is an important finding and should be given additional prominence in the document. (UNITED STATES OF AMERICA)
312	TS	13	46	13	46	Insert "storage" (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
313	TS	13	52	13	52	Consider to include the very relevant finding in chapter 7 page 2 line 49-53. (NORWAY)
314	TS	13	53	14	9	No Asian examples are provided for food production systems and food security. Examples in Asian countries are required. (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
315	TS	13	54	14	3	The African example quoted is inconsistent with the policy statement in line 44-46. The example given that livelihood-based approaches for managing risks to food production from multiple stressors including rainfall variability, have increased substanatially since 2007, seems inconsistent with the policy statement which refers to new understanding of the sensitivity of crops to extreme heat. Instead the authors could cite reduction in growing seasons length, increase in pests and diseaseson crops and livestock. In addition there is inconsistency in the messages in terms of where the level of high confidence is assigned. The Excutive summary (page 4 Line 1-11) assigns high confidence to the fact that while efforts are being achieved in managing risks to food production, these will likely not be sufficient to address long-term risks from climate change. On the other hand, the technical summary (page 13 Line 54-56 to page 14 Line 1-3) instead assigns high confidence level to statement "livelihood approaches for managing risks to food production from multiple stressors including rainfall variability, have increased substanatially since 2007.\n\n (NETHERLANDS)
316	TS	13	56	13	56	Collaborative participatory research should be in the glossary on page 3. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
317	TS	13	56	14	3	An example for protecting livelihoods in a changing climate is the Rural Resilience initiative (R4) which is directed to low income farmers in Africa. The R4 launched by Oxfam America and the World Food Programme with the supoort of Swiss Re helps low income farmers to protect their crops and incomes through insurcen. It gives poor farmes and rural households the option to pay for insurance by contributing their time and labour to local climate adapation measures, such as crop irrigation and forestry project. Read more on http://www.swissre.com/rethinking/crm/The_R4_Rural_Resilience_Initiative.html (Mueller, Lea, Swiss Reinsurance Company Ltd)
318	TS	14	4	0	5	Same comment as above (Tibig, Lourdes, The Manila Observatory)
319	TS	14	14	14	19	Whilst this may be so, developed countries expanded their cities in areas absent of climate change considerations and do indeed face considerable financial challenges of adapting them and resource challenges (water) of supplying them. Is this sentence perhaps too uniform statement that hides variation between but also within developed and developing countries, some (by no means all) of which will benefit from a clean slate opportunity to get some basic climate-focused planning in place using simple approaches - if only limited to risk limitation? (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
320	TS	14	14	14	30	There is no mention of land use or urban planning as an adaptation measure and a factor for reducing climate risk. This can be an essential adaptation measure facing future urban developments. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
321	TS	14	15	14	16	To my knowledge, geo-hydrologic hazards is not a very common term. What is it actually? Mainly floods? (Huggel, Christian, University of Zurich)
322	TS	14	18	0	19	Please clarify what is meant by "novel compound risks and slow onset hazards", and why resulting impacts on resilience of ecosystems are included here (as part of the discussion of Urban Areas)? (GERMANY)
323	TS	14	18	14	19	While it is easy to say that reducing deficits and building resilient infrastructure are important, the authors should also address the offsets, compromises and costs associated with this. (UNITED STATES OF AMERICA)
324	TS	14	21	14	21	Around 1 billion people live in informal settlements in urban areas (need to define "informal settlements" ?). Of these categorize as 'urban poor' or squatter ?settlements (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
325	TS	14	23	14	23	Need to define adaptive capacity in terms of urban areas ? This is quite different than adaptive capacity in rural areas (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
326	TS	14	28	14	30	This sentence references Ch 8 key findings, but Ch 8 reflects challenges in high income as well as other nations. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
327	TS	14	28	14	30	This statement is simply not true as presently worded. Suggest removing the last phrase about how high-income nations will not be affected. In fact, high-income nations will be hit with extraordinary costs that may be impossible to bear. (UNITED STATES OF AMERICA)
328	TS	14	32	0	0	There are certainly more examples of impacts in urban settlements that can be reported here. Also, this section is rather general. Given the clear statements in L 14-19 about vulnerability and past exposure, more information about actual observed impacts should be available, and summarized here. (GERMANY)
329	TS	14	32	0	0	Examples of urban areas? (Stone, Dáithí, University of Cape Town)
330	TS	14	32	14	42	No Asian examples are provided for urban systems. A suggested addition is: "Many cities in Asian high growth economies are located on low-lying coastal areas, which are undergoing rapid urban and economic transformation. (Chapter 8 page 4 lines 19-20)" (JAPAN)
331	TS	14	32	14	42	As no Asian examples have been provided for urban systems, examples are to be added. (JAPAN)
332	TS	14	32	14	42	No Asian examples have been provided for urban systems. Furthermore, although reference is made to the exacerbation of hazards and disaster risks by climate change including inland and coastal flooding in a preceding paragraph, no such examples have been provided. (JAPAN)
333	TS	14	33	0	0	This may also apply to large cities in Asia such as Tokyo, Shanghi- I am not sure of the evidence though, check with Chapter 24 (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
334	TS	14	33	14	34	Should the logic not rather be: impacts on social and economic systems? Can examples be given? (Huggel, Christian, University of Zurich)
335	TS	14	38	14	40	Why are there higher risks in coastal and dry areas versus coastal, or humid? This statement either needs a reference or needs to be generalized or removed. (UNITED STATES OF AMERICA)
336	TS	14	48	14	49	No need for this issue on definitions of urban areas. It also clashes with the first statement. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
337	TS	14	53	14	56	I think the “medium confidence” applies to the last part beginning “but evidence for”, right? At the moment it sounds like it applies to the entire bold sentence. (Stone, Dáithí, University of Cape Town)
338	TS	14	55	14	55	What does 'action of non-climatic shocks and trends' mean? Are these other drivers of change? (Huggel, Christian, University of Zurich)
339	TS	14	56	15	2	This is also true for Australia, the US SW, etc….not just the Andes (UNITED STATES OF AMERICA)
340	TS	15	2	15	2	I suggest including: glacier melt in many regions such as the Andes, Alps, or the Arctic (Huggel, Christian, University of Zurich)
341	TS	15	2	15	2	Why mention only the Andes here? Enhanced glacer melt attributable to climate change is far more widely observed. See for instance chapter 4 in the upcoming WGI IPCC report, especially figure 4.9 and 4.10 and the summary statement that there is “robust evidence in high agreement that globally glaciers continue to shrink and loose mass. See also Blunden, J., and D. S. Arndt, Eds., 2012: State of the Climate in 2011. Bull. Amer. Meteor. Soc ., 93 (7), S1–S264 (ICELAND)
342	TS	15	7	15	9	Are poverty rates falling in rural because of migration to cities? Re-vitalization or not? Economies? Why especially Sub-Saharan Africa? (UNITED STATES OF AMERICA)
343	TS	15	11	15	29	These two paragraphs describe issues in developing countries, but there are also examples in North America and other places. As it currently reads, it sounds quite biased. Suggest generalizing the attribution. (UNITED STATES OF AMERICA)
344	TS	15	23	15	23	Resilience needs to be defined in the glossary (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
345	TS	15	31	0	0	Examples of rural areas? (Stone, Dáithí, University of Cape Town)

#	Ch	From Page	From Line	To Page	To Line	Comment
346	TS	15	31	15	31	Specific region examples could be expanded particularly in the Pacific island region and small coastal rural areas on low-lying atolls (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
347	TS	15	31	15	33	I suggest to include some more examples on specific regions. E.g. from Africa, South America, Asia. (Huggel, Christian, University of Zurich)
348	TS	15	31	15	33	There are certainly more specific regional examples of impacts in rural areas that can be reported here. (GERMANY)
349	TS	15	36	15	36	It is not clear to an outsider what an economic sector might be (UNITED STATES OF AMERICA)
350	TS	15	36	15	55	Impacts and adaptation in key economic sectors should be an important chapter of the TS. The section is too short. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
351	TS	15	36	15	55	There is no para summarizing these cc-impacts on ' Key economic sectors and services' in the SPM. (GERMANY)
352	TS	15	36	15	55	Please provide explanation on the definition of the concept of "key" sectors and services, and then provide specific examples supporting this concept. The current section is rather short given its relevance for decision making and text remains quite vague. (GERMANY)
353	TS	15	36	15	55	This section is disproportionally short. Suggest a more consistent approach to level of detail, and thus section length. (UNITED STATES OF AMERICA)
354	TS	15	38	15	39	A confidence assessment is needed. (Stone, Dáithí, University of Cape Town)
355	TS	15	38	15	42	The level of confidence is missing in this para. (GERMANY)
356	TS	15	38	15	42	Why no confident level assessment followed after this conclusion? (PAN, Jiahua, Chinese Academy of Social Sciences)
357	TS	15	42	15	42	The 'documented contribution of climate change' could be contested here. It is mostly climate variability and in some cases there may be some contribution of climate change, e.g. if climate change is considered to have contributed to some change in weather extremes, or longer dry periods. Reword, e.g. as follows: ...,but there are increasing indications that climate change and variability are contributing to economic losses. (Huggel, Christian, University of Zurich)
358	TS	15	44	15	47	Is this a description of the sensitivity of the insurance sector, or a statement about observed impacts on that sector? Please clarify. (GERMANY)
359	TS	15	44	15	47	As a major global reinsurer and in the role as an ultimate risk taker Swiss Re is strongly exposed to the potential impacts of climate change. Tropical cyclones, or hurricanes as they are often referred to in the North Atlantic region, have been a major source of large losses for Swiss Re in the past. Hurricane Katrina in 2005 provides an example of this. At the time of that event Swiss Re announced an estimated loss of US$ 1.2 billion for its share. For Swiss Re climate change is an issue of long-term, group-wide strategic importance and therefore a component of our long-term risk management strategy. Swiss Re's action are based on the premise that it is in the interest of its shareholders, clients and employees, the wider stakeholder community and society in general to tackle the issue of climate change. For more information please refer to http://www.swissre.com/rethinking/sustainable_energy/our_position_and_objectives.html (Mueller, Lea, Swiss Reinsurance Company Ltd)
360	TS	15	44	15	47	Insured losses are increasing in frequency and severity. This development is primarily due to higher insurance penetration, growing technological vulnerability and value concentrations in exposed areas. At the same time, there is increasing evidence that climate variability and climate change are affecting the cat perils market. (Mueller, Lea, Swiss Reinsurance Company Ltd)

#	Ch	From Page	From Line	To Page	To Line	Comment
361	TS	15	44	15	55	Europe seems to be leaning towards attributing some of the causalities of natural events like floods to actual developments while for some other continents the attribution of causality seems sometimes to lean towards climate change. There may be need for a deeper analysis of the argumentation underpinning the different attributions since I noted a stark difference between the other examples and Africa, e.g. the Africa examples seem very weak.The other examples for other continents seem stronger; Asia is however barely mentioned apart from the fact that Asia is insufficiently represented in the studies. In the recent past Asia has experienced enormous catastrophes so that it seems imperative to spend more attention to (examples from) Asia\n\n (NETHERLANDS)
362	TS	15	46	15	46	The term "particularly in low and middle income countries"most of the low and middle income countries barely have formal insurance systems that may be strongly affected by climate change especially if we are referring to adaptation and vulnerability because of varied reasons - we might need to re-check the statement unless it also refers to informal insurance systems.\n\n (NETHERLANDS)
363	TS	15	47	15	47	This sentence implies that economic vulnerability reduction through insurance is always effective, whereas 10.7 clearly indicates that this depends heavily on the situation and on the insurance mechanism. It would be more accurate to add "under certain circumstances" to the end of this sentence.\n\n (NETHERLANDS)
364	TS	15	49	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
365	TS	15	54	15	54	Use the term "permafrost thaw" instead of "permafrost melt" which is incorrect terminology. This revision probably needs to be made in various chapters. Note that it is only the ice in the frozen ground (permafrost) that melts, not the soil or rock that contains it. Therefore the term thaw is correct (Smith, Sharon, Geological Survey of Canada)
366	TS	16	4	16	4	Are human health populations sensitive to all/some shifts? (UNITED STATES OF AMERICA)
367	TS	16	8	16	11	What about effects of heat and aerosols? Ozone? (UNITED STATES OF AMERICA)
368	TS	16	8	16	17	Repetitive text. Please remove. (UNITED STATES OF AMERICA)
369	TS	16	13	16	15	More likelihood/confidence assessments are needed for the various components of the sentence. (Stone, Dáithí, University of Cape Town)
370	TS	16	13	16	20	Reporting relatively low confidence of studies without considering nor mentioning the difficulties of quantitative assessment for the complex mechanisms involved in health impacts from climate change as well as difficulties in health assessment, can lead to misunderstanding that climate change hardly has any impact on health or that there are insufficient evidences to prove its impact on health. (REPUBLIC OF KOREA)
371	TS	16	17	16	18	Is it acceptable to assess that the increasing trend of Dengue fever and malaria were attributed to climate change only with very low confidence? A higher confidence can be assigned. (PAN, Jiahua, Chinese Academy of Social Sciences)
372	TS	16	21	16	25	The term "climate altering pollutant" is unclear. Pollutants need to have a media/pool/reservoir to contaminate like air/atmosphere, water, soil which affect human health and ecosystems directly. GHGs are not regarded as pollutants. It seems however, that they are meant by the term pollutant here. The new meaning added to the term "pollutant" causes confusion and inconsistencies. Please revise. In addition, it is unclear, if the number 7 % refers to inhalation of all air pollutants (e.g. including NO2) or only to those air pollutants substances with an important climate altering effect? (GERMANY)
373	TS	16	22	0	0	Cultural heritage is raised here as threatened by climate change. Is it sufficiently raised earlier on as a contributing or mitigating factor (e.g. in adaptation/transformation), regardless of whether this is in relation to developed or developing countries? This is a sensitive issue that needs to be included - mindsets that refuse to accept climate change, or potential ways to embark on climate resilient development, may be based on reasonable or unreasonable assumptions which in turn may prove to be detrimental - or not - whether by accident or design (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)

#	Ch	From Page	From Line	To Page	To Line	Comment
374	TS	16	22	16	26	This statement, and Box 11.4, on which the finding in based, regarding the other health implciations for all non-CO2 climate forcers is incorrect. The statement is too general. The discussion and finds are broadly related to particulate polluntants and as such are limit to a range of radiatively active species. Ozone could also be included in this discussion. N2O and CH4 have no known health impacts at ambient atmospheric concentrations. Likewise, CFCs and HCFCs have no direct impact, but are of concern due to impact of stratopheric ozone. (IRELAND)
375	TS	16	28	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
376	TS	16	28	16	40	The reference to Table TS.1 is confusing since the table does not exactly reflect the points mentioned here and is rather general (hardly mentioning specific health impacts). If referring to this table maybe add: 'for an overview of further general observed impacts in the regions see table TS1...'. Best would be though if there was a specific table on regional health impacts instead. (GERMANY)
377	TS	16	28	16	40	Asia is expected to have considerable impacts of climate change on health and it is the most populated continent. Therefore, the regional cases of Asia should be included. (REPUBLIC OF KOREA)
378	TS	16	28	16	40	Asian examples are missing regarding human health. A suggested addition is: "Associations between temperature rise and mortality have been shown for India, Thailand, and several cities in East Asia, including Japan, South Korea, China and Taiwan. Intense heat waves have also been shown to affect outdoor workers in South and East Asia."(Chapter 24 page 34 lines 21-26) (JAPAN)
379	TS	16	28	16	40	Asian examples are missing regarding human health. A suggested addition is: "Prolonged drought in combination with windy conditions increases the exposure to sand and dust, often mixed with toxic compounds. There are indications that dust storms in South West Central and East Asia increase hospital admissions and worsen asthmatic conditions, as well as causing skin and eye irritations. Prolonged drought may also lead to wildfires and haze exposures, with increased morbidity and mortality as observed in Southeast Asia. Drought can also cause disruption of food security that leads to increases of malnutrition and consequently increase susceptibility to infectious diseases. (Chapter 24 page 34 lines 28-34) (JAPAN)
380	TS	16	28	16	40	Asian examples are missing regarding human health. A suggested addition is: "Increases in temperatures have been correlated with outbreaks of waterborne diseases in for example East Asia. Other studies from South and East Asia have shown a correlation between diarrheal outbreaks and a combination of higher temperatures and heavy rainfall." (JAPAN)
381	TS	16	28	16	40	Asian examples are missing regarding human health. A suggested addition is: "Cholera outbreaks in coastal populations in South Asia have been associated with increasing water temperatures and algal blooms." (JAPAN)
382	TS	16	29	16	31	The word "inadequate" is missing in the technical summary but it appears in the Excutive summary of Chpater 22 on page 4 Line 30. Proposed "In Africa, climate change is a multiplier of existing vulnerabilities affecting health outcomes (high confidence), including inadequate water and sanitation coverage, food security, and access to health care and education.\n\n (NETHERLANDS)
383	TS	16	32	16	33	Please double check if the example for Europe is appropriate here since it is not reflected under the health section of the regional chapter 23, P25ff (there are several other examples under the health section there though, as well as in the executive summary Ch 23 P 4 l.13ff.) In addition, the low confidence example for Europe should be replaced by an other example of medium or high confidence, if possible. (GERMANY)
384	TS	16	34	0	37	Same comment as above (Tibig, Lourdes, The Manila Observatory)
385	TS	16	45	0	0	How does this positive framing of mobility relate to statements made on page 12, row 45 of SPM and on page 7 line 47. (Sönke, Kreft, United Nations University - Institute for Environmental and Human Security)
386	TS	16	45	16	46	Is the difference between mobility and migration clear enough here? Many ways of defining, including scope for ther to be little difference between them (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)

#	Ch	From Page	From Line	To Page	To Line	Comment
387	TS	16	47	16	48	What constitutes or facilitates an ability to move? It's not just about being poor. (UNITED STATES OF AMERICA)
388	TS	16	49	16	51	What does "expanding opportunities for mobility" mean as an adaptation option? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
389	TS	16	51	16	51	Change reference to 12.4.2 There is no 12.4.3! \n\n (NETHERLANDS)
390	TS	17	4	17	6	Why? Does this not speak to resilience opportunities? Must these factors all be present to mitigate violence? It would seem that education, sanitation and proper nutrition also would be important mitigation factors. (UNITED STATES OF AMERICA)
391	TS	17	11	17	13	Does conflict DRIVE or exacerbate vulnerability? (UNITED STATES OF AMERICA)
392	TS	17	15	17	19	This paragraph is unclear and vague. "Many indigenous peoples" (Who? where?) …"have adapted" (when? To what?). The evidence for this statement should be clarified. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
393	TS	17	21	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
394	TS	17	21	17	35	An example from Africa should be added (important links to security). (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
395	TS	17	22	0	0	It is not clear what this statement refers to. Please specify cultural heritage. The section and table provided as reference do not contain specific references to observed impacts, or confidence statements. (GERMANY)
396	TS	17	22	0	0	I don't see why a low confidence prediction for European cultural heritage is one of the regional examples in the discussion of human security. More salient examples from Africa and on more important effects on human well-being (namely survival) would seem to be more relevant than whether or not Venice retains its cultural charm. (Joshua, Busby, University of Texas-Austin)
397	TS	17	22	17	22	Has climate change affected pre-industrial revolutionary cultural heritage? (UNITED STATES OF AMERICA)
398	TS	17	23	17	23	Indigenous people have higher than average exposure to climate change due to a heavy reliance on climate sensitive primary industry. This is a bit of an ambiguous statement. What does higher than average exposure mean has to be backed up by a source or reference). (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
399	TS	17	23	17	31	Not clear what the evidence is for economic opportunities in forestry for Maori.\n\n (NETHERLANDS)
400	TS	17	31	17	31	In North America, pre-European settlement societies evolved in highly variable climate - it's exactly this component of climate change that led to adaptation to natural resources (food, water, land). There were also many instances of failure. See for example Hegmon et al., 2008 - Social Transformation and Its Human Costs in the PreHispanic U.S. Southwest that describes 3 societies, and in particular, the Hohokum and their failure to adapt to drought, largely because of their brittle society, and increased efforts to develop irrigation canals, denude their landscape. North American, Asian, African, etc societies were not allways successful at this. (UNITED STATES OF AMERICA)
401	TS	17	31	17	32	I'm not sure the unique history and relationship to the land is easily understood by a larger readership (Huggel, Christian, University of Zurich)
402	TS	17	33	17	35	Have western infrastructures (e.g., pipeline) influenced human/environmental interactions in the Arctic? (UNITED STATES OF AMERICA)
403	TS	17	38	17	38	Give the full meaning of the acronyme REDD before its usage in the text of the document. (KENYA)
404	TS	17	40	17	41	Does climate change always constitute an additional burden to poor? This seems biased. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
405	TS	17	40	18	9	DEVELOPING COUNTRIES ARE MORE AFFECTED BY CLIMATE CHANGE THAN DEVELOPED COUNTRIES. In some developing countries, climate-related disasters could shave off up to 19 percent from annual national income by 2030, according to studies on the economics of climate adaptation (ECA) in different parts of the world. The risks they face span from more frequent and severe storms, floods, droughts and other natural hazards to sea-level rise, crop failures, and water shortages. In some cases, one single large disaster can set back years of development gains.\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)
406	TS	17	46	17	47	Do urban and rural transient poor always slide into poverty? Are there also opportunities? (UNITED STATES OF AMERICA)
407	TS	17	48	17	51	This statement can be very important. If duly supported by evidence and agreement, it should be highlighted (and probably sent to the SPM) (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
408	TS	17	48	17	51	What about extreme weather events and agricultural failures? (UNITED STATES OF AMERICA)
409	TS	17	53	17	54	Does climate change always worsen poverty? Are there no other factors? (UNITED STATES OF AMERICA)
410	TS	17	53	18	6	Given the emphasis the TS places on this socioeconomic stressor, there should be a stronger evidence base. The report should concentrate on literature findings. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
411	TS	17	56	18	9	Are socially marginalized societies always negatively affected by climate? Are there no examples of improvements? There are drivers that are non-climatically related with climate as a contributing factor. Sometimes, the affluent can respond or take advantage, sometimes, the affluent are destroyed. It's not all about climate, and it's not all about being poor. Suggest a reconsideration of these statements. (UNITED STATES OF AMERICA)
412	TS	18	1	18	1	The term "gender" should be replaced by the term "sex". Hence "…the intersection of sex, age, race…" (see also comment on TS P5 line 47). (GERMANY)
413	TS	18	3	18	4	Do the authors intend to say that pre-existing gender inequalities are exasperated by weather events? This should be explained, or revised. (UNITED STATES OF AMERICA)
414	TS	18	6	18	9	This statement on very poor evidence of positive impacts should be deleted. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
415	TS	18	8	18	9	Sometimes more affluent portions of society can recover but not always. (UNITED STATES OF AMERICA)
416	TS	18	11	18	15	This paragraph can be omitted (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
417	TS	18	11	18	15	Should not environmental factors be added to 'social and economic factors' listed here? The complexity of understanding social and ecological systems - e.g. in relation to how climate impacts play out across ecosystem components, linkages and scales affecting marine fisheries - suggests that perhaps they should be. (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
418	TS	18	13	18	25	In some areas there is no manifest desire among national governments to delegate power to local levels due to histories of centralised control currently maintained by party machineries that see general but also political benefits in the arrangement. As everywhere, it is not always just a lack of capacity and institutional strength - but the will to act while trusting others who may be opposed to your views and powerbase. (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
419	TS	18	22	18	25	This finding, that uncertainties have not been reduced and in some cases have increased, is an important one and warrants a more prominent place in the document. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
420	TS	18	23	18	25	There is a bit of a debate going on how the increasing range projected by newer generations of climate models is communicated. Stating that the uncertainty has increased is likely not the best way. Maybe say: have increased the range of possible outcomes. (Huggel, Christian, University of Zurich)
421	TS	18	25	0	0	Please replace the term "uncertainty" by "diversity", because the real uncertainty did not increase by including more processes into the models, but the differences between models (i.e. model diversity) increased, showing the effect of until then unknown uncertainties. (GERMANY)
422	TS	18	29	18	30	This sentence is very true, but why not add that here precipitation change will often be comparably or more important than temperature change? (Ingram, William, Met Office)
423	TS	18	38	21	27	The report provides many general statements about adaptation processes, but specific examples of adaptation experience in sectors or areas are missing. Sectoral and transectoral approaches are essential, and also coastal adaptation is mentioned specifically. What about other experiences in mainstreaming, capacity building, governance, etc? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
424	TS	18	40	18	41	The statement that natural systems have some potential to adapt is misleading. Natural systems have enormous potential to adapt as evidenced by the persistence of life on earth over the millennia. The authors are strongly encouraged to present a more thoughtful analysis of the flexibility of natural systems (UNITED STATES OF AMERICA)
425	TS	18	40	18	44	This paragraphy seems unnecessary and fails to note that natural systems have been adapting to climate change for millenia. (UNITED STATES OF AMERICA)
426	TS	18	40	19	39	A more over mention of risks of maladaptation might be a welcome, if cautionary, note here albeit mentioned on p.23 (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
427	TS	18	41	18	41	Saying 'through ecological and evolutionary processes', but only 'evolutionary proccessess' can be founded in [14.1].\n\n (NETHERLANDS)
428	TS	18	44	18	44	Saying 'reducing existing adaptation deficits' is not founded in [14.1], actually the terminology 'adaptation deficits‘ only occurs in [14.7.4].\n\n (NETHERLANDS)
429	TS	18	52	18	52	How have social dimensions attracted more attention? Has some profile or awareness increased? (UNITED STATES OF AMERICA)
430	TS	18	53	18	55	This is an awkward sentence. Please re-word for clarity. (UNITED STATES OF AMERICA)
431	TS	18	55	19	1	Why this explicit reference to hard infrastructure? Most strategies currently stress the need for no-regrets, win-win, mainstreaming, etc. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
432	TS	18	55	19	1	Europe and Australasia have moved steps ahead in terms of trying to ensure that risk -reduction is not just left to the modelers but the citizens are actually engaged. There have been emerging initiatives including the WeSenseit Citizen Observatory of Water which is a four year European Framework 7 funded project. The project is aimed at developing a citizen-based observatory of water, which will allow citizens and communities to become active stakeholders in information capturing, evaluation and communication http://www.wesenseit.com/web/guest/home . Prior to this there were other similar initiatives but the one that comes to mind is the Eye on Earth (Partnership between the European Environment Agency and Microsoft) http://eyeonearth.cloudapp.net/, these initiatives should be recognised and small steps being made to move away from the top-down approach mentioned in the report.\n\n (NETHERLANDS)
433	TS	18	55	19	1	This sentence needs clarification or removal. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
434	TS	19	2	0	0	Please look at mandates of NAPAs. NAPA is about identifying urgent and immediate adaptation needs, and not a long-term strategy. The UNFCCC implementation of National Adaptation Planning is in its infancy. There are promising country examples such as the Bangladesh Climate Change and Action Plan. (Sönke, Kreft, United Nations University - Institute for Environmental and Human Security)
435	TS	19	3	19	3	What is a NAPA? (UNITED STATES OF AMERICA)
436	TS	19	5	19	7	Should you please provide more information to support this statement as we cannot draw such a conclusion from [14.5.3,14.5.4]. By the way, [14.5.1] perhaps should be referred as to support of this argument?\n\n (NETHERLANDS)
437	TS	19	5	19	7	The logic behind this heirarchy is unclear. The previous paragraph had engineered systems as top down. (UNITED STATES OF AMERICA)
438	TS	19	5	19	27	A good example for a comprehensive adaptation assessment is the Economics of Climate Adaptation (ECA) Methodology. The Economics of Climate Adaptation (ECA) methodology provides decision-makers with a fact base to tackle climate adaptatin in a systematic way. It enables them to understand the impact of climate change on their economies - and identify actions to minimize that impact at the lowest cost to society. It therefore allows decision-makers to integrate adaptation with economic development and sustainable growth. See http://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf \nhttp://www.swissre.com/rethinking/climate_and_natural_disaster_risk/shaping_climate_resilient_development.html\n\nCase studies on US-Florida, UK-City of Hull, India, Guyana, Tanzania, Mali, China and Samoa are included in the report. They found that existing climate patterns are responsible for annualized losses of 1-12% of GDP and are likely to rise up to 19% of GDP by 2030. This is a worrying trend. But the good news is that cost-effective adaptation measures can prevent anywhere between 40 and 68 percent of the expected economic loss in the regions studied.\n\nThe Economics of Climate Adaptation working group is a partnership between the Global Environment Facility, McKinsey & Company, Swiss Re, the Rockefeller Foundation, ClimateWorks Foundation, the European Commission, and Standard Chartered Bank. (Mueller, Lea, Swiss Reinsurance Company Ltd)
439	TS	19	8	19	9	Saying 'very few assessing the process of …'. However, similar statement cannot be found in [14.5.3,14.5.4].\n\n (NETHERLANDS)
440	TS	19	9	11	19	This sentence should be printed in bold (please add uncertainty). (GERMANY)
441	TS	19	15	19	15	We do not know why same statement cited by ExSum of Chapter 14 with high agreement, while here with high confidence.\n\n (NETHERLANDS)
442	TS	19	15	19	15	Are adaptation evaluations in their infancy for societally relevant processes? Natural ecosystems? (UNITED STATES OF AMERICA)
443	TS	19	15	19	20	There is no mention of the wealth of information on adaptation from the agricultural community. This community has a long history of crop adaptation strategies to climate change. Probably one of the earliest in the US, and still significant, is the establishement of the SCS in response to the dust bowl and poor cropping practices. (UNITED STATES OF AMERICA)
444	TS	19	22	19	23	A statement on the experiences and lessons learnt with the different tools would be extremely helpful. Currently, the statement is quite obvious. (GERMANY)
445	TS	19	29	19	39	Scale is important. Not just the national level. Many decisions are made at local and regional scales. There is also no mention of the relevance or import of global scale roles? (UNITED STATES OF AMERICA)
446	TS	19	34	11	35	This sentence should be printed in bold (please add uncertainty). (GERMANY)
447	TS	19	38	11	39	This sentence should be printed in bold (please add uncertainty). (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
448	TS	19	41	0	0	South America is also another example here. Colombia´s government in the National Development Plan 2010-2014 determined that the country should establish a National Climate Change Adaptation Plan. Therefore, the National Planning Department (DNP) is currently working on the formulation of this plan with the support of the Ministry of Environment and Sustainable Development (MADS), Institute of Hydrology Meteorology and Environmental Studies of Colombia (IDEAM), and National Unit for Disaster Risk Management (UNGRD). (COLOMBIA)
449	TS	19	41	19	51	(Same as SPM, page 5, from line 31) The process has been modelled in existing literature and coined as "learning alliances" concerning the development of interpretation among stakeholders (understand why they need to engage with adaptation) and "learning active alliances" concerning developing intervention with stakeholders (initiate measures).\nAshley, R., Blanskby, J., Newman, R., Gersonius, B., Poole, A., Lindley, G., Smith, S., Ogden, S., Nowell, R., 2012. Learning and action alliances to build capacity for flood resilience. Journal of Flood Risk Management 5, 14 - 22.\nVan Herk, S., Zevenbergen, C., Ashley, R., Rijke, J., 2011. Learning and Action Alliances for the integration of flood risk management into urban planning: a new framework from empirical evidence from The Netherlands. Environmental Science & Policy 14, 543 - 554.\n\n (NETHERLANDS)
450	TS	19	41	21	26	The difference between the bullet points on adaptation experiences for specific geographic contexts (i.e. regions) and those listed in Table TS.3 is not obvious. Clarity and comprehensibility would be improved by including all examples into table TS.3. Uncertainty needs to added to each key statement. (GERMANY)
451	TS	19	41	21	26	Table TS.3 is redundant to the text. Consider simplifying the table with novel examples not presented in the text? (UNITED STATES OF AMERICA)
452	TS	19	46	19	46	“experience of implementing adaptation plans” better? Rather than “adaptation implementation experience”. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
453	TS	20	1	20	7	Maybe worth mentioning the Economics of Climate Adaptation case for the city of Hull, UK. \nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf#page=100\nhttp://media.swissre.com/documents/Economics_of_Climate_Adaption_UK_Factsheet1.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)
454	TS	20	3	20	4	..is being slowly build in some parts the world " (ambiguous statement). Which parts of the world ? (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
455	TS	20	4	20	7	feedback mechanisms are important for building urban resilience (high agreement, medium evidence).\nLacks the distinction between positive and negative feedbacks, i.e. those that bring systems beyond tipping points (positive feedbacks) and therefore have a negative impact and those that have capacity to restore equilibriums (negative feedback) and therefore have a positive impact .\n\n (NETHERLANDS)
456	TS	20	9	20	10	Gender, the supply of information for decision-making. Omit "gender (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
457	TS	20	10	20	12	It is unclear what the constraints are. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
458	TS	20	41	22	13	Asian examples of adaptation experiences are missing. A suggested addition is: "While some practical experiences of adaptation in Asia at the regional, national and local level are emerging, there can be barriers that impede or limit adaptation. These can include the lack of financial resources for adaptation implementation, institutional barriers, biophysical limits to ecosystem adaptation and others (Chapter 24 page 40 lines 1-3)." (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
459	TS	20	45	20	53	Maybe worth mentioning the Economics of Climate Adaptation case for the US Gulf coast and the utility company Entergy - even on sector and company level there is adaptation action\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf#page=105\nhttp://media.swissre.com/documents/Entergy_study_exec_report_20101014.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)
460	TS	20	51	20	52	The line "There are few examples of proactive adaptation … energy and public infrastructure." is not found in the body of Chapter 26.7 as it is cited. In fact, on Chapter 26 page 26 line 48, referring to infrastructures it states that "only an emerging consideration of proactive adaptation in anticipation of future global warming" suggests that proactive adaptation has not begun, and is only beginning to be considered. \n\n (NETHERLANDS)
461	TS	21	1	0	0	The statement has been made that "indigenous people have a high adaptive capacity" with reference to Sections 28.2.4, 28.2.7 and 28.4.1. Section 28.2.4 and 28.3.7 does not indicate that in the present the adaptive capacity is high. Rather "the ability of indigenous peoples to maintain livelihoods, ... is increasingly being threatened by climate change" and "in recent years these successful adaptation strategies ... have been challenged at unprecedented rates". Section 28.4.1 has a balanced analysis of this question and seems to be indicate aspects of both higher and lower current adaptive capacity of indigenous people. The threat to adaptive capacity via social or physical stressors should be fairly reported in section 21.1 at the same time as recognizing the historical and potential adaptive capacity of indigenous Arctic people. \n (CANADA)
462	TS	21	1	21	3	Does this statement withstand the headlong rush by Arctic communities into hydrocarbons development, both in onshore and offshore areas already most affected by the impacts of carbon-based development further south? Surely repeating the pattern is not climate-resilient development? (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
463	TS	21	1	21	3	The level of confidence is missing in this para. (GERMANY)
464	TS	21	1	21	3	Level of confidence of that statement not mentioned\n\n (NETHERLANDS)
465	TS	21	1	21	3	It is not entirely clear why a reference is made to the section 28.2.4, as this section describes the direct and indirect impacts of climate change on the indegenous people, but does not directly support the statement from the SPM: "in the arctic … with scientific partners". Rather, it appears that only the co-production of studies on the impacts of climate change is discussed in these sections.\n\n (NETHERLANDS)
466	TS	21	1	21	3	This statement is supposedly based on Section 28.2.7 from Chapter 28, but this section does not exist in the main chapter. Perhaps the layout of the chapter has been changed, without updating the references in the SPM/TS\n\n (NETHERLANDS)
467	TS	21	21	4	13	Lines 6-13 are more generally applicable than Coastal specific statements. One meaningful take away from Ch 5 is that assessments of the state of coastal adaptation to date have primarily focused on "protection" options, and on hard structures within the protection category, but that accomodation and retreat options also need to be assessed. (UNITED STATES OF AMERICA)
468	TS	22	1	22	12	Understanding approaches to managing risk through adaptation. Determinants of risk should be framed within effective adaptation (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
469	TS	22	6	0	0	The concept of the era of climate responsibility / option is not clear enough. Does the first mean that there are no options, and the latter that there is no responsibility? The time frames should be defined more clearly. A box on the two eras would be useful, which can then be referred to throughout the TS. F605 (GERMANY)
470	TS	22	11	22	12	References to transformation should be better explained and justified. What does it exactly mean? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
471	TS	22	15	0	0	Please rename Section B.i. "Structure and Elements of Iterative Risk Management". Section is not dealing with determinants of risk management. (GERMANY)
472	TS	22	22	40	48	It is important to recognize that locally-obtained adaptations may be in conflict with neighboring solutions, and will not necessarily be locally, regionally, or globally optimal. This same observation is made on page 23 lines 27-31. The factor to emphasize here is not necessarily the top-down flow of risk information, but the top down flow of policy and information on the consequences of alternative adaptation strategies that should guide selection of more appropriate courses of action at regional/local levels. In other words, a local solution is not necessarily a national/regional solution. (UNITED STATES OF AMERICA)
473	TS	22	25	22	25	Delete “Schematic of” (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
474	TS	22	28	22	28	Please write out what Section C.ii. Refers to (UNITED STATES OF AMERICA)
475	TS	22	29	22	30	This statement is not true. Suggest removing the figure and revising the text. (UNITED STATES OF AMERICA)
476	TS	22	35	0	0	Section B.ii. deals with (few) enhancing factors for effective adaptation (and not with principles). We suggest to rename the section in "Enhancing Factors for Effective Adaptation". (GERMANY)
477	TS	22	45	22	47	SME's, etc will pursue as long as there is economic gain to be had. (UNITED STATES OF AMERICA)
478	TS	22	50	23	2	The power of reputational risk should not be omitted or underestimated here. Beyond straight metrics as mentioned in the text, the overnight adjustment of consumer preferences and power can be determinant. Perhaps worth a mention? Just as consumers may not wish to buy clothes from manufacturers using building that collapse on workers, so they may be able to influence their suppliers on climate if benchmarks for ranking are trusted. There are plenty of examples of this already - although public doubt over climate change, and its relegation in recent years to a lesser priority perhaps have worked against consumer power (e.g. in current recession). (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
479	TS	22	50	23	2	Inconsistent message: The topic sentence of this paragraph in TS is the topic sentence of another paragraph in ExSum (chapter 17 page 2 lines 37, 38). \n\n (NETHERLANDS)
480	TS	23	4	23	19	Reference to 17.2.6; 17.3; 17.5.4 is missing in this statement whereas it is included in the SPM and in the ES\n\n (NETHERLANDS)
481	TS	23	8	23	8	What does the use of "actor" mean in this sense? (UNITED STATES OF AMERICA)
482	TS	23	19	23	19	Reference to pararaph 21.3 differs between TS and ExSum. TS cites 21.3 while ExSum 21.3.2. The latter is the most adequate. \n\n (NETHERLANDS)
483	TS	23	27	23	27	"Maladaptation" should be in glossery on page 3. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
484	TS	23	27	23	29	This statement originates from [14.7.3].\n\n (NETHERLANDS)
485	TS	23	27	23	29	It should be noted that maladaption and unintended consequences of what was considered to be a sound adaptation strategy are a cause of increasing concern. (UNITED STATES OF AMERICA)
486	TS	23	29	23	31	Maybe add “small-scale or local scale” and in “short-term, local scale outcomes”. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
487	TS	24	3	24	4	Are there any crosscuts with WGIII on mitigation? (UNITED STATES OF AMERICA)
488	TS	24	15	24	15	Is the correct text "…actions can be pursued now AND increase climate resilience…"? (GERMANY)
489	TS	24	15	24	22	Reference paragraph 17.4.4 does not exist\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
490	TS	24	18	24	22	This sentence is a long laundry list. While it's important to note how adaptation and resilience go hand in hand, perhaps it would be more useful to trace a single, clear example. Also, it is not allways possible to restore areas to some notion of pristine or pre-managed state. Careful and thoughtful analyses are needed to manage options for intended use versus the reality of the state a system may or may not be stable. This also goes to public perceptions of a 'healthy' ecosystem. (UNITED STATES OF AMERICA)
491	TS	24	19	24	19	You could include "recovery of healthy fish stocks" (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
492	TS	24	24	24	29	In the TS (page 24, line 24-29) it is stated that 'steps ARE BEING taken to achieve better integration', while the Executive summary of Chapter 15 (page 2, line 49 to page 3 line 5 and page 3 line 41-49) rather seems to convey that steps SHOULD be taken. \n\n (NETHERLANDS)
493	TS	24	31	24	38	This is a very important point that should be more clearly reflected also in SPM. (NORWAY)
494	TS	24	33	0	0	The text states "Ecosystem-based adaption is regarded as one of the more cost effective and sustainable approaches to urban adaptation, although the costs of needed land acquisition can be high." Comment: the last part of the sentence is misleading. Please delete or rephrase the last part of the sentence "...although the costs of needed land acquisition can be high" since not in all cases of ecosystem-based adaptation in urban areas land acquisition is needed. (see also chapter 8, page 75, lines 40-42). (GERMANY)
495	TS	24	33	24	34	This sentence is awkward. (UNITED STATES OF AMERICA)
496	TS	24	43	24	44	Integration of what? (UNITED STATES OF AMERICA)
497	TS	24	43	24	53	Reference paragraph 17.4.4 does not exist\n\n (NETHERLANDS)
498	TS	24	44	24	46	The statement is not directly reflected in executive summary\n\n (NETHERLANDS)
499	TS	24	52	24	53	Which cod stock? The cited paper covers Atlantic cod in general. The sentence applies to the North Sea cod and most of the US and Canadian stocks, but certainly not the Barents Sea stock. Easiest fix is to move this sentence to after the following one. (Ottersen, Geir, Institute of Marine Research)
500	TS	25	3	25	6	The sentence 'Due to the uncertainty, dynamic complexity and short to long timeframes associated with climate change, robust adaptation efforts require iterative risk management strategies.' is presented as main conclusion printed in bold in both the SPM and the TS, while in the Executive summary of Chapter 15 (page 3, line 48-49) it is merely a line appearing under another heading. Moreover, this statement does not appear at all in the main text of Chapter 15. So where is this conclusion actually underpinned in the main text?\n\n (NETHERLANDS)
501	TS	25	13	25	15	Could also mention that there are many metrics for evaluation but no consensus in the literature on which one(s) are best. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
502	TS	25	30	25	36	Neither the synthesis in chapter 16.5 nor the assessment of ethical dimensions of adaptation in Ch 16.6 support the thesis that all actors have opportunities for effective adaptation: The greater the magnitude of climate change, the greater the likelihood that adaptation will encounter limits (executive summery Ch. 16). Additionally, the lower the adaptive capacity or the higher the vulnerability of actors, the greater the likelihood of no, ineffective or maladaptation. Especially the first sentence in bold letters is not valid in its generality. Furthermore we cannot follow the expert judgment of "medium agreement, medium evidence" as no literature source is given explicitly. Therefore, the first sentence in bold letters should be deleted. So the finding should begin with "Because adaptation … (Figure SPM.2A)", and this sentence should be highlighted (bold). (GERMANY)

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503	TS	25	38	25	39	In the process of development and implementation of adaptation plans, it is not enough to only focus on decision-making. It is necessary to obtain sufficient financial and technological support as well. Therefore, it is suggested to change “adaptation governance plays a key role to promote the transition from planning to implementation of adaptation” to “adaptation governance, including institution, finance, technology, incentives, information management etc., plays a key role to promote the transition from planning to implementation of adaptation.” (CHINA)
504	TS	25	38	25	50	Content of Ch 15 section 15.2.3 is not reflected well by the Executive summary (Ch 15, page 3, line 30-39) and the TS (page 25, line 38-50). Executive summary and TS are in agreement with each other, but not with the main text of the Chapter. For example, the statement that complementary top-down strategies are required couldn't be found in the main text of section 15.2.3 (it is actually in section 15.4.2, page 32 , line 12 and section 15.5, page 35, line 1) Similarly, the word 'bottom-up' does not even appear in the main text of Section 15.2.3.In section 15.2.4.4 or 15.4, these words are mentioned. Therefore, please be morte accurate in referencing the statement in th TS as well as in the Ex Sum of Ch. 15. \n\n (NETHERLANDS)
505	TS	25	52	25	52	This text presents the information much more clearly than the figure. Consider deleting the figure. (UNITED STATES OF AMERICA)
506	TS	25	56	25	56	figure TS.5 reads "efforts in adaptation CAN be, whereas chapter 15 reads "NEED to be" (Chapter15, caption of Figure 15.1, p.52)\n\n (NETHERLANDS)
507	TS	26	5	16	21	separate component (sub chapter) on Traditional Knowledge (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
508	TS	26	9	26	9	Are the authors referring to a diffusion process, or dissemination? (UNITED STATES OF AMERICA)
509	TS	26	12	26	14	Perhaps some more commentary needed in addition to the bold text? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
510	TS	26	26	16	21	The statement that "traditional and indigenous forms of knowledge" are a major resource for adaptation except where changes exceed the knowledge repertoire should be more carefully qualified. The implication made here is that the exceptional "changes" refer to climate. In fact, most facets of the social, economic, regulatory, and environmental baselines have changed over most of the globe relative to "traditional" knowledge baseline, hence there are many more reasons to question the utility of such knowledge in guiding adaptation than just cases when climate has shifted outside of the "repertoire." (UNITED STATES OF AMERICA)
511	TS	26	26	26	46	Risk financial mechanisms and economics of climate change should be separate sub chapter (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
512	TS	26	26	26	46	Insurance puts a price tag on risk and therefore incentivizes risk prevention and mitigation. Adaptation measures are available to make societies more resilient to the impacts of climate change. But decision makers need the facts to identify the most cost-effective investments. Climate adaptation is an urgent priority for the custodians of national and local economies, such as finance ministers and mayors - as well as to leaders in the private sector. Such decision makers ask: \nWhat is the potential climate-related loss to our economies and societies over the coming decades? \nHow much of that loss can we avert, with what measures? \nWhat investment will be required to fund those measures - and will the benefits of that investment outweigh the costs?\nThe Economics of Climate Adaptation (ECA) methodology provides decision makers with a fact base to answer these questions in a systematic way. It enables them to understand the impact of climate change on their economies - and identify actions to minimise that impact at the lowest cost to society. It therefore allows decision makers to integrate adaptation with economic development and sustainable growth. Find the publication on http://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)

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513	TS	26	27	26	27	Where does the "high confidence" come from? It is not found in the chapter summary for section 10.7 and 10.9. Is it based on one of the other sections (8.4,17.4 or 17.5) or should it be: "high agreement, robust evidence"?\n\n (NETHERLANDS)
514	TS	26	30	26	30	Institutions often include norms and regulations, therefore norms and regulations are similar to institutional innovations. Also, the main text 17.5 does not say about institutional innovations but R&D subsidies. Therefore, we suggest to change "institutional innovations" by "R&D subsidies". These comments are also mentioned for the SPM, ExSum and the main text 17.5. \n\n (NETHERLANDS)
515	TS	26	31	26	31	What does 'climate proof' mean? (UNITED STATES OF AMERICA)
516	TS	26	36	26	46	Paragraph 17.3.4 not relevant here\n\n (NETHERLANDS)
517	TS	26	38	26	38	Kinship networks and microfinance, even though relevant examples, are not covered in the main text. [Microfinance in Malawi is only mentioned as an example, but microfinance per se is not enumerated as one of possible instruments]\n\n (NETHERLANDS)
518	TS	26	42	26	43	Public private partnership is not covered in the main text in the context of risk sharing and insurance market, but uniquely within the framework of investment in paragraph 17.5.3\n\n (NETHERLANDS)
519	TS	26	45	26	45	Please provide explanation/examples for "many counteracting factors" (UNITED STATES OF AMERICA)
520	TS	26	51	27	2	References to transformation should be better explained and justified. What does it exactly mean? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
521	TS	26	51	27	2	Section 14.3.4 delivers a core message of the need for a co-practice of moving from traditional to transformational adaptation, and mainstreaming into development plans and strategies. However, this TS statement separates the two and over-emphasizes about transformational adaptation only while the need for subsequent mainstreaming is not mentioned there.\n\n (NETHERLANDS)
522	TS	26	53	26	53	Can the authors provide examples of 'low-regret' strategies that have been followed resulting in 'win-win'? (UNITED STATES OF AMERICA)
523	TS	27	6	27	7	Discussion in the literature also includes warnings and concerns about deliberately created transformations. E.g.: Meadowcroft, M., 2009, What about the politics? Sustainable development, transition management, and long-term energy transitions. Policy Sciences, vol. 42, iss. 4, pp 323-340. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. E.g.: Voss, J.-P., Bornemann, B., 2011, The politics of reflexive governance: challenges for designing adaptive management and transition management. Ecology & Society, vol. 16, iss. 2, art. 9.\n\n (NETHERLANDS)
524	TS	27	8	27	8	The idea of deliberately steering transformations that take place in interacting spheres is based on 1 source (O'Brien and Sygna, forthcoming) according to p. 24 of Chapter 20 . It would be more appropriate to state here that "deliberate transformations could possibly be deliberately triggered, and stimulated to take place accross interacting spheres".\n\n (NETHERLANDS)
525	TS	27	14	27	15	This figure is poorly explained and not easy to understand (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
526	TS	27	23	27	25	…….or, increased resilience but with undesireable outcomes (this goes to management objectives). A resilient ecosystem or society does not necessarily translate into a desireable functional outcome. (UNITED STATES OF AMERICA)
527	TS	27	24	27	24	This line could be more accurate as "…development will influence future human adaptive capacity and therefore its vulnerability,...". This if we are still considering that Vulnerability is a function of Exposure, Sensitivity and Adaptive Capacity, as the Fourth Assessment Report mentioned. (COLOMBIA)

#	Ch	From Page	From Line	To Page	To Line	Comment
528	TS	27	27	20	25	This statement ignores another salient constraint on adaptation: regulatory and policy requirements that have been put in place that are inappropriate to changing climatic conditions or that are based on too narrow a view regarding potential impacts in other domains. Please consider revising. (UNITED STATES OF AMERICA)
529	TS	27	30	27	30	It's not really proper to say that societies catastrophically fail. They transform in many ways. See e.g., Hegmon et al., 2008 example given for page 17, line 31. (UNITED STATES OF AMERICA)
530	TS	27	32	27	32	The end of this sentence does not make sense "….limits to adaptation….and environmental constraints……being reached…" (UNITED STATES OF AMERICA)
531	TS	27	45	27	45	Mitigation and adaptation are ….often….complementary. They can also offset each other and compromise in the decisionmaking processes is required for one versus the other. (UNITED STATES OF AMERICA)
532	TS	28	2	26	2	Strictly speaking it is individuals or populations that adapt not species. Maybe rephrase? Within species individuals and populations can adapt through phenotypic and genetic responses". (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
533	TS	28	6	28	6	…goods and services, shifts in ecological systems….hard limits This statement is vague (UNITED STATES OF AMERICA)
534	TS	28	17	0	0	Since limits to adaptation are geographical and time specific, this flows directly from the statement on page 27 line 35. However, do the authors of the chapter feel that the literature support to supplement the statement regarding the relative incidence of limits to adaptation in a <2 and >2 world? (Sönke, Kreft, United Nations University - Institute for Environmental and Human Security)
535	TS	28	17	28	20	This statment regarding the 2degree target may mislead the reader into thinking that avoiding "limits to adaptative capacity" across all systems is the objective of the target. The 2 degree target seeks to avoid unmanageble danagerous climate change. This is subjective in terms of what is considered dangerous in this global context, however, localised failures due to limtis of adaptation are inevitable at 2 degrees, which is implicitly recognised. (IRELAND)
536	TS	28	19	28	19	Insert "essentially arbitrary" to give "essentially arbitrary climate…." (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
537	TS	28	33	28	35	Statement is too vague. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
538	TS	28	33	28	35	Are limits to adaptation to climate change counfounded by human activities that have also contributed to change? YES. In many examples, these limits are tied to human management of landscapes and seascapes. Climate change is an additional stressor. (UNITED STATES OF AMERICA)
539	TS	28	33	28	35	Statement seems very general and applicable to every region, not necessarily Europe. I suggest to be more precise and describe specific examples (Cristini, Luisa, University of Hawaii)
540	TS	28	36	0	0	Please add as a 3rd bullet-point: "Although in the Arctic there is a general agreement…." (Ch. 28, P5, l 9-11); high confidence. (GERMANY)
541	TS	28	42	28	52	The terminology "era of climate responsibility" and "era of climate options" can be misleading and differ from normal usage. (IRELAND)
542	TS	28	48	0	0	Increased intensity, frequency, and duration of extreme events, as climate change becomes more extensive, means that adaptation based on recent experience or extrapolation of historical trends will be largely ineffective. [15.3.2.2] (Backus, George, Sandia National Laboratories)
543	TS	28	49	28	51	In chapter 21, to which these statements of the TS refer, it is not explicitly mentioned that 'uncertainties about future vulnerability and exposure also increase over time'. Reconsider giving another reference for these statements. Consider also adding Section 21.5.2 as a reference.\n\n (NETHERLANDS)
544	TS	29	10	29	11	More precisely the radiative forcing levels at 2100, not the whole 21st century. (Caesar, John, Met Office Hadley Centre)

#	Ch	From Page	From Line	To Page	To Line	Comment
545	TS	29	17	49	21	The information on sectors and regions in section C.i should be differentiated for different emission pathways, i.e. the decrease in risks for ambitious mitigation scenarios should be emphasized as this is most relevant for decision making. (GERMANY)
546	TS	29	17	49	21	The subsections on sectors and regions in section C.i would greatly profit from revising and clarifying the structure: 1) remove duplications, 2) separate climate change phenomena from its impacts, 3) separate human/social/economic and biophysical/natural systems, 4) separate risks from adaptation measures (e.g. the para on adaption on page 20, lines 20 to 32), 5) clarify the time period to which the statements relates. 6) reduce on the statements in each of subsections to subject (e.g. in "Terrestrial and inland water systems" the paras on moving ranges of plants and animal and on alien species should be moved to another section or the title must be changed to "Terrestrial systems and inland water systems"). Uncertainty needs to added to each key statement. (GERMANY)
547	TS	29	22	22	23	The statement needs more explanation, currently it suggests that uncertainty is uncontrollable and models unreliable. (GERMANY)
548	TS	29	29	18	23	The use of the term "emissions" is generally taken as a reference to products of fossil fuel combustion. However, releases of greenhouse gases from the environment itself are of extreme importance to climate forcing, including releases from peatlands, permafrost, coastal wetlands, etc. that are now a consequence of combined warming and sea level rise. Perhaps a better term than "emissions" can be used or clarification as to what is intended. (UNITED STATES OF AMERICA)
549	TS	29	36	29	38	The sentence is not very clear and should be rewitten to avoid misunderstandings. (Cristini, Luisa, University of Hawaii)
550	TS	30	0	0	0	General Comment. It is worth trying to get over the idea that glaciers act as saved freshwater capital. Perhaps here and in the policy summary as well. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
551	TS	30	3	30	14	In a seminal study on the Economics of Climate Adaptation (ECA), Swiss Re and other leading organizations developed a methodology to quantify local climate risks and provide decision-makers with the necessary facts to design a cost-effective climate adaptation strategy. ECA offers countries and local level decision-makers the facts and framework to design an adaptation strategy and to demonstrate the role of insurance risk transfer measures. Case studies in 17 different regions around the globe, ranging from Maharashtra in India to Florida and Northern England, showed that up to 68 percent of expected loss from climate change can be averted using cost-effective adaptation measures.\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)
552	TS	30	17	0	0	Please adjust the wording of heading C.i. to the heading C.i. in the SPM (GERMANY)
553	TS	30	17	49	22	A table joining all "specific regional examples" should replace the various lists of bullet points in Section C.i to improve readability. (GERMANY)
554	TS	30	19	0	0	The concept of the era of climate responsibility / option is not clear enough. It should be explained clearly when first mentioned on P 22, possibly in a box. See also our general comment on the concept of eras on the SPM and in Ch 1. (GERMANY)
555	TS	30	19	30	21	Where are the eras defined? What do they mean and what are their implications? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
556	TS	30	26	0	0	would change: the AR5 uses future tense for projections, please change. (GERMANY)
557	TS	30	26	30	26	Are there any assessment of changes to seasonality/precipitation in temperate regions? (UNITED STATES OF AMERICA)
558	TS	30	26	30	36	Why is the term "would" used here while not later in this section? This may imply that the other identified risks are more likely. (CANADA)
559	TS	30	29	0	0	And anywhere warm enough not to have any snow (Ingram, William, Met Office)

#	Ch	From Page	From Line	To Page	To Line	Comment
560	TS	30	30	30	31	An SRES figure? Why not current (i.e., use of RCPs) - can a similar figure be generated from more recent model results? This statement is in accordance with the AR4. What are the vulnerabilities? To social unrest? Irrigation? Residential consumption? (UNITED STATES OF AMERICA)
561	TS	30	30	38	43	Statement should be qualified to refer to non-antarctic glaciers/ice caps. (UNITED STATES OF AMERICA)
562	TS	30	30	52	52	Use of "renewable" as adjective is unnecessary and undefined. (UNITED STATES OF AMERICA)
563	TS	30	33	30	34	The emission of GHGs will affect climate firstly, then the precipitation and runoffs, then the water resource, during this process, there are uncertainties in each step, thus can not use the term "inference" as a causality. SUGGESTION: change as "Hydrological impacts of climate change would increase as global warming." (PAN, Jiahua, Chinese Academy of Social Sciences)
564	TS	30	33	30	36	Should this one be moved to the SPM? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
565	TS	30	33	30	36	These two sentences are not consistent. What does a low emissions pathway have to do with developing country vulnerabilities to water availability? This bias is also consistent with the rest of the text. High income countries will also be vulnerable, perhaps more so due to cost and willingness for adaptation. (UNITED STATES OF AMERICA)
566	TS	30	34	30	34	Suggest replacing the phrase " a low-emissions pathway reduces …." with "a low-emissions pathway could reduce". As the document acknowledges that there is limited evidence in support of the statements they should be made more conditional in nature. (CANADA)
567	TS	30	35	30	35	Suggest replacing the phrase " change on water resources are expected to reduce ...." with "change on water resources have the potential to reduce ....". As the document acknowledges that there is limited evidence in support of the statements they should be made more conditional in nature. (CANADA)
568	TS	30	52	0	0	renewable water resources? (GERMANY)
569	TS	30	54	30	54	Is this statement acceptable? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
570	TS	30	54	30	55	Very vague statement. Chapter 3, p. 20, l. 14 says that there is "...insufficient agreement of projections...", which is different from using different definitions. (NORWAY)
571	TS	31	1	31	4	It is sayed that there is an "High agreement robust evidence: projected climate changes imply large changes in the frequency of floods as a consequence of most intense rainfall events". It also says that it will mainly affect small catchments due to the limited extent of heavy rains. However, when more intense and local rainfall (usually convective rainfall), more uncertainty. On the contrary, the projected changes on heavy rainfall are more robust for extended events (and not so intense/heavy convective rainfalls), like those that affects great basins like Rhine or Danube. Another question here is why the report says than only "limited evidence" on the increase of economic impacts as a consequence of the major exposition and vulnerability to floods? All reports (included those of UNISDR) point to an increase of economic impacts due to the major exposition and vulnerability (included the major value of the assests); see for instance chapter 3, page 25, lines 38-51. (Llasat, Maria-Carmen, University of Barcelona)
572	TS	31	1	31	7	No changes in N. America? EU, Australia. Please specify. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
573	TS	31	1	31	7	The city of Hull, on England's North Sea coast, faces a three-pronged climate-induced threat. In addition to exposure to freshwater flooding following severe rainfall, Hull is at risk from the impact of strong windstorms and coastal flooding. The area is also economically deprived and currently under regeneration, which increases its vulnerability. Today's risk from coastal and river flood, as well as winterstorm amounts to US$ 50m. Analysis shows that even with only moderate climate change by 2030, the risk across all asset groups would increase by 10% compared with that scenario, and 20% in the case of major change. For example, the worst-case situation would incur an expected annual loss amounting to US$ 50m for residential buildings alone.\nhttp://media.swissre.com/documents/Economics_of_Climate_Adaption_UK_Factsheet1.pdf\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf#page=100 (Mueller, Lea, Swiss Reinsurance Company Ltd)
574	TS	31	9	31	13	Reference to the text should be changed from 3.5.2 to 3.5.2.3\n\n (NETHERLANDS)
575	TS	31	10	31	10	There is classic evidence from Gene Likens work on de-forestation on nutrient retention in catchments in upstate New York – done back in the 1960s. e.g. Likens, G.E., F.H. Bormann and N.M. Johnson. 1969. Nitrification: importance to nutrient losses from a cutover forested ecosystem. Science163:1205-1206. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
576	TS	31	18	31	18	However, BOD is likely to be higher under warm conditions in receiving waters from treatment plants. Extreme rainfall events will also lead to greater incidence of storm water discharge. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
577	TS	31	20	31	24	This paragraph is too vague and general. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
578	TS	31	27	31	29	This reference to global costs should be clarified. Costs for the water sector? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
579	TS	31	31	10	11	Deteriorating water quality applies not only to municipal water supplies but to all waters - where either concentrations of dissolved constituents or temperatures increase beyond normal tolerances of aquatic species. In addition, increased water temperature has already resulted in derating or temporary halts in thermoelectric power production in the central/southern US. (UNITED STATES OF AMERICA)
580	TS	31	38	31	38	Fragile is a rather judgemental term. Perhaps just delete. (UNITED STATES OF AMERICA)
581	TS	31	39	31	39	Since basically all life on Earth is water dependent, maybe "water constrained" is a better wording for areas with low water availability for organisms. (NORWAY)
582	TS	31	44	31	44	What is it about water quality and high temperature that will be affected? Demand? Increased ET? Sedimentation? Other? (UNITED STATES OF AMERICA)
583	TS	31	44	31	45	This statement (on Europe) seems a bit of a blanket statement (too vague) and poorly justified compared to the other examples (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
584	TS	31	46	31	54	As a reference for the main statement in lines 46-47 section 24.4.3 is mentioned. We doubt whether this reference is adequate. Section 24.4.3 refers to coastal systems and low-lying areas, and not directly to freshwater resources (section 24.4.1). Moreover the term 'water scarcity' is mentioned at page 25, line 33 (in section 24.4.4.3), page 31, line 20 (in section 24.4.5.3) and in FAQ 24.1 (page 49, line 50 and 53). Please reconsider refering to another section then 24.4.3.\n\n (NETHERLANDS)
585	TS	31	55	32	6	Evidence in Chapter is for increases and decreases in freshwater resources in NZ; TS cites only decreases\n\n (NETHERLANDS)
586	TS	31	55	32	6	SPM states eastern and northern parts of NZ; Chapter states east and north of North Island\n\n (NETHERLANDS)
587	TS	32	7	32	24	These are nice examples but are in conflict with previous statements. (Page 31, line 7) (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
588	TS	32	13	32	13	The broad term of invasive is probably not applicable. Need to explore what is truly an invasive versus expanded range of existing species that are not necessarily desireable (by people). (UNITED STATES OF AMERICA)
589	TS	32	14	15	32	Ecuador as well as Chile and Argentina has semi-arid zones with high vulnerability in terms of water supply. (Galarza, Maria Jose, Ministerio del Ambiente del Ecuador)
590	TS	32	21	32	24	The water law has not been updated yet in Ecuador. (Galarza, Maria Jose, Ministerio del Ambiente del Ecuador)
591	TS	32	22	32	22	What role is this "actor"? Residents? Communities? (UNITED STATES OF AMERICA)
592	TS	32	23	32	23	What happens when species migrate to mountain tops or limits to habitat? (UNITED STATES OF AMERICA)
593	TS	32	37	32	37	Do the authors mean lagged response times? (UNITED STATES OF AMERICA)
594	TS	32	44	32	45	What about surface roughness? (UNITED STATES OF AMERICA)
595	TS	32	44	32	45	Include changes related to carbon storage, through e.g. deforestration and destruction of wetlands, in this list of climate feedbacks (NORWAY)
596	TS	32	45	32	46	What about teleconnections? (UNITED STATES OF AMERICA)
597	TS	32	53	33	2	Is there a chance that land use change or management practices might also contribute? Perhaps even more so than climate? (UNITED STATES OF AMERICA)
598	TS	33	4	33	4	A species will not move its range, nor alter its abundance, nor shift seasonal activities. (See comments for Policy Makers Summary). This implies a conscious decision by the species. Individuals and populations in species respond to environmental change resulting in shifts in distribution, changes in abundance, phenology etc. Rephrase “In terrestrial plant and animal species, ranges will continue to move, abundance will alter and there will be shifts in seasonal patterns of activities in response to…..” (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
599	TS	33	4	33	31	The para starting in line 4 and the one starting in line 18 seem to be closely linked, it is suggest to join and shorten them. (GERMANY)
600	TS	33	5	0	0	Consider adding (phenology) after 'activities' (Donnelly, Alison, Trinity College Dublin)
601	TS	33	13	33	14	Please add one sentence on why are invasisve species more likely than native species to have attributes favouring survival and reprodction under climate change (Cristini, Luisa, University of Hawaii)
602	TS	33	14	33	14	Insert “and more variable” to give “changing and more variable” (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
603	TS	33	18	33	31	Please add to the paragraph that there is a great interspecific variability in phenological responses to climate change, leading to changes in interspecific interactions and to increased asynchrony (see chapter 4, page 24 lines 18-42 and chapter 23.6.4.). Even if species would be able to move fast enough to reach suitable climates, changed species interactions poses an additional threat on them. (GERMANY)
604	TS	33	22	33	23	Mountains have often been reported as particularly vulnerable because they are limited territories, migration is upwards (physical limit to mountain peaks) and competence and other ecological relations can make ecosystems non-viable. Flat areas are usually easier to migrate. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
605	TS	33	22	33	23	The text states "Species in large flat areas are particularly vulnerable because they must migrate over longer distances to keep up with climate change than will species in mountainous regions." Please add: "An important exception is for species that are already at the tops of mountains (or near other boundaries) - they are among the most threatened by climate change because they cannot move upwards." (citation from chapter 4, page 30, lines 4 -5) (GERMANY)
606	TS	33	23	33	24	Amphibians, reptiles should be mentioned. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
607	TS	33	24	33	24	Perhaps amphibians and reptiles as well? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)

#	Ch	From Page	From Line	To Page	To Line	Comment
608	TS	33	34	33	50	This figure is very crowded and difficult to read. Perhaps the 3 panels (a-c) could be separated a little more. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
609	TS	33	52	33	54	To which time does this statement refer and to which RCP? (GERMANY)
610	TS	33	52	33	54	Consider to include a summary of this finding in the in SPM. (NORWAY)
611	TS	34	4	34	12	Perhaps it is worth emphasizing that extensive local extinctions are likely to occur ahead of global extinction for a particular species. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
612	TS	34	14	0	0	For traceability, it would be good to see in this section a reference to other sections in the document supporting the claim of "virtual certainty" that carbon stored in land and freshwater has increased over last two decades in plant biomass and SOM. It is rare that the document uses "virtual certainty" and it would seem that SOM sampling is uncertain enough that context is needed in referenced sections. (CANADA)
613	TS	34	14	34	16	Please check for consistency between this sentence and the sentence in TS, p. 34, l. 23-25. (NORWAY)
614	TS	34	17	34	18	A study of the Institute of Hydrology Meteorology and Environmental Studies of Colombia, that contributes with this statement is: Yepes, A., Duque, A.J., Navarrete D.A., Phillips J.F., Cabrera, E., Corrales-Osorio A., Alvarez-Davila E., Galindo G., García-davila M. C., Idarraga A., Vargas- D. M. (2011). Estimación de las reservas y pérdida de carbono por deforestación en el periodo 2000-2007 en los bosques del departamento de Antioquia, Colombia". Actual Biol 33 (95): 193-208. (COLOMBIA)
615	TS	34	31	34	34	The authors are cautioned to approach this statement carefully. Models are important surrogates and can provide insight into processes, but they are not definitive. Just because models state that N will be a limiting factor doesn't mean that other factors (e.g., P, the N-H2O, disturbance rates, etc) aren't equally as important. Please clarify. (UNITED STATES OF AMERICA)
616	TS	34	34	14	34	An additional factor that moves carbon from terrestrial systems back to atmosphere that is not discussed is that due to simple change in permafrost conditions, and resulting increase in natural microbial metabolism as well as melting of clathrates. (UNITED STATES OF AMERICA)
617	TS	34	34	54	54	The "low confidence" is misattributed as written: the release of greenhouse gases from thawing permafrost and burning forests is "high confidence"; what may be "low confidence" is whether this constitutes a tipping point. Suggest that this be checked also in the underpinning chapter. (UNITED STATES OF AMERICA)
618	TS	34	36	34	38	Have there been no results since AR4 on this topic? (UNITED STATES OF AMERICA)
619	TS	34	36	34	41	The sentences in this paragraph seem to be exaggerated in terms of the impact of climate change on tree sensitivity.\nYou have referred the section 4.3.3.1 to show how trees are more sensitive to futre climate change than reported in IPCC AR4; however, the section 4.3.3.1 does not necessarily compared with the information in the AR4. Also most of the tree mortality are caused by drought, not temperature rise. Also in the second sentence, you've said high conficence that future climate change impacts on tree mortality and tree ranges could be large; however, there are not many papers directly showed tree mortality is caused by climate change: most papers discussed tree mortality is caused by combinations of varous factors such as drought and insect attack, etc. Therefore it may be better to lower the degree of your confidence from "high" to "medium". (Matsui, Tetsuya, Forestry and Forest Products Research Institute)

#	Ch	From Page	From Line	To Page	To Line	Comment
620	TS	34	36	34	41	The first sentence, "Recent experimental, observational ... much sooner than previously anticipated. [4.3.3.1]", does not seem to have sufficient backing elaboration in the indicated section 4.3.3.1, particularly for the comparison made with the assessment by IPCC AR4, therefore it is strongly suggested to deleted the sentence. Also, for the second sentence, "Future climate change impacts on tree mortality and tree ranges could be large (high confidence), ...", the stated level of "high" confidence here is suggested to be lowered since the section 4.3.3 points out that tree mortality and tree ranges are driven by various factors; i.e. direct attribution of tree mortality and tree ranges to climate change is not necessarily clear. (JAPAN)
621	TS	34	36	34	45	Increasing disease risk as pathogens spread with warming? Worth mentioning? (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
622	TS	34	47	34	49	There will be changes to carbon emissions, though not always increases. Rapid woody encroachment can decrease carbon emissions, no-till agricultural practices can decrease carbon emissions, afforestation can decrease emissions, etc. (UNITED STATES OF AMERICA)
623	TS	35	10	35	10	Management can shape, not always reduce….. (UNITED STATES OF AMERICA)
624	TS	35	12	35	13	Species cannot lose "species", please considering using "individuals" or "populations". (NORWAY)
625	TS	35	15	35	20	very long sentence – split? “The capacity for ecosystems to adapt to climate change can be increased by reducing the other stresses operating on them: reducing the rate and magnitude of change, reducing habitat fragmentation and increasing connectivity, maintaining a large pool of genetic diversity and functional evolutionary processes. In addition active management can occur via assisted translocation of slow….”. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
626	TS	35	17	35	18	Since assisted translocation is highly debatable because of possible unforeseeable negative consequences (see chapter 4.4.2.4.) it should either not be listed in this paragraph (proposal to delete the term here) or should be only mentioned with a qualifier e.g. in exceptional cases. (GERMANY)
627	TS	35	22	0	0	Consider regional balance of case studies (add African example) (Sönke, Kreft, United Nations University - Institute for Environmental and Human Security)
628	TS	35	22	36	13	Only one Asian example from Central Asia has been provided as a Sectoral Risk with Regional Examples (freshwater systems), which is insufficient to represent the vast diversity of the Asian continent. Examples in each region should be added. (JAPAN)
629	TS	35	25	35	25	Not sure what the authors mean by phenological mismatch. Perhaps shifts (in seasonality, etc) in attempts to coincide with new growing season, etc? What time scales does this occur on? Suspect that this is will differ among organisms (e.g., microbe versus a tree). (UNITED STATES OF AMERICA)
630	TS	35	27	35	28	Either state the specific phenomenon (what species is moving where), or generalize that undersireable natives are increasing range, or habitat. Is it really invasives? If so, what are they replacing, etc? (UNITED STATES OF AMERICA)
631	TS	35	28	35	30	This statement is very unclear. Natura 2000 provides plenty of opportunities for adaptation given its significant surface area covered. Other measures are included in the Habitats Directive to facilitate connectivity. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
632	TS	35	28	35	30	The text states "Biodiversity is affected in unprotected areas more than in protected areas, but Natura 2000 areas retain climate suitability for species no better and sometimes less effectively than unprotected areas." Comments: 1) This sentence is an incorrect citation of the summary of the original paper from Araujo 2011: whereas in the original paper the sentence is formulated as a statement about the future ("Protected areas ARE EXPECTED to retain climatic suitability for species better than unprotected areas, but Natura 2000 retain climate suitability for species no better and sometimes less effectively than unprotected areas.") because the paper deals with projections until 2080, the given sentence in the TS is a statement about the presence "Biodiversity IS AFFECTED...". 2) In the analysis of Araujo a distiction is made between protected areas, unprotected areas and NATURA 2000 areas. This is not explicitly mentioned in the TS nor chapter 23 and may lead to confusion. 3) One key finding is based on data of plants ("in fact, the Natura 2000 is less effective in retaining suitable climate for plant species than sets of randomly selected unprotected areas") but data of birds show different results ("For half of the remaining combinations of taxonomic groups and scenarios, the Natura 2000 provides no better buffer against climate change than areas outside the network, with the exception of birds"). 4) In Araujo's paper some explanations are given for differences in changes of climate suitability between protected areas and Natura 2000: "Differences in changes of climate suitability between protected areas and Natura 2000 are partly related with topography. Most protected areas are in mountains or rugged environments. The Natura 2000 also prioritizes farmlands and these are located in lower and flatter lands. Because proportional range losses arising from climate change are usually more pronounced in flatlands than in rugged terrains, the Natura 2000 is more vulnerable to climate change." Suggestion: Since the given sentence in the TS is a coarse reduction of findings and explanations of the original paper and may lead to misinterpretations, we propose to delete the sentence here. (GERMANY)
633	TS	35	28	35	30	Since the sentence in the TS (and in Ch 23, P 5 L 23-25) is a coarse reduction of findings and explanations of the original paper and may lead to misinterpretations, we propose to delete the sentence here and to replace it with the following original quotation from Araujo's paper: "Protected areas are expected to retain climatic suitability for species better than unprotected areas." (GERMANY)
634	TS	35	33	35	33	Not just climate, but management will alter damage to forests,.....fire suppression is a substantial factor. This is also major concern for North America, not just Europe. (UNITED STATES OF AMERICA)
635	TS	35	40	35	49	The sentence "permafrost degradation during the 21st Century" is repeated in one paragraph. One of them should be deleted. (JAPAN)
636	TS	35	47	35	48	This statement is not clear. Please revise. (UNITED STATES OF AMERICA)
637	TS	35	51	35	56	It is confusing to apply confidence statements to compound / multi-clause statements. Does it apply to the whole sentence, or the last part, or…?\n\n (NETHERLANDS)
638	TS	35	52	35	54	Much of Australia's native forest has been lost to slash pine production or conversion to rangelands. (UNITED STATES OF AMERICA)
639	TS	35	55	35	56	Reference to endemic species extinction. Original text states local species extinction, which we don't consider the same thing as endemic species.\n\n (NETHERLANDS)
640	TS	35	55	35	56	Please provide specifics. Australia is an outstanding example of true invasives (rabbits, fox, horse, etc.) displacing native species. (UNITED STATES OF AMERICA)
641	TS	36	0	0	0	Nice section on coasts. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
642	TS	36	5	36	6	This statement is weak. Consider also Deser et al., regarding changes to regions. What are projected changes other than mean temperature? What will or could be affected? Would have expected inclusion of chages in rain-on-snow in mountain regions, decreasing water availability, changes to flood patterns, extreme events, etc. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
643	TS	36	18	36	25	Proposal to add this paragraph to SPM (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
644	TS	36	27	36	42	Chapter 30.6 should be added to the source\n\n (NETHERLANDS)
645	TS	36	28	36	29	Line number 28 states: 'The increase in acidity will be higher in areas where eutrophication is an issue'. From Chapter 5 (p.12, line 39 onward), eutrophication causes hypoxia and this has negative consequences for some organisms, but, in Chapter 5 at least, it is not stated that eutrophication exacerbates acidification. After a check with a chemist, the statement is correct. However it is not yet clearly stated in the chapter text. Suggestion: Crossrefer or state that 'hypoxia can exacerbate acidification since acid producing (anaerobe) organisms thrive in these environments'. \n\n (NETHERLANDS)
646	TS	36	29	36	29	„Due to relative sea level rise…": The term „relative" is misleading; it could also mean that SL is rising due to land depression which is not a climatic effect. What is meant here, is the total net rise due to freshwater discharge into the ocean plus thermosteric. (GERMANY)
647	TS	36	33	36	34	Why would kelp and seagrasses not expand elsewhere? i.e. Why assume a decline? Also, they would probably be benefited by ocean acidification (mentioned elsewhere in the report) (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
648	TS	36	36	18	19	Suggest broadening this sentence to include coastal erosion and sedimentation in addition to submergence and flooding. This is consistent with Chapter 5 material on coastal erosion. For example: "Due to relative sea-level rise, coastal systems and low-lying areas will increasingly experience adverse impacts associated with coastal erosion and sedimentation, submergence, and flooding from extreme coastal high water levels (high confidence)." The paragraph could also be expanded by a sentence or two to include examples, such as a) up to 3/4 of world coastline is rocky or cliffed (Ch 5 P15/L38) and/or b) Ch 5 P43/L37-39 demonstrates that coastal response is the product of complex drivers and processes beyond simple submergence. (UNITED STATES OF AMERICA)
649	TS	36	36	18	25	Increased coastal inundation that is already observed is not just related to RSLR and surge....but is itself increasingly related to increased precipitation associated with coastal meteorological extreme events\neven in areas where RSLR is less of a concern (non erosive etc). (UNITED STATES OF AMERICA)
650	TS	36	36	25	25	Change "5.3.1" to "5.3.2.4." (UNITED STATES OF AMERICA)
651	TS	36	36	28	29	It's not just eutrophication from land - but also upwelled waters tend to have lower pH - would be worth including mention of this here. (UNITED STATES OF AMERICA)
652	TS	36	36	36	36	Replace "intertidal" with "littoral". The Mediterranean is an essentially tideless sea. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
653	TS	36	36	39	39	A statement that further explains the ability of beaches and dunes to migrate landward at moderate rates of sea level rise (e.g. FAQ 5.2) would be a meaningful addition to the simple statement about erosion continuing. (UNITED STATES OF AMERICA)
654	TS	36	36	42	42	Reference to section 30.5.6 on sub-tropical gyres should be removed from this section as it is not relevant to the discussion of coastal ecosystems. Reference to 30.5.4 on coastal boundary systems should be added to the list of sections referenced. (UNITED STATES OF AMERICA)
655	TS	36	36	49	49	Is this supposed to say "increased runoff" (not "reduced")? If not, might be better to say "changes in freshwater input." (UNITED STATES OF AMERICA)
656	TS	36	44	36	50	This paragraph is on changes in exposition, please explain the link to climate change and its influence on risk? (Are sea level rise and changes in climate conditions irrelevant until 2050?) (GERMANY)
657	TS	36	44	36	50	Are there projected changes to other topics, e.g., to 100 year flood events? (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
658	TS	36	52	36	52	Losses from floods, storms, earthquakes and other natural catastrophes (Nat Cat) impact the economies of entire countries and are therefore a key driver of the re/insurance business. Such losses are becoming more frequent and severe due to higher insurance penetration and the concentration of assets in exposed areas as well as climate change. If unmitigated, climate change could cost the world economy around 20% of global GDP by the end of this century.\nhttp://media.swissre.com/documents/Top_Topics_Group_Issue_Management_2013.pdf#page=6 (Mueller, Lea, Swiss Reinsurance Company Ltd)
659	TS	36	52	37	4	We found the 1.26 m sea-level rise in 2100 very difficult to “fact-check” back to WGI. In WGII (Ch5) the number (1.26 m rise in 2100) is indeed mentioned in a couple of instances as a very extreme scenario (as far as I can see the effect of ground subsidence must have been taken into account). In contrast, in WGI (Table 13.5, Ch13), none of the scenarios produce a rise anywhere close to 1.26 m by 2100, even with the already considerably large uncertainty estimates provided. This suggests a very large contribution coming from the ground subsidence. Without further evidence, public critique could be expected that the 1.26 m rise is ‘alarmistically’ high given the model output. But maybe we overlooked something here.\n\n (NETHERLANDS)
660	TS	37	13	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
661	TS	37	13	37	51	Suggest including examples in N.America, e.g., Sandy, Katrina, loss of barrier islands, buffer ecosystems, extreme drought. (UNITED STATES OF AMERICA)
662	TS	37	14	37	51	More evidence-based regional examples from the Pacific island countries would be recommended (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
663	TS	37	23	0	0	Mention ECA Hull flood risk: http://media.swissre.com/documents/Economics_of_Climate_Adaption_UK_Factsheet1.pdf\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf#page=100 (Mueller, Lea, Swiss Reinsurance Company Ltd)
664	TS	37	36	37	37	A misinterpretation of text: the original text says evidence is limited about the ability of reefs to respond to CC, but the claim here is that a reef's ability to respond is limited. \n\n (NETHERLANDS)
665	TS	37	37	11	11	Change “5.4.3” to “5.4.3.1”. (UNITED STATES OF AMERICA)
666	TS	37	45	37	48	This has nothing to do with projections. Furthermore, examples are usually linked to regions, not specific countries. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
667	TS	37	45	37	48	For the statement on Brazil, it is not clear how the activities relate to climate change? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
668	TS	37	49	37	49	Please consider including "…and other ice dependent arctic marine mammals…" after "polar bears", since for example many arctic seals are dependent on ice for giving birth and lactating pups (which is a reason for polar bears to hunt there). (NORWAY)
669	TS	37	51	0	0	Small islands development states experience four types of flooding: flash floods, river floods, coastal floods and ponding floods. The island of Samoa, for example, has his-torically suffered coastal flooding. In 2008, it was estimated that the associated annual average losses could be up to US$25 million\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf#page=110 (Mueller, Lea, Swiss Reinsurance Company Ltd)
670	TS	38	9	38	16	Should add Box CC-CR as a source\n\n (NETHERLANDS)
671	TS	38	24	38	28	Please be more specific on AR5 WGI reference. What about fish catch at around 10% NPP? (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
672	TS	38	38	16	16	This section makes reference to Box 6-2. However, there is no box 6-2 in Chapter 6 of the WGII document. (UNITED STATES OF AMERICA)
673	TS	38	43	38	49	The figure is ok but the panels are too crowded and laid out in a very ugly and confusing way. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
674	TS	38	54	38	54	Delete “fisheries” “and is” replace with key “high value exploited species, are”. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
675	TS	39	4	39	5	Sentence doesn't make sense grammatically and should be re-written (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
676	TS	39	4	39	14	These statements were also sourced from Chapter 30.6.2, Chapter 30.6.6, and Chapter 30.6.7.\n\n (NETHERLANDS)
677	TS	39	5	39	5	the term "fish stocks" should be substituted by "some fish species" so as to better reflect the content of chapter 7.\n\n (NETHERLANDS)
678	TS	39	6	39	6	Ecosystem-based management needs to be in the glossary (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
679	TS	39	16	39	19	Chapter 30.6.6 should be added as the source as well\n\n (NETHERLANDS)
680	TS	39	16	39	19	Would have expected that lack of sanitiation would be the primary threat. (UNITED STATES OF AMERICA)
681	TS	39	21	39	32	More evidence-based results from the Pacific island regions regarding influencing ocean mixing sea-levels and primary productivity. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
682	TS	39	21	39	32	Chapter 30.6.6 and Figure 30-15 should be added as the source as well\n\n (NETHERLANDS)
683	TS	39	36	39	36	Storms are not influenced by SLR, but could be enhanced by climate change. The sentence, however suggests a relation between SLR and the impacts of storm surges, which is not correct, please clarify. (GERMANY)
684	TS	39	42	39	42	The text deals with coasts. Therefore "sub-regions" should be replaced by "coastal regions". (GERMANY)
685	TS	39	42	39	48	Ocean ecosystems and associated subregions should include examples from the Pacific island countries in particular blue carbon related references (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
686	TS	39	42	39	48	Chapter 30.7 is not the appropriate source of these statements. Instead, Chapter 30.6.4 is more suitable.\n\n (NETHERLANDS)
687	TS	39	44	39	44	Is "strategies" the best word to use in this context? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
688	TS	39	46	83	48	It is unclear whether this sentence is dealing with the sequestration of CO2 as such (liquid or solid), of other forms of carbon e.g. dissolved inorganic carbon or both. The different forms of carbon will have very different effects so this sentence needs to be clear what it is dealing with. (Vivian, Chris, IMAREST)
689	TS	39	50	39	52	We believe that this statement could be misunderstood since it may be confused with storage in geological reservoirs under the seabed which is not geoengineering in this report (see Glossary). Therefore we propose to add after deep ocean: "above the seafl (NORWAY)
690	TS	39	50	39	54	The section on geoengineering is too brief. More detail is needed here on the different geoengineering options and possible consequences in the context of climate change. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
691	TS	39	50	39	54	This para mentions the risks from geoengineering techniques in the context of other risks for the marine environment. These other risks result from impacts that are very likely to occur with increasing temperature, such as ocean acidification and warming, or sea level rise. Geoengineering, in contrast, is a cause for risk that might never be put into practise as these techniques are not available yet, and might never be. This fact should be explicetely stated in the para, and the conditional clause should be used for all statements. \n\nIn addition, it is not balanced to highlight ocean fertilisation in the TS with regard to ocean acidification, because other geoengineering techniques (both CDR/SRM) would also have highly negative effects on the ocean. In addition, please explain the expression ""environmental footprint"" as it is downplaying the risks. In addition, geoengineering will ""not only"" have environmental footprints, but even more socio-economic consequences. The ""purposeful alteration"" is associated with high risks. Please mention these aspects here. (GERMANY)
692	TS	39	53	0	54	solar radiation management is a contested term as it implies that radiative forcing can be "managed" intentionally and with precision. This is far from certain. The first time the term is used, it would be appropriate to include a preceding qualifier such as "so-called" or to place quotation marks around the term. In addition, Williamson and Turley (2012) raise the possibility that SRM focusing on sulphates could actually worsen ocean acidification (OA). While it is true that SRM will not stop OA, and the text currently reflects this, we suggest the following wording: "Alternative methods to ameliorate climate change such as those focusing on so-called solar radiation management will not abate ocean acidification, and, in some cases, could increase it (Williamson and Turley, 2012)." (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
693	TS	39	53	39	54	“SRM leave ocean acidification unabated…” See the comment to (Chapter 5, Page 50, Lines 26-28). (Ryaboshapko, Alexey, Institute of Global Climate and Ecology)
694	TS	39	53	39	54	This sentence describes another geoengineering method not an "alternative" method to geoegineering. Furthermore we believe the text should mention the issue of a sudden cessation of SRM. Therefore we propose the following change: "Other geoengineering met (NORWAY)
695	TS	40	1	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
696	TS	40	1	40	11	Regional specific examples should include Pacific island examples. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
697	TS	40	1	40	11	Is this section in the wrong place? They don't follow on from the previous paragraph on geoengineering. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
698	TS	40	1	40	11	Is there nothing on changes in monsoon, either for Asia or North America? (UNITED STATES OF AMERICA)
699	TS	40	2	40	3	Please remove "in some parts of Europe (e.g. the Bay of Biscay)" as it makes it sound very parochial and is probably true of the region as a whole. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
700	TS	40	2	40	5	This statement about Europe should be carefully checked. It is important and can send confusing messages. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
701	TS	40	3	40	4	I question the general validity of this statement, even if restricted to Europe: "Climate Change will not entail relocation of fishing fleets (high confidence)" (Ottersen, Geir, Institute of Marine Research)
702	TS	40	4	40	4	I strongly disagree that climate change will not entail "relocation of fishing fleets" as this would be very context specific and in certain parts of Europe we are seeing some changes in fleet behaviour/location to make the most of new opportunities (e.g. in the UK). Perhaps "not necessarily entail relocation" would be better. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
703	TS	40	4	40	5	The frequency of harmful algal blooms will not necessarily increase across the whole of Europe. Some species prefer cooler conditions (e.g. Karenia) and may decline in the south, whereas others would increase. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
704	TS	40	5	0	0	Please check consistency of the terms "algal blooms" as used here and "cyanobacterial blooms" as used in chapter 23 (Ch. 23, P 4, l.50). (GERMANY)
705	TS	40	6	40	7	This sentence mentions a ' decreased abundance of high latitude marine organisms'. This statement is somewhat ambigious: "high latitude marine organisms" can both refer to the current species that live at high latitudes (which we believe is meant here), or any species that happen to live at high latitudes. \n\n (NETHERLANDS)
706	TS	40	9	0	0	Please insert confidence level: "…to food webs (medium confidence)". (Ch. 28, P3, l. 33-34) (GERMANY)
707	TS	40	11	0	0	Please insert confidence level: "…to marine ecosystems (medium confidence)". (Ch. 28, P3, l. 19) (GERMANY)
708	TS	40	14	40	14	Perhaps clarify that this is for land systems. (UNITED STATES OF AMERICA)
709	TS	40	14	42	16	The impacts of pests and pest control on food production systems and food security are somewhat understated in summary. To my opinion increased risks of crop losses, poor crop quality and mycotoxins sue to pests shuould be mentioned here. Also the risks of increased pesticide use to increased pesticide residues and increased environmental hazards should be somehow commented in summary. (Hannukkala, Asko, MTT Agrifood Research Finland)
710	TS	40	16	0	0	Clarify meaning of 'up to 2 deg C'. Does it many any small amount of warming reduces yield potential in this region. Unlikey. And you do not mean' temperate' do you, but 'mid and mid-high latitude'. Or are you specificsally excluding continental mid latitude. Can solve the former issue by separating our a) altered yield potential from b) likley changes in output after adaptation. (Parry, Martin, Imperial College)
711	TS	40	16	40	19	Does this also include changes to water demand? Irrigation and water for energy production will also be compromised. (UNITED STATES OF AMERICA)
712	TS	40	16	40	22	There are estimates on impacts on cereal production, what about other crops e.g. potato that is becoming increasingly important crop in many parts of the world? (Hannukkala, Asko, MTT Agrifood Research Finland)
713	TS	40	17	40	17	Inclusion of rice in this list of species that are likely negatively affected by climate change is puzzling considering the following sentence in the main text: "There is also medium confidence that effects on rice and soybean yields have been small in major production regions and globally. (Chapter 7, page 7, lines 21-23). It is advisable to resolve this inconsistency.\n\n (NETHERLANDS)
714	TS	40	17	40	18	“Many individual locations” seems not to align with the main text which would support “some individual locations" , or even “individual locations” better.\n\n (NETHERLANDS)
715	TS	40	19	40	19	yields: it is ambiguous to which yields this term refers. Is this yields in the tropics in general, or does it refer to cereal yields as in the previous sentence. Clarification is needed.\n\n (NETHERLANDS)
716	TS	40	19	40	20	Reductions ... century. It is unclear what reductions this refers to. Is this a general pattern, globally and over all crops? If yes, say so explicitly. If this concerns examples of some particularly badly affected systems, clarify so no misunderstanding to the generalisability of this claim arises. \n\n (NETHERLANDS)
717	TS	40	19	40	22	Reductions ... evidence). This sentences leans heavily on, and is in fact almost, a copy of the coverage in Chapter 7 of the study of Challinor et al. (2013). Although Challinor is on of the leading author of Chapter 7, this study is not yet accessible to the scientific community, and according to the bibliography, has not yet passed peer review. It seems appropriate for such a wide ranging and important statement in the SPM to be more widely supported by publicly accessible data, particularly with the labelling, high agreement robust evidence.\n\n (NETHERLANDS)
718	TS	40	24	0	0	The word 'competiveness' may be correctly spelled as 'competitiveness'. (Iqbal, Muhammad Mohsin, Global Change Impact Studies Centre)
719	TS	40	24	40	25	The confidence level here associated with the statement that climate change will increase the competitiveness of weeds seems at odd with remarks on page 17 of chapter 7, lines 47-50 suggesting CO2 to increase typical crop competitivity compared to many weeds (generally C4-plants). Suggestion: lower evidence and agreement. \n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
720	TS	40	44	40	44	Figure TS.10 is not a regional figure. (UNITED STATES OF AMERICA)
721	TS	40	47	40	49	The statement about urban food adaptation mentions factors that are applicable to food adaptation in general and not specific or very important for urban areas. In chapter 8, there is discussion about specific adaptive local responses for urban areas such as strengthening local markets, per-urban agriculture etc (see page 40, line 24 to 32). These should be included in the statement. \n\n (NETHERLANDS)
722	TS	41	1	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
723	TS	41	1	42	16	Only one Asian example from Central Asia has been provided as a Sectoral Risk with Regional Examples (marine systems). Considering the importance of Asia, in terms of its dominating the global production of food from both capture fisheries and aquaculture, more examples should be introduced from Asia. Suggested additions are: "Sea-level rise is expected to impact both capture fisheries and aquaculture production in river deltas." (Chapter 24 page 27 lines 14-15); "For marine capture fisheries, Cheung et al (2009, 2010) suggest that climate change may lead to a massive redistribution of fisheries catch potential, with large increases in high-latitude regions, including Asian Russia, and large declines in the tropics, particularly Indonesia." (Chapter 24 page 27 lines 15-19) (JAPAN)
724	TS	41	2	41	11	For example, Mali is considered at risk of a 'climate zone shift', owing to the Sahara moving south. Because of changes in climate, in 2030, the annual value of crop and livestock production is likely to drop between 5 percent and 15 percent.\nhttp://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf#page=86 (Mueller, Lea, Swiss Reinsurance Company Ltd)
725	TS	41	12	41	19	This paragraph conflicts with previous text that EU will increase productivity (UNITED STATES OF AMERICA)
726	TS	41	39	41	39	Longer growing season will increase ET, increasing water demand. (UNITED STATES OF AMERICA)
727	TS	41	46	41	52	Chapter bolds and underlines "if" from "if scenarios of severe drying"; TS does not.\n\n (NETHERLANDS)
728	TS	41	46	41	52	The Murray Darling is also a very complex system - intense withdrawals for irrigation, combined with drought have increased salinization. Another example of human activities interesecting with climate (UNITED STATES OF AMERICA)
729	TS	41	47	41	49	Reference to "food production" seems a little alarmist because we can only find reference to the effects of water availability on "agriculture production" which includes animal and human food production, fibre, biofuel production, etc. \n\n (NETHERLANDS)
730	TS	41	49	41	51	The report states "More efficient water use, allocation, planning and trading would increase the resilience of systems in the near term but cannot prevent significant reductions in agricultural production and severe consequences for ecosystems and some rural communities at the dry end of the projected range." \n\nSuggest replacing this with "More efficient water use, allocation, and trading are expected to increase the resilience of systems, but at the dry end of the projected range they cannot prevent significant reductions in agricultural production and severe consequences for ecosystems and some rural communities." (AUSTRALIA)
731	TS	42	10	42	12	In the main chapter, the fact is mentioned only for SA not for CA and SA\n\n (NETHERLANDS)
732	TS	42	10	42	12	Very important observation but true for all regions of the world, please consider including a statement that would encompass other regions. (NORWAY)
733	TS	42	13	42	14	Insert 'the' before 'climate'. This sentence is a bit hard to understand, so a slight rephrasing would be advised\n\n (NETHERLANDS)
734	TS	42	16	0	0	Please insert confidence level: "…mammals (high confidence)". (Ch. 28, P5, l.1). (GERMANY)
735	TS	42	19	42	46	The urban section does not mention air quality at all. Please include a brief discussion. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)

#	Ch	From Page	From Line	To Page	To Line	Comment
736	TS	42	21	42	27	Increasing populations, assets and economic activities in urban areas, has been documented by UN Habitat in different parts the world, particularly Bangladesh, India, Pakistan, and parts of the Pacific (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
737	TS	42	29	42	37	Are there any examples of current strategies, e.g., green roofs, etc? (UNITED STATES OF AMERICA)
738	TS	42	37	42	37	Please add at the end of the para: "As the existing settlements represent large investments of the past into buildings and infrastructures which can't be given up without considerable financial losses, it is of utmost importance to find intelligent strategies and not too expensive measures to adapt as many existing settlements to climate change as possible. In general it might be easier to adapt settlements to rising temperatures than to rising flood risks. In addition, before using valuable Greenfield sites for climate adaptation, the use of existing Brownfield sites, which often have infrastructure available, is to be studied." (see similar comment Chapter 8,P38, l10) (GERMANY)
739	TS	43	11	43	17	Since this paragraph points out "global food supply security" it seems to be opportune mentioning food security which is developed in Chapter 7 specifically 7.2..2 and 7.3.3 or related subsections, possibly with a short phrase to make a link.\n\n (NETHERLANDS)
740	TS	43	19	43	24	Are there no impacts on Russia or the US? (UNITED STATES OF AMERICA)
741	TS	43	26	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
742	TS	43	26	43	28	Only one example from Asia has been provided as a Sectoral Risk with Regional Examples (rural systems). More examples may be derived from Chapter 9 (9.3.3.1) to cover all regions. Given the importance of water availability as discussed throughout the report, a suggested addition is: "Climate change is expected to impact water resources, and thus the viability of agricultural livelihoods in the Asian region in a major way. Diminishing Himalayan glaciers would impact the agricultural water supply and food security of more than one billion people in Asia." (Chapter 9 page 9 lines 48 to page10 line 3) (JAPAN)
743	TS	43	26	43	28	Please consider including some examples for Africa and Central and South America. (NORWAY)
744	TS	43	27	43	28	As specific regional examples, a little more detailed description on this general statement would be expected. Please give some examples of parts of Asia where these phenomena are expected. \n\n (NETHERLANDS)
745	TS	43	27	43	28	This could be strengthened by including flood and drought impact on livestock production, sanitation, etc. (UNITED STATES OF AMERICA)
746	TS	43	31	45	36	This section is critical and should be further developed. What about industry? Insurance? Etc. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
747	TS	43	33	43	41	Suggest adding treatment of increased energy demand on water resources. (UNITED STATES OF AMERICA)
748	TS	43	43	43	51	Suggest adding treatment of building energy efficiciencies. (UNITED STATES OF AMERICA)
749	TS	43	43	43	51	It seems to us that the bold text may underestimate that some of the impacts may be quite severe if not properly handled. Furthermore in the body of the text in this para is unbalanced in relation to the description of other issues such as REDD+ and biofu (NORWAY)
750	TS	43	55	44	3	There is insufficient evidence in 10.2 to support the claim that "Climate change is about as likely as not…" Evidence in 10.2 points to several areas where pipelines and grids are vulnerable, but does not indicate anything about the likelihood. If this assertion is based on expert judgment, the reasoning should be more transparent.\n\n (NETHERLANDS)
751	TS	44	5	44	7	Check sentence: should = under? (GERMANY)
752	TS	44	5	44	7	Is this specific to cold regions? (UNITED STATES OF AMERICA)
753	TS	44	5	44	9	Why nothing on marine transport (shipping), which would be affected by changes in storminess. There are several published studies. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
754	TS	44	6	44	6	Consider exchanging "would" and "should" with "will" and "with" to generate "…which will happen more frequently with climate change." to clarify that this is not as hypothetical as it now sounds. (NORWAY)
755	TS	44	13	44	16	The relationship with tourism is overly simplified. Should be careful when indicating gains in countries close to the poles and higher altitudes and losses in other countries. Temperature is not the sole control on tourism. (Vieira, Goncalo, University of Lisbon)
756	TS	44	26	0	0	Add section 8.2.3.3 to note example of sectoral water-availabilty impacts. (Backus, George, Sandia National Laboratories)
757	TS	44	26	44	26	Energy demand/production is also a factor (UNITED STATES OF AMERICA)
758	TS	44	28	44	30	Case studies on US-Florida, UK-City of Hull, India, Guyana, Tanzania, Mali, China and Samoa are included in the report. They found that existing climate patterns are responsible for annualized losses of 1-12% of GDP and are likely to rise up to 19% of GDP by 2030. http://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)
759	TS	44	29	44	30	While climate change will likely exacerbate these problems, it seems likely that lack of education and sanitation are probably primary factors rather than climate change (UNITED STATES OF AMERICA)
760	TS	44	32	0	36	See broad comments in File: IPCC-AR5-NBCCRC-Maclellan-2013.pdf. Without a bibliometric baseline, it is difficult to judge knowledge gaps as inferred here. (MacLellan, James, University of New Brunswick)
761	TS	44	38	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
762	TS	44	38	45	36	This section but also overall in the entire technical summary examples from Latin America and the Caribbean are missing. There is plenty of information available. The report is heavily represented on European examples, and the region with less number of examples or scientific information to back up statements is Latin America and the Caribbean. There are enough scientific papers and conferences reports to fill in this information gap. (Lacambra Segura, Carmen, Grupo La era)
763	TS	44	38	45	36	The number of examples representing each region appears to be unbalanced; there is no introduction of any Asian Sectoral Risks (key economic sectors and services) whereas there are many examples for other regions. A suggested addition is: "Many Asian countries are major tourist destinations and more studies are needed to understand the impact of climate change on tourism. With respect to beach tourism, large developing countries and small islands states may be among the most vulnerable due to high exposure and low adaptive capacity. A number of Asian countries were found vulnerable in this regard." (Chapter 24 page 31 lines 53 - page 32 line 2) (JAPAN)
764	TS	44	39	44	56	Specific regional examples are Eurocentric focused. Would be good of you to have a Pacific Islands focus particularly related to energy use. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
765	TS	44	44	5	9	An additional factor to be included in transportation infrastructure is transport using waterways. Drought has already impacted shipping on the Mississippi River. Altered timing of snowmelt and resulting changes in river hydrographs will require increased use of dredging and could curtail alternative uses of water. (UNITED STATES OF AMERICA)
766	TS	44	49	44	52	Ref (15.44.15.47) states that river flood damages are increasing due to development in flood zones and in the current reference climate change is being attributed to increased river flood risk and if unabated increased flood damages.\n\n (NETHERLANDS)
767	TS	44	53	44	55	Is the text true for Europe, too? Temps close above and below zero cause most damages on roads and buildings (congelifraction). (GERMANY)
768	TS	44	55	0	0	How can severe accidents be affected by climate change? Will the severeness decrease or the number, and why? and is there an effect an road traffic or only on transport? (GERMANY)
769	TS	44	55	44	55	Maybe rethink if you want to keep "medium confidence", since cited par. 23.3.3 starts with this sentence "knowledge on the effects of climate change on transport in Europe remains limited (Koetse and Rietveld, 2009)"\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
770	TS	44	56	0	0	Please insert confidence level: "…summer after 2050 (medium confidence)." (Ch. 23, P3, l. 53). (GERMANY)
771	TS	44	56	44	56	here you refer to "damages", but in the cited ref (chap 23, p. 14, lines 38 and 39) you write about "delays", not damages.\n\n (NETHERLANDS)
772	TS	45	1	0	0	Please insert confidence level: "…temperatures will increase (medium confidence)." (Ch. 23, P4, l. 1) (GERMANY)
773	TS	45	1	45	14	This is rather long. Suggest that it be consolidated (i.e., shortened) (UNITED STATES OF AMERICA)
774	TS	45	26	45	27	Chapter 25 states annual peak electricity demand could decrease in NZ and NSW, but increase in QLD and SA; it mentions decreasing winter heatinbg demand, but gives no explicit references as support; it does not give a confidence level. TS says winter heating demand could decrease in NZ and southern states, with high confidence. \n\n (NETHERLANDS)
775	TS	45	28	0	0	In North America, there is an emerging concern that… - presumably what is meant is more like "Evidence is emerging that ... in North America, and this may well apply to other (developed) economies."? (Ingram, William, Met Office)
776	TS	45	28	45	29	Is this all of the information that is available for North America? (UNITED STATES OF AMERICA)
777	TS	45	34	0	0	Please insert confidence level: "…transportation networks (high confidence)". (Ch. 28, P5, l. 49) (GERMANY)
778	TS	45	36	0	0	Please insert confidence level: "…the Arctic (high confidence)". (Ch. 28, P4, l.5) (GERMANY)
779	TS	45	41	45	49	One of the most critical impacts on health is hypersensitivity for plant allergen like allergic rhinitis and asthma sensitized by tree pollens of which concentration is influenced by changes in ecosystem. This fact needs to be added. (REPUBLIC OF KOREA)
780	TS	45	43	45	43	Would fires be through climate change (changes in thermal regime, fuel loads and lightning strikes) or human-started? (UNITED STATES OF AMERICA)
781	TS	45	46	45	46	The text says "increased risks of food and water-borne diseases" - why only increases? Surely it will depend on the climatic preferences of the individual pathogen, in some areas it might become unsuitable for the pathogen. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
782	TS	45	47	45	48	Delete "reduction of disease-carrying vectors", since this pronouncement cannot be found in chapter 11.5. as such. (GERMANY)
783	TS	46	5	45	6	This needs to be expanded to include human activities, aerosols, increased impacts. (UNITED STATES OF AMERICA)
784	TS	46	5	46	6	We suggest to substantiate mentioning the US and Europe, the regions where the majority of the sudies on air quality have taken place\n\n (NETHERLANDS)
785	TS	46	12	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
786	TS	46	13	46	45	More specific regional examples in the Pacific island countries; particularly related to incidents of vectorborne diseases such as malaria and dengue and changes in insect habitat based on climate change records of temperature and rainfall changes within the last century. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
787	TS	46	20	46	20	here you say "assuming future emissions reductions", but in the cited ref (23.6.1) it's written "assuming no change in future emissions or other factors", which is different\n\n (NETHERLANDS)
788	TS	46	21	46	24	Why is this general statement in the Health section? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
789	TS	46	24	46	24	based on what you wrote in the cited ref 23.2.2 [i.e., "evidence about future risks from climate change with respect to infectious diseases is still limited (Semenza et al., 2012)(Randolph and Rogers, 2010)"], We would use a more conservative sentence instead of "Climate change will change the distribution and..." (for instance adding a "likely"?)\n\n (NETHERLANDS)
790	TS	46	25	0	0	Please insert confidence level:"…by arthropods (medium level)". (Ch. 23, P4, l. 15) (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
791	TS	46	25	46	25	...infections… transmitted by arthropods. is a bit vague (many readers may not know what arthropods are) compared to specifically mentioning malaria as increasing in Asia (TS p. 46, l.27). To clarify, please give examples e.g. malaria (transmitted by mo (NORWAY)
792	TS	46	29	46	34	It is confusing to apply confidence statements to compound / multi-clause statements. Does it apply to the whole sentence, or the last part, or…?\n\n (NETHERLANDS)
793	TS	46	29	46	34	Not clear what the evidence is for statements on chronic disease or children.\n\n (NETHERLANDS)
794	TS	46	37	46	41	This suggests that in North America there are no poor communities which is not true. Please revise. (UNITED STATES OF AMERICA)
795	TS	46	42	42	44	Statement is too general. There is ample of literature on the potential expansion of Malaria and dengue. There are even ongoing adaptation projects in Barbados, Colombia to reduce such risk. GEF is implementing a project in Bhutan, China, Jordan, Kenya, Barbados and Uzbekistan. In Mexico there is published research relating diseases, water, poverty and climate change. (Lacambra Segura, Carmen, Grupo La era)
796	TS	46	42	46	44	This finding is not restricted to Central and South America. (UNITED STATES OF AMERICA)
797	TS	47	9	47	16	The level of confidence attributed to the statement "Climate change will have significant impacts on forms of migration that compromise human security(medium agreement, medium evidence)." seems not consistent to the supporting material in the main text of Chapter 9. According to Chapter 9 page 14 line 21 ,"extreme evente=s might lead to changed patterns of migration", while "the impacts of climate change are likely to affect population distribution and mobility." The conclusion in Chapter 9 page 14 line 50 shows "the detection of the effects of climate change on infra-rural and rural- to urban migration remains a major challenge". Considering all the confidence level in these main texts, maybe in the SPM it would be better to bring the agreement and evidence level back to a lower level and change the expression to " Climate change migh t(or " is likely to") have impacts on forms of migration that compromise human security."\n\n (NETHERLANDS)
798	TS	47	16	47	16	This finding is not restricted to developing countries. (UNITED STATES OF AMERICA)
799	TS	47	21	47	21	Clarification on what a 'state' is would be helpful. Are these regions? Countries? Communities? (UNITED STATES OF AMERICA)
800	TS	47	28	47	29	Please add this para to SPM (P 12, l.56): "Climate change affects cultures and cultural expressions…." (GERMANY)
801	TS	47	28	47	33	Archaeologists have known this for a very long time. See pub by Hegmon et al., 2008 (cited on page 17 line 31) (UNITED STATES OF AMERICA)
802	TS	47	35	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
803	TS	47	36	47	45	More specific regional examples in the Pacific island nations related to human security national security policies, and cultural forms of expression particularly related to traditional knowledge (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
804	TS	47	37	47	37	... Including buildings, local industries, landscapes, and iconic places such as Venice: Section 23.5.4, page 28 line 35, states that Venice previously was vulnerable to flooding, but that adaptation measures have now been taken and that the frequency of storm surges may decrease, so that now the climate change impact on Venice is estimated to be smaller. Suggest to skip the reference to Venice.\n\n (NETHERLANDS)
805	TS	47	38	47	38	Reference to Table 23-5 not correct, should be Table 23-4?\n\n (NETHERLANDS)
806	TS	47	39	47	45	The example on the Arctic does not really pertain to "human security". (GERMANY)
807	TS	47	43	47	45	The second part of the sentence "and are often … rivers and lakes." is not supported by the findings in the main chapter. Section 28.2.4 does not mention a percentage of arctic people living near bodies of water, and it does not mention how the impacts are different for such people.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
808	TS	47	44	0	0	Please insert confidence level:"….diverse settlements (high confidence),…" (Ch. 28, P4, l. 32) (GERMANY)
809	TS	48	13	0	0	Some crucial factors for motivating adaptation strategies or measures are listed, but the idea of climate resilience as a long-term objective is still missing. We suggest to add (in Executive Summary of Ch. 14 P 2 L 46; TS P 48 L 13 and SPM P 5 L 14): "For example, in a development context resilience ´evokes positive and broad development goals (e.g., education, livelihood improvements, food security), includes multiple scales (temporal and spatial) and objectives, better captures the complex interactions between human societies and their environments, and emphasizes learning and feedbacks´ (Moss et al., to appear)." Source: Chapter 14, P 20 L 45-48. (GERMANY)
810	TS	48	15	0	0	Examples of what? This is a new paragraph. (Stone, Dáithí, University of Cape Town)
811	TS	48	15	48	18	It is not quite clear, why there is one specific example for North America only, in particular as the first para of the sub-section does not mention NA as a critical region. Either add some other regions as well, or leave out. (GERMANY)
812	TS	48	15	48	19	Despite the discussion that "most severe impacts are projected for urban areas and some regions in sub-Saharan Africa and Southeast Asia," 'TS page 47 lines 51-52) the only example introduced as a sectoral risk for livelihoods and poverty is from the North American continent. A suggested addition is: "Floods, droughts and changes in seasonal rainfall patterns are expected to negatively impact crop yields, food security and livelihood in vulnerable areas, Rural poverty in parts of Asia could be exacerbated due to negative climate change impacts on the rice crop and increased in food prices and the cost of living. The poverty impacts of climate change would be heterogeneous among countries and social groups. In a low crop productivity scenario, food exporting countries, such as Indonesia, the Philippines and Thailand would benefit from climate change related global food price rises and be able to reduce poverty, while countries such as Bangladesh would experience a net increase in poverty of 15% by 2030." (Chapter 24 page 35 line 53 - page 36 line 6) (JAPAN)
813	TS	48	16	48	18	More specific examples related to regional examples of social protection livelihoods and poverty and in particular urban and rural adaptation climate change initiatives (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
814	TS	48	16	48	18	Are there any additional examples for North America? (UNITED STATES OF AMERICA)
815	TS	48	23	48	23	How is this expert judgement evaluated? Is there any metric? (UNITED STATES OF AMERICA)
816	TS	48	23	48	26	Figure TS.12 is very qualitative and judgemental. Is this an appropriate assessment of the science? (UNITED STATES OF AMERICA)
817	TS	48	30	48	30	Table TS.5 would benefit from being shortened. (UNITED STATES OF AMERICA)
818	TS	48	32	48	35	This seems awkward and needs elaboration/clarification. It appears that Table TS.6 and TS.7 are a repeat of TS.5 (UNITED STATES OF AMERICA)
819	TS	48	37	48	43	On figure TS.12 it is unclear why 'ocean systems' are always left blank. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
820	TS	48	45	48	56	Table TS. 5, Europe - Marine & Coastal (page 99) I strongly disagree that climate change will not entail "relocation of fishing fleets" as this would be very context specific and in certain parts of Europe we are seeing some changes in fleet behaviour/location to make the most of new opportunities (e.g. in the UK). Perhaps "not necessarily entail relocation" would be better. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
821	TS	49	0	0	0	Figure TS.14 Comment - This figure is the same as figure TS.9C. It is recommended that TS 14 be removed and reference made to figure TS.9C to minimize repetition. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
822	TS	49	1	50	22	Spatial convergence of impacts in different sectors creates impact hotspots. Mention Pacific island countries and impact hotspots located in Fiji and Vanuatu, Tuvalu, KIribati (particularly related to low-lying coral atolls). (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
823	TS	49	19	49	21	Note that figure TS. 14 is duplicated in it's entirety within TS. 9 (page 124) - is this necessary?? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
824	TS	49	24	50	47	Here is a reproduction of the ES of Chapter 19 (see the comment of the Chinese government on Chapter 19). It is suggested to simplify and elaborate the conclusions and ensure their consistency with the revised ES of Chapter 19. (CHINA)
825	TS	49	24	55	0	Section C.ii should mention potential "tipping points", including those natural/biophysical, social and economic systems. Currently, the term tipping point is only used on P 47, L 34 for terrestrial and freshwater ecosystems, and on p 50, l 49 for socio-ecological systems (GERMANY)
826	TS	49	30	49	44	A key risk lacking here is loss of biodiversity, ecosystem function and services. Pleae include a discription of this factor. (NORWAY)
827	TS	49	43	49	44	Education and sanitation are also factors (UNITED STATES OF AMERICA)
828	TS	49	46	49	46	The TS uses a variety of baslines which makes it difficult to compare impacts. This line uses "pre-industrial" as a baseline yet on p.51, line 54, the baseline is 1886-1905, "early industrial", and Fig. TS.9 uses 1870-1889. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
829	TS	49	46	49	46	The finding in the bolded text would be more clear if the exampel in the next sentence was included in the bolded text. (NORWAY)
830	TS	49	51	49	54	The key finding in the bolded text is mostly about process while the findings in the text after is very important and this should be better reflected in the bolded text. (NORWAY)
831	TS	49	51	50	22	These examples provide a good summary of a lot of previous text. Suggest that the authors use this approach to shorten the previous section. (UNITED STATES OF AMERICA)
832	TS	50	5	50	7	This is an exampel of a very important finding. (NORWAY)
833	TS	50	8	0	0	Soil could be mentioned here as a possible mediator of water quality, water stores ?Chapter 19?? (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
834	TS	50	15	50	15	What is a "sector"? (UNITED STATES OF AMERICA)
835	TS	50	17	50	18	Mariana Island should presumably be "the Mariana Islands" (Ingram, William, Met Office)
836	TS	50	22	50	23	In the executive sumary of chapter 19 (page 3) there is a list of interactions that increase vulnerabilities and risk. There are 6 bullet points; all of these are present in the TS and SPM as well, except for the last one: "adaptation designed for one sector may interfere with the functioning of another sector, creating new risks". This bullet point should also be included in TS and SPM, as it is a very important interaction to consider. Nowadays the efforts of scientists and policymakers are put into finding and implementing solutions to face the effects of climate changes. Unfortunately, too often action is taken based on limited or unilateral information, without considering possible effects on other sectors or fields. Therefore, it is necessary to stress the importance of evaluating all possible consequences of adaptation measures before putting them into practice.\n\n (NETHERLANDS)
837	TS	50	42	0	0	soil as a factor in crop production, CRP and other soil protection programs in danger from food/biofuel need, degrading soil resources (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)

#	Ch	From Page	From Line	To Page	To Line	Comment
838	TS	50	42	50	47	SRM is not a climate change impact, it is therefore not justified to mention SRM in the sub clause in this para. In addition, wording implies that SRM technologies are already at hand. Please reformulate. Please consider the large uncertainties attached to SRM and reformulate, e.g.: "…and adverse regional impacts p o t e n t i a l l y arising from Solar Radiation Management...". (GERMANY)
839	TS	51	5	51	6	"Since mitigation reduces the rate as well as the magnitude of warming, it also delays the need to adapt to a particular level of climate change impacts, potentially by several decades." This sentence itself is valid. Due to the inertia of the climate system, however, the temperature rise will continue even that the increased emission comes to a stop now. But it is very important to actively take adaptation measures to address the adverse impacts that have already occurred. In order to express the conclusion in a balanced manner, it is suggested to add after this sentence the following: "However, it is very necessary to take adaptation measures to address the adverse impacts that have already occurred or are occurring". (CHINA)
840	TS	51	13	51	15	Please highlight this important statement in bold. (GERMANY)
841	TS	51	26	51	26	Table TS.8 appears to be a summary of Table TS.5 (UNITED STATES OF AMERICA)
842	TS	51	37	51	45	There is nothing in this paragraph that could perhaps be stated for many non-island (non-insular) poor and vulnerable coastal areas. Whilst e.g. SIDS may be special cases, their specificity perhaps needs to be clearer here, because landlocked states - as one example - also face particular challenges. (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
843	TS	51	48	52	17	This is very important, and should be further developed. Also projected impacts of other temperature scenarios could be described (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
844	TS	51	52	51	52	Add "levels" after "preindustrial" to generate "… preindustrial levels..." (NORWAY)
845	TS	52	2	52	2	Add "levels" after "preindustrial" to generate "… preindustrial levels..." (NORWAY)
846	TS	52	2	52	10	Also mention other biological systems that may be very adversely affected by a temperature increase of 4 degrees C or more, e.g. boreal forests, arctic systems (including permafrost), tropical rain forests. (NORWAY)
847	TS	52	4	52	4	Add "with corresponding effects on associated biodiversity, ecosystem function and services and ultimately social systems and human well being." since coral reefs are extremely important for tropical marine ecosystems and their production of biodiversity (NORWAY)
848	TS	52	8	52	8	Consider including droughts in the US in 2011, 2012: power deratings, crop failures. (UNITED STATES OF AMERICA)
849	TS	52	11	52	14	Chapter 18 clearly mentions that the permafrost in the arctic has receded and on the other hand ice layer in Antarctic region has increased and hence the generalisation of decrease of ice layer of whole permafrost region seems not an accurate summary of the chapter.\n\n (NETHERLANDS)
850	TS	52	13	52	13	The TS reports for Sub Saharan Africa on increase of the risk of disease, while in the body of the chapter 19) only malaria is mentioned, and only for some areas (section 19.5.1, page 27, line 42)\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
851	TS	52	24	53	50	Box TS.7: \n1) Some sort of calibration is needed for the risk portrayed: even if qualitative and based on expert jugdment, an indication of what constitutes "high" risk for each of the categories is mandatory, also as a guide to interpretation with regard to "dangerous" anthropogenic interferene with the climate system. In addition, it is not obvious how a detection and attribution anaylsis of past and present impacts translates into a statement of risk. \n2) We recommend to spell out the AR4 assessment for those cases where "the risk has not changed". \n3) The Box appears conceptually unclear concerning detection&attribution. On the one hand, in L 3-7 it is stated that "...detection and attribution....supports assessments of current conditions with respect to reasons for concern", however in the following "update" section, that assessment is not integrated. E.g. in Ch 18 it is stated "...Evidence from detection and attribution analysis supports concerns that both the Arctic and the global warm-water coral reef system are experiencing irreversible regime shifts" - onsets of global regime shifts constitute a massive RFC, however this has not been taken up here or elsewhere in the TS. The statement in L 16 "there is higher confidence...", and how it relates to the assessment made for unique and threatened systems, is not clear. Please consider to include the support of mention the high risk even at T below 2° to Arctic and tropcial coral reef ecosystems, as well as the tundra biome to the assessment made for unique and threatened systems. \n4) There seems to be a lack of information on aggregate economic impacts, both in present and for the future; it is not clear, therefore, how this risk has been assessed. \n5) Please add explanations on the meaning of "global aggregate impacts".\n6) Please add explanations on the meaning of "distribution of impacts" - is it the geographical distribution? \n7) Please explain "large-scale singular events", in addition to the deglaciation of Greenland. Please provide the statement of AR4, not everybody remembers.\n8) What does "globally aggregated risk" mean? (GERMANY)
852	TS	52	28	52	30	Please add a sentence on attribution. (GERMANY)
853	TS	52	49	52	21	Box TS.6: See our comment on Box SPM.5. (GERMANY)
854	TS	52	53	0	0	Box TS.7: See our comments on Box SPM.6. (GERMANY)
855	TS	53	10	53	12	Is there any confidence in rates of change? What does it mean for temps over 2 degrees C pre-industrial? (UNITED STATES OF AMERICA)
856	TS	53	20	0	0	A reference to 18.6.2.2 should go in the middle here. (Stone, Dáithí, University of Cape Town)
857	TS	53	25	53	27	Does this refer to global or local warming? (Caesar, John, Met Office Hadley Centre)
858	TS	53	25	53	27	Developed countries are probably at most economic risk. What are the thresholds or tipping points for economic disaster? (UNITED STATES OF AMERICA)
859	TS	53	28	53	33	A reference to 18.6.2.4 could maybe support this. I think it supports this statement... (Stone, Dáithí, University of Cape Town)
860	TS	53	34	53	35	A proposed slight addition to the conclusion about large-scale singular events.\nThe TS contains a summary about large-scale singular events that is derived from Chapter 19. I proposed the slight modification in the following summary statement in the Chapter 19 Executive Summary:\n\nThe risk from large-scale singular events, such as large-scale irreversible deglaciation, of the East Antarctica Ice Sheet, remains comparable to that assessed in AR4.\n\nAs explained in a comment on the overall WGII, the Technical Summary should summarize the conclusions about large-scale singular events in all WGII chapters—not just Chapter 19. The Chapter 28 about the Polar Regions contains additional summaries about large-scale ecosystem changes in Greenland, such as “rapid colonization of ice-free ground” (Chapter 28, page 25, lines 35-38). So, I propose a slight addition to the overall TS summary, as follows (TS, page 53, lines 34 and 35):\n\nThe risk associated with large-scale irreversible deglaciation, of East Antarctica Ice Sheet remains comparable to that assessed in AR4 (19.6.3). However, rapid colonization of ice-free ground is evident around the Greenland Ice Sheet (28.2.3.7). (Newbury, Thomas Dunning, U.S. Department of the Interior (retired))

#	Ch	From Page	From Line	To Page	To Line	Comment
861	TS	53	34	53	35	This sentence is awkward. Please revise it. (UNITED STATES OF AMERICA)
862	TS	53	34	53	35	A reference to 18.6.2.5 might be appropriate. (Stone, Dáithí, University of Cape Town)
863	TS	54	1	54	29	The total financial need for adaptation was mentioned to be 75-100 Billion US Dollars. It is suggested to assess the financial need of developing countries for adaptation. (CHINA)
864	TS	54	1	54	29	For the 75-100 billion adaptation fund, the author should specify that how much (or what proportion) is for the demand of developing countries. SUGGESTION: specify the exact number (percentage) for developing countries. (PAN, Jiahua, Chinese Academy of Social Sciences)
865	TS	54	5	54	7	I don't think it is appropriate to pick "the most recent" estimate as implicitely better than others and give this range, even if it is politically desirable to have one. The range simply is extremely broad depending on assumptions, response stratgegies and real climate impacts. We should acknowledge this and refrain from picking certain values or narrow intervals as best estimates. There is simply not enough convergence in the literature. (Harnisch, Jochen , KfW)
866	TS	54	5	54	9	Most recent estimate of global adaptation costs, as shown in table 17.2, is that from World Bank 2010. This source states that in 2050 annual adaptation costs range from 70 to 100 USD billion. Not from 75 to 100 USD billion.\n\n (NETHERLANDS)
867	TS	54	5	54	9	Cannot find the reference in the main text of chapter 17 corresponding to the statement '.., and important shortcomings in the data and methods available for costing adaptation suggest the low end of this range could be substantially lower.' \n\n (NETHERLANDS)
868	TS	54	5	54	9	What about natural hazards, e.g., non-climate events (e.g., seismic)? (UNITED STATES OF AMERICA)
869	TS	54	5	54	29	Losses from floods, storms, earthquakes and other natural catastrophes (Nat Cat) impact the economies of entire countries and are therefore a key driver of the re/insurance business. Such losses are becoming more frequent and severe due to higher insurance penetration and the concentration of assets in exposed areas as well as climate change. If unmitigated, climate change could cost the world economy around 20% of global GDP by the end of this century.\nA good example for a consistent framework is the Economics of Climate Adaptation Framework. http://media.swissre.com/documents/rethinking_shaping_climate_resilent_development_en.pdf (Mueller, Lea, Swiss Reinsurance Company Ltd)
870	TS	54	6	0	0	To which climate change scenario do these costs refer? (GERMANY)
871	TS	54	10	54	12	Reference paragraphs 17.3.10 and 17.3.11 do not exist\n\n (NETHERLANDS)
872	TS	54	14	54	14	Where indicated "This is due to ecological effects resulting from reductions in the duration and extent of ice cover and enhanced..." it should say "...duration and extent of snow cover and enhanced..."; however, if the point is to indicate sea-ice, you should you sea-ice instead. I think that it is snow cover, since we are dealing with the terrestrial environment. (Silva Mora, Carla Andreia, University of Lisbon)
873	TS	54	16	54	16	What is the sector to which the authors refer? (UNITED STATES OF AMERICA)
874	TS	54	17	54	20	Paragraph 17.6.3 does not seem to be the most relevant here. The problem of underinvestment and adaptation deficit resulting from underdevelopment is mentioned in paragraph 17.6.1. However, the problem seems to be covered in a more detailed way in TS than in the main text, giving impression that TS refers directly to the referenced article by Parry et al. (2009)\n\n (NETHERLANDS)
875	TS	54	22	54	22	“Studies costing adaptation” better than “Adaptation costing studies” ??. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
876	TS	54	38	54	44	Box CC-OA should be added as the source\n\n (NETHERLANDS)
877	TS	54	43	54	43	Suggest “where eutrophication and upwelling also influence local ocean pH” – not sure they contribute to acidification per se – but they do influence pH. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)

#	Ch	From Page	From Line	To Page	To Line	Comment
878	TS	54	44	54	44	I suggest the text reads "....local ocean acidification and or buffering may occur." (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
879	TS	54	46	54	47	If it is "poorly understood: why do you worry so much about it? (Gray, Vincent, Climate Consultant)
880	TS	54	50	54	55	On line 50, the reference to section 6.2.4 should be changed to 6.2. On line 52, reference should be made to section 6.2.4 after the statement "Growth and primary production are stimulated in seagrasses". On line 53, reference should be made to section 6.2.3.4 after the words "some phytoplankton". On line 55, reference to section 6.2.4 should be changed to 6.2.5.3. (UNITED STATES OF AMERICA)
881	TS	54	54	44	44	Reference to the incorrect section. Change “5.3.3.6” to “5.3.3.5”. (UNITED STATES OF AMERICA)
882	TS	55	0	0	0	Box TS9. Nice balanced box on Ocean Acidification. (HAWKINS, STEPHEN, UNIVERSITY OF SOUTHAMPTON)
883	TS	55	13	55	13	Impacts on prey is rather constraining. Consider instead, impacts associated with trophic dynamics (UNITED STATES OF AMERICA)
884	TS	55	14	55	16	I strongly disagree with this statement as there have been only 2 modelling studies on the indirect food-web consequences of ocean acidification for fisheries. Therefore 'high agreement' would be meaningless. I do not think it is possible to conclusively state that "ocean acidification will generally reduce fish biomass and catch" - there is some emerging evidence that the opposite might be true in certain areas. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
885	TS	56	10	57	43	Please consider including in this section more about ecosystem-based approaches. (NORWAY)
886	TS	56	16	56	18	Monitoring climate parameters and their effects as well as effectiveness of adaptation and mitigation efforts is a very important point that should be highlighted, especially to emphasise the importance of financing such monitoring programs over long time (NORWAY)
887	TS	56	33	56	34	Please consider to include this finding in the SPM. (NORWAY)
888	TS	56	36	56	39	Readability of statement would improve from cutting into shorter sentences.\n\n (NETHERLANDS)
889	TS	56	41	56	41	Please include as a the first finding the general ideas given in Ch 1 P12, L14-30 as they link the conceptual framework of Rockström and Raworth with the IPCC AR5 concept of "era of responsibility and era of climate options", explain better the "opportunity space" given in Figure 1-7 (here Figure TS.16) and give strong reasons for including Figure 1-7 into TS. Text proposal for a finding: "Rapidly advancing climate science provides an “opportunity space” for policy relevant information to support policy decisions leading to high resilience, low risk and low vulnerability and climate change is just one of many stressors that influence resilience. The conceptual framework of the AR5 WGII report of existing stressors and the boundaries they create, of actions to reduce climate change impacts can entail both an era of responsibility and an era of climate options. The last is an opportunity space and the decisions and pathways that societies choose within this space, informed by science, observation and experience, will affect the degree of resilience in human and natural systems. Please add confidence level [1.1.4, Figure 1-7]" After this inclusion Figure TS.16 suits better below this findig --> please shift the figure and its legend below the new finding. (GERMANY)
890	TS	56	42	56	42	Statement starts with "Because climate change is a growing threat". It should probable read: "Because human-induced climate change..."\n\n (NETHERLANDS)
891	TS	56	42	56	43	Please consider to include this finding in the SPM. (NORWAY)
892	TS	56	43	56	43	Indication as high agreement does not reflect the discussion in the literature. The idea of "climate resilient pathways" is based on a UN report (see p. 4 of Chapter 20). Chapter 20 does not show that the idea of "climate-resilient pathways" is drawn from the review of the academic literature. \n\n (NETHERLANDS)
893	TS	56	44	56	44	Statement reads "added to other stresses". Please indicate which other stresses.\n\n (NETHERLANDS)
894	TS	56	44	56	47	Statement is unclear and would benefit from cutting into shorter sentences and rephrashing.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
895	TS	56	45	56	45	Line mentions "such objectives". Please indicate to which objectives "such objectives" refer.\n\n (NETHERLANDS)
896	TS	56	46	56	46	Line includes "but". But refers to a contrast. Which contrast is meant here?\n\n (NETHERLANDS)
897	TS	56	51	56	53	it is not clear how this sentence connects to the previous one: do adaption and mitigation fall under (a) and sustainable development falls under (b)? \n\n (NETHERLANDS)
898	TS	56	53	56	53	Statement starts with "Both kinds". What is meant with "both"? Adaption as well as mitigation? Or adaptation and mitigation as well as sustainable development strategies and choices?\n\n (NETHERLANDS)
899	TS	56	53	56	53	Line includes "climate change responses" directly followed by "Both kind of responses". Using of the word "responses" directly after each other in different ways may be confusing.\n\n (NETHERLANDS)
900	TS	56	53	56	54	what are you refering to when talking about both kind of responses?, do you mean 1. adaption and mitigation and 2. sustainable development?\n\n (NETHERLANDS)
901	TS	57	1	57	1	what are the two categories of responses?\n\n (NETHERLANDS)
902	TS	57	1	57	1	What is meant with "each of the two categories of responses"?\n\n (NETHERLANDS)
903	TS	57	2	57	2	Indicating statement as "high confidence" and "high agreement" is not supported by the underlying material. Medium confidence and medium agreement would be more appropriate. Please also bear in mind that "resilience" is a frame to interprete empirical phenomena. Using "resilience" as a research frame is also still under discussion itself. See e.g. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. \n\n (NETHERLANDS)
904	TS	57	3	57	4	Please avoid circular reasoning. Sentence now reads: pathways that are resilient are likely to be resilient.\n\n (NETHERLANDS)
905	TS	57	3	57	6	Statement is unclear and would benefit from cutting into shorter sentences and rephrashing.\n\n (NETHERLANDS)
906	TS	57	5	57	5	what are you referring to by goals?\n\n (NETHERLANDS)
907	TS	57	5	57	5	Which goals are meant with "each goal"? Please indicate.\n\n (NETHERLANDS)
908	TS	57	5	57	5	Please indicate what is meant with "the other".\n\n (NETHERLANDS)
909	TS	57	5	57	5	Please indicate which contrast is meant, when using the word "but". \n\n (NETHERLANDS)
910	TS	57	5	57	6	Please indicate which "windows of opportunity" are meant and why these opportunities may narrow over time.\n\n (NETHERLANDS)
911	TS	57	25	57	29	Again, indicating statement as "high confidence" and "high agreement" is not supported by the underlying material. Medium confidence and medium agreement would be more appropriate. Please bear in mind that "resilience" is a frame to interprete empirical phenomena. Using "resilience" as a research frame is still under discussion itself. See e.g. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. \n\n (NETHERLANDS)
912	TS	57	25	58	23	Some of the bolded texts here represents important findings. Please consider to reflect the essence of some of them in the SPM sect. D.i. or D.ii. (NORWAY)
913	TS	57	26	57	29	The statement is too long and not clear. Please rephrase the sentence.\n\n (NETHERLANDS)
914	TS	57	31	57	35	Similar to previous comment, indicating statement as "high confidence" and "high agreement" is not supported by the underlying material. Medium confidence and medium agreement would be more appropriate. Please bear in mind that "resilience" is a frame to interprete empirical phenomena. Using "resilience" as a research frame is still under discussion itself. See e.g. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. \n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
915	TS	57	37	0	0	Recent research suggests that mitigation and adaptation are likely to be more effective when they are designed and implemented in the context of other interventions within the broader context of sustainability and resilience. (Chapter 20 page 16 lines 41-50) This is a fundamental message of the IPCC which has been stated since the TAR that needs to be reinforced as there are always newcomers to the climate change field unfamiliar with past reports; and therefore, we strongly suggest that its is included in the TS as a starting point. (JAPAN)
916	TS	57	37	57	43	Although in this paragraph, the author emphasizes that "Although at a global scale both mitigation and adaptation are essential, relatively local scales in many developing regions have limited capacities to include mitigation in their climate-resilience strategies because they contribute very little to the causes of climate change.", the author should further illustrate the importance of adaptation at relatively local scales, in order to make this sentence to be more complete. SUGGESTION: add that "the developing countries should pay more efforts on adaptation" after the aboving quotated sentence. (PAN, Jiahua, Chinese Academy of Social Sciences)
917	TS	57	39	57	39	Please indicate to which scales "those scales" refer.\n\n (NETHERLANDS)
918	TS	57	40	57	42	limited capacity for climate change mitigation attributed by little contribution to climate change is not logical. Could it be due to poor economic and political conditions, or due to lack of awareness ?\n\n (NETHERLANDS)
919	TS	57	48	58	55	Example of co-benefits, synergies and trade-offs should include Pacific island countries and territories (PICTs).this is covered to some degree on page 59 from lines 43 to 52. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
920	TS	57	53	0	0	Another example could be that of removing the CRP program to grow more crops, but then reducing the soil resource ??see food systems? (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
921	TS	57	53	57	55	Water use for irrigation during drought also has impacts for energy systems (as well as downstream ecosystems) (UNITED STATES OF AMERICA)
922	TS	58	9	58	13	Reference to the text should be changed from 3.7.2 to 3.7.2.1\n\n (NETHERLANDS)
923	TS	58	11	58	12	This sentence should read: "Hydropower CAN have negative effects on freshwater ecosystems that can be reduced by appropriate management." (Lane, Tracy, International Hydropower Association (IHA))
924	TS	58	11	58	12	Need clarification regarding the operational aspects of hydropower and negative impacts. Many freshwater ecosystems are impacted because of clearcutting, other land use practices upstream of hydropower systems. Hydropower systems are contributing factors, but not the only factor. (UNITED STATES OF AMERICA)
925	TS	58	15	58	17	A concern presented in Chapter 4 and should be stated here is about large-scale forest conversion or land use change leading to habitat loss and fragmentation (e.g. paragraph 4.2.4.1 P11L12,P12L19), and not about "use of terrestrial biosphere in climate mitigation actions" as a whole, (e.g. mitigation actions by conservation of forests). Introduction of fast-growing tree species, which is an effective means for the rehabilitation of degraded or bare lands, should not be denied in general as mentioned here. \nFurther, this sentence seems to oppose the use of the terrestrial biosphere in climate mitigation actions and thus contradicts UNFCCC Article 4 paragraph 1(d) , "Promote sustainable management, and promote and ... including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;."\nRegarding fast-growing tree species, the relevant text raise concern about increasing water consumption in some country (semi-arid areas) in paragraph 3.7.2., but this sentence would be mistaken as if these lead to negative impacts on ecosystem and biodiversity as a whole.\nThis sentence should be deleted or revised so as to avoid unnecessary misunderstanding (JAPAN)
926	TS	58	21	58	25	The referenced Paragraph 21.5.3 does not touch upon the costs for mitigation. Reference to another chapter where this topic is discussed might be more appropriate.\n\n (NETHERLANDS)
927	TS	58	21	58	25	This part belongs to the WGIII, which has little connection with impacts. The carbon emission is not the only object, SUGGESTION: delete this part. (PAN, Jiahua, Chinese Academy of Social Sciences)

#	Ch	From Page	From Line	To Page	To Line	Comment
928	TS	58	38	0	0	No Africa Example (Sönke, Kreft, United Nations University - Institute for Environmental and Human Security)
929	TS	58	38	58	48	It also seems to us to be an imbalance between the description of impacts of different mitigation options and the relation to adaptation in the section. It is felt that the potential impacts of nuclear power as a mitigation option in relation to safety, n (NORWAY)
930	TS	58	40	58	41	The text states "Climate policies, such as encouraging cultivation of biofuels and payments under REDD, will result in mixed and potentially detrimental impacts on land-use and on the livelihoods of poor and marginalized people." The TS is not coherent with the SPM and the underlying CH 13 with regard to the certainty of the statement. Please check the use of the word "will" and "may", and the associated uncertainty statements. In addition, the wording is different in this chapter ("REDD+") from the one used in the SPM P 17 L 38 ("REDD"). (GERMANY)
931	TS	58	40	58	42	The sentence "Climate policies, such as ... payments under REDD, will result in mixed and potentially detrimental impacts on land-use and on the livelihoods of poor and marginalized people." presents a very much different evaluation on REDD+ from TS of WG3 (page45); "The implementation of REDD mechanisms and its variations that can represent a very cost-effective option for mitigation with high social and other environmental co-benefits". The relevant text of the underlying report (paragraph 9.3.3.4) raises issues related to community participation etc. in the ongoing REDD+ pilot projects, however, the REDD+ framework itself should not be judged as "potentially detrimental" only by the results of those pilot projects that are being implemented and are still in the early stages and in general lack sufficient infrastructures, framework, governance and capacity. The reviews of projects in Chapter 9, 13 are not always the result of result-based projects with payments under REDD, and references don't always reflect the result of Decision1 of UNFCCC COP16 where safeguards for REDD+ were defined, which should be promoted and supported when undertaking REDD+ activities. (Further, contents in Chapter 13 show some positive results projects even in early stages.)There is not a sufficient basis for conclusion of medium confidence.Due to the above reasons, this sentence "Climate policies, such as ... payments under REDD, will result in mixed and potentially detrimental impacts" should be deleted.But if some reference to (it any content) regarding climate policy is inevitable here, the sentence should be revised as follows; : "As climate polices, such as encouraging cultivation of biofuels, may result in mixed impacts on land-use and on the livelihoods of poor and marginalized people, the appropriate measures should be considered. " for aforementioned reason, also the contents in chapter 13 do not mean the climate polices, such as encouraging cultivation of biofuels and payments under REDD, always result in mixed impacts on land-use and on the livelihoods of poor and marginalized people. The policies might have detrimental impacts unless the appropriate policies are introduced. \n\n (JAPAN)
932	TS	58	40	58	42	To give the example of the relationship between ecosystem resilience and adaptation, "Climate Change adaptation efforts ... to the migration of plants and animals" (chapter15 P3 L23-27) should be inserted in place of "Efforts to improve ecosystem resilience can benefit adaptation". (JAPAN)
933	TS	58	40	58	42	This sentence is fundamentally flawed and must be changed. The main draft report itself - 13.3.1.2 - states that experience to date is "inadequate to permit broad generalizations about the effects of REDD+ on livelihoods and poverty". While effects may be (NORWAY)
934	TS	58	42	58	42	Delete "such as the CDM and REDD+" and add "Some..." at the beginning. There is no evidence that the policy instruments CDM and REDD+ have negative impacts on the poor. For the CDM, there is evidence that the projects have no strongly beneficial impacts on the poor, but outright negative effects are rare exceptions. See TERI (2012): Assessing the Impact of the Clean Development Mechanism on Sustainable Development and Technology Transfer, New Delhi, and also the assessment (Michaelowa, Axel, University of Zurich)
935	TS	59	7	59	14	Although this summary is given in the executive summary of Chapter 25, it is not substantiated by the facts in the Chapters indicated (e.g. 25.7.5, 25.9.1, 25.9.2, Box 25-10).\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
936	TS	59	7	59	14	The term trade-intensive is used here and in the ES of the Chapter 25, but not at all in the body of Chapter 25\n\n (NETHERLANDS)
937	TS	59	19	59	19	We can partially protect coastal properties, but protecting vulnerable areas may also be maladaptive. (UNITED STATES OF AMERICA)
938	TS	59	22	0	0	this section is very confusing (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
939	TS	59	29	59	41	Are there fertilization issues with agricultural production in South America? (UNITED STATES OF AMERICA)
940	TS	59	51	59	52	This reference to the determining influence of cultural and worldview factors relates not just to islands. Their importance could perhaps be referred to earlier in the SPM - where both appear to be downplayed. (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
941	TS	59	54	60	5	Consider to describe the risk for maladaptation for small island states in the SPM e.g. page 18 line 9. (NORWAY)
942	TS	60	3	60	5	This statement is contradictory to the statement given in the body of Chapter 29, page 24 line 4 to 5.\n\n (NETHERLANDS)
943	TS	60	19	60	27	This paragraph is too complicated to understand. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
944	TS	60	26	60	27	Sentence and meaning are very unclear. In the current formulation, the suggestion is made that statement is normative, not drawn from the literature, and a kind of random unfounded warning. Please rephrase. \n\n (NETHERLANDS)
945	TS	60	43	60	43	Discussion in the literature also includes warnings and concerns about deliberately created transformations. E.g.: Meadowcroft, M., 2009, What about the politics? Sustainable development, transition management, and long-term energy transitions. Policy Sciences, vol. 42, iss. 4, pp 323-340. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. E.g.: Voss, J.-P., Bornemann, B., 2011, The politics of reflexive governance: challenges for designing adaptive management and transition management. Ecology & Society, vol. 16, iss. 2, art. 9.\n\n (NETHERLANDS)
946	TS	60	48	60	50	Or is it the other way around? May societal debate trigger change? E.g.: Meadowcroft, M., 2009, What about the politics? Sustainable development, transition management, and long-term energy transitions. Policy Sciences, vol. 42, iss. 4, pp 323-340. E.g.: Smith, A. and Stirling, A., 2010, The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology & Society, vol. 15, iss. 1, art. 11. E.g.: Voss, J.-P., Bornemann, B., 2011, The politics of reflexive governance: challenges for designing adaptive management and transition management. Ecology & Society, vol. 16, iss. 2, art. 9.\n\n (NETHERLANDS)
947	TS	61	0	64	0	FAQs: The other WG did not include FAQ in their TS. It is suggested to treat FAQs consistently across all WGs, instead of inconsistently including them in only one of the WG's TS. If keeping FAQ in the TS: some but not all FAQs from the underlying report have been taken up in the TS, e.g. FAQ 3.6, 4.1-4.7., 6.1, etc. would also be interesting, and an FAQ on tipping points, key impacts, key risks should be added. (GERMANY)
948	TS	61	5	0	0	Please change to "Are we seeing impacts of RECENT climate change?" (GERMANY)
949	TS	61	5	61	17	Should the distinction between climate change and anthropogenic climate change be made again here? (Stone, Dáithí, University of Cape Town)

#	Ch	From Page	From Line	To Page	To Line	Comment
950	TS	61	10	61	11	Where "…hydrological cycles have been disrupted by decreased snowpack, degradation of permafrost regions, and diminishing glaciers…", replace by "…hydrological cycles have been affected by decreased snowpack, degradation of permafrost, and diminishing glaciers…" (replace "disrupted and delete "regions" after "permafrost" (Vieira, Goncalo, University of Lisbon)
951	TS	61	11	61	11	Degradation of permafrost regions is incorrect terminology. It would be better to say "degradation of permafrost in Polar regions and at high altitudes". It isn't clear what region this statement refers to. It is also not clear why ch 28 (polar regions) is not cited. (Smith, Sharon, Geological Survey of Canada)
952	TS	61	25	0	0	The uncertainty qualifier should be put in parenthesis at the end of the statement, in the current version the sentence sounds strange to those not familiar with the specific use of "confidence" in the IPCC. (GERMANY)
953	TS	61	25	61	26	evaluate carefully if you want to keep "medium confidence" and not decrease to "low confidence", since we see that in some parts of Chapter 23 there are controversial results (increase in cereals' production because of CC)\n\n (NETHERLANDS)
954	TS	61	29	0	0	It is confusing to mention change of CO2 as a consequence, not a reason of climate change, please use the word "carbon cycle" instead. (GERMANY)
955	TS	61	30	61	31	Please mention that these effects will increase with increasing climate change. (GERMANY)
956	TS	61	37	61	38	Please do not open this para with such a positive statement. Instead it of saying "only a few are positive" it should be "(by far) most are negative" (GERMANY)
957	TS	61	37	61	48	Explain WHY only a few of the impacts assessed are positive (because unprecedented changes are ipso facto not what existing systems have evolved or been designed to cope with? because hydrology becomes more extreme & less reliable across the board? because research funding is much more available for investigating potential problems & action to reduce them than for investigating potential gains with no action needed?) (Ingram, William, Met Office)
958	TS	62	1	62	1	It would be better to say "...will affect the livelihoods of fishing communities in some regions".... As increases in fish stocks will occur elsewhere. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
959	TS	62	8	62	21	This FAQ provides a definition of key vulnerabilities. In its current form, it is not adding value to the TS and should be deleted. The reader would expect information on which actually are the key vulnerabilities identified in this report, like those given in Table TS.8. (GERMANY)
960	TS	62	31	62	31	Changing property rights as well as water rights. (UNITED STATES OF AMERICA)
961	TS	62	36	0	0	Chapter 19? Is it not 12? (Stone, Dáithí, University of Cape Town)
962	TS	62	38	62	46	In this FAQ, the effects of ocean acidification are reduced to marine and coastal areas (because it comes from this chapter). However, the in context of the TS, this is not sufficient and other effects of ocean acidification must be added, e.g. on fishery, corals, etc. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
963	TS	62	43	62	45	The line states: '... has numerous implications for ocean and coastal processes and organisms, including rates of primary production, the deposition of calcium carbonate in shells and skeletons, and the degradation of limestone.' The description 'implications for rates of primary production' is too general and unclear. Cross-chapter Box Ocean Acidification clearly describes that primary production of seagrass and some phytoplankton is stimulated with the observed changes. Suggestion: 'implication for the primary production rate of seagrass and some phytoplankton'\n\n (NETHERLANDS)
964	TS	62	48	63	2	The notion of risk is missing. (GERMANY)
965	TS	62	53	62	55	The FAQ No. 8 is about vulnerabilities of communities to impacts of climate change whereas the write-up gives impression other way round, i.e. the effect of age, race etc. on past weather and climate extremes. The authors may like to consider the suggested write-up: 'There is high confidence that age, race and ethnicity, socio-economic status and governance are significantly influenced by the outcome of past weather and climate extremes'. (Iqbal, Muhammad Mohsin, Global Change Impact Studies Centre)
966	TS	62	62	38	47	This statement also should reference Chapters 6 and 30. (UNITED STATES OF AMERICA)
967	TS	63	8	63	11	There are also tradeoffs and consequences to either a mitigation or adaptation strategy. They must be considered together. One or the other are not always a win-win. (UNITED STATES OF AMERICA)
968	TS	63	23	63	26	TS states it is impossible to attribute flooding to climate change. Chapter 25 states that stronger SSTs contributed to heavy rainfall during La Niña, suggesting a partial attribution.\n\n (NETHERLANDS)
969	TS	63	23	63	26	Perhaps an example that is not purely climatological would be more illustrative for WGII? Such as the effect of water management infrastructure on flood occurrence. (Stone, Dáithí, University of Cape Town)
970	TS	63	25	63	26	While some events, such as those noted for Australia may be triggered by ENSO/LaNina or other climate modal changes, not all flood events are. Extreme hurricane events/storm surge, rapid snowmelt also contribute to changes in flood patterns relevant to the observed past. (UNITED STATES OF AMERICA)
971	TS	63	25	63	26	More explanation is needed for this to make sense. It is not impossible in principle (otherwise we would not have been able to attribute observed global warming to emissions). (Stone, Dáithí, University of Cape Town)
972	TS	63	34	63	56	The FAQ2 11 and 12 are not really answered to in the text. (GERMANY)
973	TS	63	36	63	36	Average climate is not the critical issue. Biogeographic limits or inertia are often more related to frequency and magnitude of extreme events and threshold limits. (UNITED STATES OF AMERICA)
974	TS	63	39	63	39	I think it is important to show that crops can also fail following a change on seasonal patterns. See all the case studies and literature available for coffee and wheat. For example, many coffee growing areas have suffered drastic and subtle changes in the seasons (drought season has delayed or shortened or prolonged, for example). Quality coffee is very dependent on when it rains or not, a drought period is needed and has to coincide with specific timing for the plant. Chapter 7 mentions this but this is not reflected in this summary and is an important issue to highlight. In many of the countries adaptation strategies are being confused with disaster risk management and these issues of changes on seasonal patterns are not being considered. (Lacambra Segura, Carmen, Grupo La era)

#	Ch	From Page	From Line	To Page	To Line	Comment
975	TS	64	6	0	0	I cannot believe this is a frequently asked question! (Ingram, William, Met Office)
976	TS	64	25	64	31	Consider restating some of the climate opportunities and time frames. (UNITED STATES OF AMERICA)
977	TS	64	37	54	38	The second sentence is not fully consistent with FAQ 10. Please revise. (GERMANY)
978	TS	64	39	64	40	It is the same comment made for the Box CC-OA. The definition of ocean acidification is quite confusing. We would sugget: "... the uptake of CO2 into mildly alkaline ocean results in an increase in dissolved CO2 that combined with water reduces the pH, dissolved carbonate ion and the capacity ....."\n\n (NETHERLANDS)
979	TS	65	0	85	0	WGII Cross-Chapter Boxes: The idea of including of content from the cross chapter boxes in the TS is supported in principle, but copy/paste is not enough, inclusion of the X-boxes increases the volume/extent of the TS to a non-acceptable amount. The text should be significantly shortened, simplified and adapted in style the rest of the TS. Before inclusion in the TS, information from the underlying chapters should be shortened, references should point to the underlying report and not to the original literature. In addition, it is not possible that the same figures are shown twice in the TS (once as part of the main text, once within the X-chapter boxes.) (GERMANY)
980	TS	65	6	66	2	EBAs will be among the most common adaptation strategies, due to the compare relative low cost. To improve our knowledge and be able to properly inform decision makers it is also important to acknowledge the current limitations of EBAs, of the scientific evidence of EBAs and on information deficiencies to back up decision makers on EBAs. For references on this see the same reference Munroe et al 2011 that is being used in the box in this chapter. (Lacambra Segura, Carmen, Grupo La era)
981	TS	65	27	65	27	Missing the year of publication of Munang et al – should be Munang et al. (2013).\n\n (NETHERLANDS)
982	TS	65	33	65	45	Include some ecosystem-based approaches to adaptation such as: utilization of traditional knowledge is adaptive management approach. (Orcherton, Dan F., PACE-Pacific Centre for Envionment and Sustainable Development)
983	TS	67	0	0	0	Strongly support inclusion of Box CC-CR coral reefs. (AUSTRALIA)
984	TS	67	1	69	1	Box CC-CR. References to coral in the Chapter 25 should stress that this Box contains the most detailed and definitive information. \n\n (NETHERLANDS)
985	TS	67	4	67	10	Considering adding the following about corals: "Coral reefs are also extremely important from a biological point of view, for ecosystems and biodiversity in tropical waters, as home and/or nursery/foraging/spawning areas for a huge number of species". (NORWAY)
986	TS	67	6	67	6	Casual usage of “likely” should be avoided, as it is a reserved likelihood term. (Mach, Katharine, IPCC WGII TSU)
987	TS	67	16	67	16	Consider including at the end of the sentence "… and their associated ecosystems and species." (NORWAY)
988	TS	67	26	67	26	Line 26 states: '..and may tip the calcium carbonate balance of reef frameworks towards dissolution', with reference to Chapter 5.4.2.4. But this is not mentioned in Chapter 5.4.2.4, this information can be found in Cross-chapter box Coral Reefs. \n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
989	TS	67	30	67	36	This paragraph does not mention the impact of destructive fishing practices e.g. dynamite fishing. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
990	TS	67	31	67	31	Confusing statement: Around 50% of all coral reefs have experienced medium-high to very high impact of human activities (30-50% to 50-70% degraded). Suggest it be reworded to "medium-high (30-50% degraded) to very high (50-70% degraded)"\n\n (NETHERLANDS)
991	TS	67	45	67	46	The summary terms for evidence and agreement could be placed within parentheses at the end of this sentence to maximize directness of wording. (Mach, Katharine, IPCC WGII TSU)
992	TS	67	46	67	47	If it is possible to indicate the metric of “risk” as done for impact on lines 30-31, it would be great to do so. (Mach, Katharine, IPCC WGII TSU)
993	TS	67	49	67	52	What are the time frames for these projected outcomes? (Mach, Katharine, IPCC WGII TSU)
994	TS	67	67	23	23	Reference to Fig. 5X need to be updated with the appropriate figure reference. (UNITED STATES OF AMERICA)
995	TS	68	5	68	7	Given that the citations differ in year, it could be helpful to indicate more explicitly the timeframe for these statements. (Mach, Katharine, IPCC WGII TSU)
996	TS	68	8	68	8	The completed cross-reference should of course be supplied in the final draft. (Mach, Katharine, IPCC WGII TSU)
997	TS	68	21	68	23	It could be helpful to specify the relevant time frame for the statistics. (Mach, Katharine, IPCC WGII TSU)
998	TS	68	22	68	23	This is a good point, but appears to be a post hoc fact that is likely to apply to many other environmental assets around the world.\n\n (NETHERLANDS)
999	TS	68	25	68	23	Some reference to how relevant MPA remain in some areas given the larger scale impact of ocean acidification and bleaching might be pertinent here given that the opportunity cost of not taking other actions may need to be considered as well as any potential gain. E.g. if reefs really are set to disappear, buying time may or may not be the best option compared to diverting resources to dealing with the impacts of that scenario (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
1000	TS	68	31	68	31	“high confidence” should be italicized for clarity. Additionally, it could be placed within parentheses at the end of the sentence to maximize directness of wording. (Mach, Katharine, IPCC WGII TSU)
1001	TS	68	32	68	32	Of course the completed cross-reference should be supplied in the final draft. (Mach, Katharine, IPCC WGII TSU)
1002	TS	68	48	0	0	The Biggs 2011 reference mentioned in the text (at line 11) is missing from the reference list. (AUSTRALIA)
1003	TS	68	68	8	8	Reference to 13.x.x needs to be updated with the appropriate chapter reference. (UNITED STATES OF AMERICA)
1004	TS	68	68	32	32	Reference to 5.X.X needs to be updated with the appropriate chapter reference. (UNITED STATES OF AMERICA)
1005	TS	70	4	70	8	Box CC-RF: Are changes to water quality also important? (UNITED STATES OF AMERICA)
1006	TS	70	10	70	10	It would be preferable to use calibrated uncertainty language to summarize available evidence and agreement here. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
1007	TS	70	10	70	29	The paper by Doll and Zhang used results from the ECHAM5 model as well as HadCM3 and also the B2 emissions scenario. It's not clear whether these extra results are referred to. Perhaps they should be? Local change in hydrology will differ between models. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
1008	TS	70	15	70	15	Box CC-RF: 'suffer' is rather subjective. Perhaps degraded is a better term? (UNITED STATES OF AMERICA)
1009	TS	70	15	70	15	Which climate scenario? If possible, it would be preferable to specify this. (Mach, Katharine, IPCC WGII TSU)
1010	TS	70	17	70	19	Box CC-RF: Many hydropower, or operational systems of water impoundment have limits to their water holding capacity. Climate change may, through increased rain on snow events, exacerbate vulnerability to flood events. Also human activities upstream of an impoundment (clearcutting, etc) have significant impacts on riverine systems that are downstream. (UNITED STATES OF AMERICA)
1011	TS	70	28	70	28	Box CC-RF: Suggest presenting a suite of model results rather than a single model which may be viewed as an extreme result. (UNITED STATES OF AMERICA)
1012	TS	72	13	72	14	It is the same comment made for the Box CC-OA. The definition of ocean acidification is quite confusing. We would suggest: "... the uptake of CO2 into mildly alkaline ocean results in an increase in dissolved CO2 that combined with water reduces the pH, dissolved carbonate ion and the capacity ....."\n\n (NETHERLANDS)
1013	TS	72	32	72	32	Reference to Fig X.C.\n\n (NETHERLANDS)
1014	TS	72	32	72	32	Box CC-OA. There is a reference to a Figure X.C, that does not exist.\n\n (NETHERLANDS)
1015	TS	72	49	72	50	I strongly disagree with this statement as there have been only 2 modelling studies on the indirect food-web consequences of ocean acidification for fisheries. Therefore 'high agreement' would be meaningless. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1016	TS	72	51	72	52	It would be preferable to place the summary terms for evidence and agreement within parentheses to maximize directness of wording in the sentence. (Mach, Katharine, IPCC WGII TSU)
1017	TS	72	72	17	17	Reference to incorrect section. Change “5.3.3.6” to “5.3.3.5”. (UNITED STATES OF AMERICA)
1018	TS	72	74	1	17	There are several technical corrections that need to be made to Box CC-OA. These have been indicated in the reviews of chapters 30 and 6. (UNITED STATES OF AMERICA)
1019	TS	73	5	73	6	Box CC-OA: Temperature is probably a climatic driver. (UNITED STATES OF AMERICA)
1020	TS	73	12	73	13	Box CC-OA: Are economies also important (as well as ecosystem services)? (UNITED STATES OF AMERICA)
1021	TS	73	22	73	38	Box CC-OA: This section is largely repetitive. Perhaps weave estimated costs into relevant text. (UNITED STATES OF AMERICA)
1022	TS	73	28	73	31	The relevant scenarios of climate change should be specified for these projections. Importantly, instead of providing the results as “up to 13%” and “over 100 billion” the full ranges relevant to the analysis should be provided. Finally, the summary terms for evidence and agreement on line 30 should be italicized. (Mach, Katharine, IPCC WGII TSU)

#	Ch	From Page	From Line	To Page	To Line	Comment
1023	TS	73	32	73	33	I strongly disagree with this statement as there have been only 2 modelling studies on the indirect food-web consequences of ocean acidification for fisheries. Therefore 'high agreement' would be meaningless. I do not think it is possible to conclusively state that "ocean acidification will generally reduce fish biomass and catch" - there is some emerging evidence that the opposite might be true in certain areas. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1024	TS	73	36	73	36	It would be preferable to provide the ranges for these estimates. (Mach, Katharine, IPCC WGII TSU)
1025	TS	73	40	73	53	What about reducing other stressors, e.g. fishing, eutrophication, pollutants etc - so less vulnerable? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1026	TS	73	43	0	45	We suggest alternate wording: "Climate geoengineering techniques based on solar radiation management will not abate ocean acidification, and, in some cases, could increase it (Williamson and Turley, 2012)." (Mooney, Pat Roy, Action Group on Erosion, Technology and Concentration (ETC Group))
1027	TS	73	43	73	43	Mitigation of ocean acidification through reduction of atmospheric CO2 is mentioned as the most effective and least risky way method. But probably it is not the most cost effective\n\n (NETHERLANDS)
1028	TS	73	44	73	44	Box CC-OA: What about light limited processes in the ocean, such as NPP, etc? Changes to NPP impact ocean acidification. (UNITED STATES OF AMERICA)
1029	TS	73	49	73	49	The information given in this line cannot be found in Chapter 5.3.4.2 but in the Ocean Acidification Box (CC-OA)\n\n (NETHERLANDS)
1030	TS	74	4	74	17	Figure OA-1 (page 141) is almost identical to figure TS.9. (page 134). Is this duplication desirable, or necessary? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1031	TS	76	29	76	43	Figure RC-1 (page 142) is almost identical to figure TS.5. (page 120). Is this duplication desirable, or necessary? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1032	TS	76	45	77	5	Figure RC-2 (page 143) is almost identical to figure TS.5. (page 120). Is this duplication desirable, or necessary? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1033	TS	78	9	78	19	Please include the assessments results by the UN ESCAP/WMO Typhoon Committee Expert Team on the impacts of tropical cylclones and future projections of tropical cyclone activities in the western North Pacific basin. References : \n- Lee, T. C., T. R. Knutson, H. Kamahori, and, M. Ying, 2012a: Impacts of Climate Change on Tropical Cyclones in the Western North Pacific Basin. Part I : Past Observations. Tropical Cyclone Res. Rev. 1, 213-230. http://tcrr.typhoon.gov.cn/EN/abstract/abstract30.shtml\n- Ying, M., T. R. Knutson, H. Kamahori, and T. C. Lee, 2012: Impacts of Climate Change on Tropical Cyclones in the Western North Pacific Basin. Part II: Late 21st Century Projections. Tropical Cyclone Res. Rev. 1, 231-241. (Lee, Sai-ming, Hong Kong Observatory)
1034	TS	78	11	78	11	Box CC-TC: Please insert reference to Field et al., 2012 and spell out SREX first time the acronym is used. (UNITED STATES OF AMERICA)
1035	TS	78	19	0	0	The word "lower confidence" repeated twice. (Lee, Sai-ming, Hong Kong Observatory)
1036	TS	78	19	78	19	duplication of "lower confidence" (JAPAN)
1037	TS	78	19	78	19	The phrase lower confidence is repeatedly mentioned and one must be deleted.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
1038	TS	78	26	0	0	Could this vulnerability also have to do with infrastructure inadequate for protecting populated areas against severe storms? As per page 7, line 39 (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
1039	TS	80	8	0	0	The word 'modes' needs clarification, what type of modes? (Iqbal, Muhammad Mohsin, Global Change Impact Studies Centre)
1040	TS	80	47	80	47	Box CC-WE: Please also include Skaggs et al., 2012. For proper reference, see comment for page 81, lines 33,34 (UNITED STATES OF AMERICA)
1041	TS	81	33	81	34	Box CC-WE: This is referenced improperly and is the PNNL reference (which does not include the full list of authors), and in the wrong order. The correct citation is: Skaggs, R., Hibbard, K., Frumhoff, P., Lowry, T., Middleton, R., Pate, R., Tidwell, V., Arnold, J., Averyt, K., Janetos, A., Izaurralde, C., Rice, J., and S. Rose. 2012. Climate and energy-water-land system interactions. A technical report to the US Department of Energy in support of the National Climate Assessment. PNNL 21185. Pacific Northwest National Laboratory, Richland, WA. 152 pp. (UNITED STATES OF AMERICA)
1042	TS	82	14	82	16	Box CC-VW: This sentence implies that Leakey et al., 2009 discussed spatial encroachment (presumably on landscapes) with FACE results which is not true. Expansion of species into new habitates does not always lead to increased Ts rates. (UNITED STATES OF AMERICA)
1043	TS	82	18	82	23	Box CC-VW: For the TS, only the most recent results should be presented. As a result, the authors can delete lines 19-21, simply stating that "Since AR4, recent studies (e.g., Dai et al…) show that…" (UNITED STATES OF AMERICA)
1044	TS	82	45	82	46	the anthropogenic component of the precipitation and temperature contributions(i.e. of the radiative CO2 effect) to runoff trends is not yet established doesn't actually make sense, but also seems to imply that it is possible in principle to establish a precise anthropogenic contribution to climate change, which is of course untrue. (Ingram, William, Met Office)
1045	TS	82	53	0	0	although other models project a smaller response makes no sense as no magnitude has been mentioned (Ingram, William, Met Office)
1046	TS	83	1	83	9	Box CC-VW: Anything on downregulation? (UNITED STATES OF AMERICA)
1047	TS	83	11	0	0	This paragraph refers to interactive effects of drying and plant cover, but not altered precipitation regimes and plant cover that may be more applicable to temperate systems- for instance work from the Konza Prairie LTER long term rain fall experimental plots could be cited if published http://www.konza.ksu.edu/knz/pages/research/knzcore.aspx (Gutknecht, Jessica, Helmholtz Centre for Environmental Research-UFZ)
1048	TS	83	16	83	17	There is no reference in the Chapter to Green et al 2007. It could be inserted e.g. P13 L33-38.\n\n (NETHERLANDS)
1049	TS	83	32	83	32	Box CC-VW: These systems are probably less synchronous than we think. Probably more like lagged effects as indicated earlier in this summary. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
1050	TS	85	0	86	0	TABLE TS.1 there are several blank cells in the table; could they be populated with examples? Especially for Small Island state row; SIS are accepted as farily vulnerable, but few observed impacts are recorded here. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1051	TS	86	0	0	0	Table TS1 - Mass coral bleaching has also been recorded on Western Australia's Ningaloo and Abrolhos Island fringing reefs. Sources: Australian Institute of Marine Science - Ningaloo Atlas: http://ningaloo-atlas.org.au/node/193 & 2011 SOE report card: Anthony K, Harrison P, Lough J, Brinkman R, Oliver J and Wachenfeld D. Australia's coral reefs in a changing ocean. Report prepared for the Australian Government Department of Sustainability, Environment, Water, Population and Communities on behalf of the State of the Environment 2011 Committee. Canberra: DSEWPaC, 2011. (AUSTRALIA)
1052	TS	86	0	0	0	Table TS 1: There is no entry for climate impacts on Africa marine and coastal systems. Coral bleaching linked to El Nino, redistribution of fish stocks and abundance, could perhaps feature here if only in terms of ENSO linkage? (Bunce, Matthew, Institute of Marine Engineering, Science and Technology)
1053	TS	86	0	0	0	Table TS.5.: The table could be revised to provide the better understanding the relationship between the risks and adaptation issues discussed herein and temperature increased. (JAPAN)
1054	TS	86	0	0	0	Given the vast geographical coverage of Asia and hence the diversity of Asian subregions, examples for Asia should be provided for each sub-region when available. (JAPAN)
1055	TS	86	0	0	0	Table TS.1, bottom row: The first sentence of the coastal and marine system cell needs to be replaced by "Mass bleaching of corals in Great Barrier Reef, changes in coral calcification rates (high confidence), and changes in coral disease dynamics (medium confidence)". \n\n (NETHERLANDS)
1056	TS	86	0	0	0	Table TS.1, bottom row: snow depth actually declined at three out of four sites, not all four sites. Confidence for this is high, not medium.\n\n (NETHERLANDS)
1057	TS	86	0	0	0	Table TS.1, bottom row: The categories used to analyse changes in the Chapter 25 are different to those used here (Chapter: morphology, geographic distribution, life cycles, marine productivity, vegetation change, freshwater communities, disease, coral reefs; TS: genetics, growth distribution, & phenology)\n\n (NETHERLANDS)
1058	TS	86	0	0	0	Table TS.1, bottom row: : Chapter 25 also cites decreases in fish growth rates (see page 88); TS cites only increasing fish growth rates (like Table 18.8)\n\n (NETHERLANDS)
1059	TS	86	0	0	0	For Table TS.1 in "Europe - Coastal & Marine Systems", Chapter 30.6.2.1.3 also support these points.\n\n\n (NETHERLANDS)
1060	TS	86	0	0	0	Table TS.1 Comment - Does this table make any attempt to attribute what component of change is respon;sible for the impact? Changes in precipitation quality, rain /snow, temperature versus changes in snowpack for glacier retreat, etc? (UNITED STATES OF AMERICA)
1061	TS	86	0	0	0	Table TS 1: Please state what is the time period for those observations. (NORWAY)

#	Ch	From Page	From Line	To Page	To Line	Comment
1062	TS	86	0	0	0	Under Asia second column. " Shrinking mountain glaciers across Asia. Increase runoff in many rivers due to shrinking glaciers in the Himalayas & Central Asia".\nComments. We should be careful about this statement, because glaciers in the Western Himalayas are presently not being impacted much from global warming. Similarly, the river flows in the Indus-River has also not been observed increasing because of shrinking glaciers.\n\n (Chaudhry, Qamar uz Zaman, Ministry of Climate Change Government of Pakistan)
1063	TS	86	0	86	0	No Asian examples are provided for food production systems and food security. A suggested addition is: "In Japan, where mean air temperature has risen at 1.15 degrees Celsius per the past 100 years, effects of recent warming in agriculture clearly exist (Chapter 24 Page 23 lines 29-35)" (JAPAN)
1064	TS	86	0	86	0	Table TS. 1, in the 'Europe' section on 'Coastal and Marine' the information on cod and eelpout seems very specific, given the high-level nature of the document. The shift in cod distribution (given a high confidence score) is actually quite controversial, and there is much argument about whether the shift is due to climate or depletion by the fishery. There is huge literature base on European fish distribution shifts, so the inclusion of these specific studies seems very narrow. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1065	TS	86	0	87	0	Table TS.1: Please see our comments on Table SPM.1. (GERMANY)
1066	TS	87	0	0	0	Table TS.1. Please, to consider if section 26.4.2 could be removed from references in Terrestrial Ecosystems, Drought, & Wildfire section. Despite that in this section is clear that distribution of cold and hot water fish (page 17, line 52-53), and that the abundance and productivity of Salmon (pages 18, 28-29) are changing by climate change. There are no studies that support strongly "the shifts in the species distribution in northward latitude for these taxa". \n\n (NETHERLANDS)
1067	TS	87	0	0	0	In Table TS 1. Region: Polar Regions: 'Impact on livelihoods of Arctic indigenous peoples' [18.4.5, Box 18-5] is mentioned in the last column with title 'Human Systems'. This reference indication is however incorrect and should be [18.4.7, Table 18-5] instead of [18.4.5, Box 18-5], since there is no mention of impact on livelihoods of Arctic indigenous peoples in section 18.4.5 (this should be section 18.4.7) and Box 18-5 discusses how indigenous Arctic peoples perceive climate change impacts and does not specifically address the impacts of climate change on their livelihoods (see Table 18-5 for this, at page 85 of chapter 18). \n\n (NETHERLANDS)
1068	TS	87	0	0	0	Table TS1 row8 col5: add ", dengue and yellow fever" to the sentence " increase in frequency and extension of malaria"\n\n (NETHERLANDS)
1069	TS	87	0	0	0	Table TS1. page 2, line 3 (Polar regions), column 2: table mentions that lakes will be created in areas of formerly frozen peat. This is not correct. Instead of frozen peat, should be frozen ground (or permafrost). Similar problem to SPM1 table (Vieira, Goncalo, University of Lisbon)
1070	TS	87	0	87	0	In Table TS.1, the term "foraminifera shells" should be replaced with a formal academic term "foraminiferal shells". (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
1071	TS	88	0	0	0	Table TS.2: 1) It seems more logical to change the order of the columns Meteorology and IMPACTS. 2) The impact of the 2003 heat wave (hot summer) in Europe is stated with 70,000 excess deaths. In Table 23-5 in chapter 23 (Europe), page 87 in comparison there are stated 35,000 deaths for the same 2003 summer. These statements have to be coherent. 3) It is not clear, if the confidence statement relates to the statement itself or to the extreme event's / anthropogenic contribution to the statement. (GERMANY)
1072	TS	88	0	0	0	Table TS.2 Comment - Suggest including hurricanes Sandy, Katrina, Mississippi floods, midwest drought in 2011, 2012. (UNITED STATES OF AMERICA)
1073	TS	88	0	0	0	Table TS.2: As the person responsible for the compilation of this table in Ch18, I am a bit surprised to see it featured in the TS. Within the chapter the table is given as a possibly bold but defensible example of where research into the risk of impacts from extreme events is potentially heading; I hope it comes across that way. We have indeed included confidence assessments, but again this is included more as an example of what can be done rather than a definitive across-the-board assessment; for instance think of all of the events we have not included and the selection issues involved. As a reader, the presence of this table in the TS implies to me that the content is systematic and representative of the impact role of extreme weather events and their link to climate change (I know the caption starts with “illustrative”, but still). It may or may not be representative but it is definitely not systematic: the protocol for selection depends explicitly on using occurrence of the weather event and of severe associated damage as evidence. (Stone, Dáithí, University of Cape Town)
1074	TS	88	0	0	0	2010 –Pakistan . Last column: (Confidence in contribution of anthropogenic emissions to extreme weather event. “ very low”. This should be either” medium or low” instead of very low. Third column- Impact/damage- Total loss be 10 US$ billion instead of 40 US$ billion. (Chaudhry, Qamar uz Zaman, Ministry of Climate Change Government of Pakistan)
1075	TS	89	0	0	0	Table TS.3.: In the Early Warning Systems for Heat table, the Description box should also include Asia in the last line, "Warning systems for heat waves have in used in..." as they have been developed in Asia as well - for example, in the Sarawak river system as herein discussed (Chapter 24 page 11 line 14). (JAPAN)
1076	TS	89	0	0	0	Table TS.3 lists no adaptation practice arising from Asia. Considering the fact that Asia is vulnerable to climate change, it is suggested to add Asian cases on adaptation practice taking into account relevant chapters, such as Chapter 24. (CHINA)
1077	TS	89	0	0	0	from the chapter, 11.3.2 covers current health status but it is mentioned in the TS in relation to cyclones.\n\n (NETHERLANDS)
1078	TS	89	0	0	0	Table TS.3. Third row. There is no discussion in the Chapter of an observed increase in heat waves or warm spells, except for a reference to AR4. Perhaps the discussion of temperature extremes needs to be joined or aligned with heat waves.\n\n (NETHERLANDS)
1079	TS	89	0	0	0	Table TS.3 Fourth row. Not clear what the evidence is that warning systems for heat waves have been used in Australia. There are references to a Heat Health alert system and to attention being given to developing early warning plans; these don't seem exactly the same as "have been used"\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
1080	TS	89	0	0	0	Table TS.3 Comment - The last bullet in broader context is confusing - what are "mangrove bioshields?" It would be useful if this example also included mention of the multiple benefits provided by mangrove ecosystems (in addition to coastal proection) - such as habitat for juvenile fishes, etc. (UNITED STATES OF AMERICA)
1081	TS	89	0	0	0	Table TS.3 Comment - The text and the table are redundant. The table is too long and might only have value through the use of hyper links. (UNITED STATES OF AMERICA)
1082	TS	89	0	93	0	Table TS.3: Please see our comments on Table SPM.2. (GERMANY)
1083	TS	90	0	0	0	Under the BROADER CONTEXT this statement 'Mangrove bioshields created from exotic species can detrimentally impact native ecosystems.' is contradictory with 29.7.2 (page 29 line 12 to 13).\n\n (NETHERLANDS)
1084	TS	90	0	0	0	Table TS.3 Comment - Community-based adaptation—Climate information at the global scale. The number of intense tropical cyclones may have already increased within the last several decades and is likely to increase further in the future (UNITED STATES OF AMERICA)
1085	TS	90	0	90	0	Table TS.3: Mangrove restoration to reduce flood risks and protect shorelines from storm surge: CLIMATE INFORMATION AT THE REGIONAL SCALE: Projected: \nAND\nTable TS.3: Community-based adaptation and traditional practices in small island contexts: CLIMATE INFORMATION AT THE REGIONAL SCALE: Projected: \n"In the North Atlantic and the EASTERN part of the North Pacific, the frequency of category 4/5 tropical cyclones is projected to increase" should be "In the North Atlantic and the WESTERN part of the North Pacific, the frequency of category 4/5 tropical cyclones is projected to increase." According to Box.14.2 Figure 1 (p. 14-191) and Figure TS.19 (p. TS-98) of WG1 SOD, projected changes in Category 4-5 TC frequency is assessed for Global, North Atlantic and Western North Pacific, and not for Eastern North Pacific due to insufficient data. (JAPAN)
1086	TS	92	0	92	0	For the insurance scheme, incentives for reducing risk are mentioned: while this is true theoretically, in practice these have not really been shown to be important and working. As risk reduction is crucial, I would put a caveat, such as 'theoretically" in here, and also mention this under challenges. (Mechler, Reinhard, INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS)
1087	TS	93	0	0	0	Table TS-3: On Page 93 in the section of the table headed "Climate information at the regional scale" an observed "Mean temperature invcrease of 0.9°C per decade over Australia since 1911" is reported. I assume this number should be 0.09°C per decade ? (I'm pretty sure that Australia has not warmed by 9°C degrees total over the past century!). (Wratt, David, NIWA, New Zealand)
1088	TS	93	0	0	0	Table TS.3 In the section "Relocation of agriculture industries in Australia" of Table SPM.2, under projected sub-heading, fifth sentenced needs to be changed as follows: Increase in intensity of rare daily rainfall extremes (high confidence) and of short duration (sub-daily) extremes (medium confidence) in Australia and New Zealand" (see Table 25-1, 25.5.1).\n\n (NETHERLANDS)
1089	TS	93	0	0	0	Table TS.3 In the section "Relocation of agriculture industries in Australia" of Table TS.3, level of confidence (high) needs to be added at the sentence beginning "Freshwater resources..."\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
1090	TS	93	0	0	0	Table TS.3 Observed temperature change should be 0.09 degrees per decade, not 0.9\n\n (NETHERLANDS)
1091	TS	93	0	0	0	Table TS.3 Inconsistency in baseline timeframes reported i.e. it is in some cases (e.g. since 1911) but not in others (e.g. for cool extremes the timeframe is since 1950, but this is not cited)\n\n (NETHERLANDS)
1092	TS	93	0	0	0	Table TS.3 Re: observed heavy precipitation trends, theTS neglects to mention trends that are mixed or not significant; these are reported in the Chapter 25\n\n (NETHERLANDS)
1093	TS	93	0	0	0	Table TS.3 RE: projected extreme rainfall: not all measures of extreme rainfall from Chapter 25 are reported here in TS\n\n (NETHERLANDS)
1094	TS	93	0	0	0	Table TS.3 Re: freshwater resources, SPM states "highly populated southeast", Chapter 25 states "far southeast"\n\n (NETHERLANDS)
1095	TS	93	0	0	0	Table TS.3 Comment - Freshwater resources entry (under Regional Climate Information) is missing a confidence statement. (UNITED STATES OF AMERICA)
1096	TS	94	0	0	0	Table TS.4. In Adaptation/Social/Educational section, after 'awareness raising' add "and specific guidance" (Ronan, Kevin, CQUniversity Australia)
1097	TS	94	0	0	0	Table TS.4. In Transformation/Spheres of change/Personal after 'responses.' add "Educate children." (Ronan, Kevin, CQUniversity Australia)
1098	TS	94	0	0	0	Table TS.4: See our comments on Table SPM.3. (GERMANY)
1099	TS	94	0	0	0	If the concepts of the ecosystem management approach and ecosystem based approach are different, the clarification is necessary. If not, the terms should be unified. (JAPAN)
1100	TS	94	0	0	0	Block Transformation. Note that the idea of steering transformations that take place in these spheres of change (pratical, political, personal) is based on 1 source (O'Brien and Sygna, forthcoming) according to p. 24 of Chapter 20 and fig 20-2.\n\n (NETHERLANDS)
1101	TS	94	0	0	0	Table TS.4 Comment - What does: "low regrets options to reduce structural inequalities" mean?; Insurance schemes sounds sinister. Are maintaining wetlands, etc the only ecosystem management options? What about forests, rangelands, etc?; Are brushfire fuel reductions as important as forest fuel reduction?; What is a social safety net? (UNITED STATES OF AMERICA)
1102	TS	94	0	94	0	Table TS.4\n"River improvement works, construction of reservoirs, enhancement of flood projection technique, promotion of safer ways of residing, retention of rain water run off, construction of drainage pumping stations" and "Amount of future sea level rise should be incorporated when renewing coastal facilities" should be added in appropriate lines.\n (JAPAN)
1103	TS	95	0	0	0	Table TS.5: Please see our comments on Table SPM.4. Within the box risk/human system/global right at the bottom "reduction of disease-carrying vectors" should be deleted, since this pronouncement cannot be found in chapter 11.5. as such. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
1104	TS	95	0	0	0	See the box about cross-sectoral risks, region: global, first paragraph). It says that between 20-60% of the physical impacts can be potentially avoided. In the body of the chapter, though, different percentages for avoided impacts are mentioned (from 20-70%, or 30-80%, etc.) Chapter 19, page 47, lines 36-41. It is not clear why in the summary 60% is chosen as the maximum value for avoided impacts. When generalizing, one should take the extreme values, in this case 20% and 80%, to indicate potential avoidment of impacts.\n\n (NETHERLANDS)
1105	TS	95	0	0	0	Table TS.5 Comment - This table is not only egregiously long, but it adds little value. We suggest removing this table. Additionally, the invocation of "era of climate responsibility" and "era of climate options" are new terms that are neither intuitive nor clear. Also, "climate drivers" typically do not go beyond GHG and other forcers. How is precipitation or sea level a "climate driver"? (UNITED STATES OF AMERICA)
1106	TS	95	0	0	0	Table TS 5: Good table, but somewhat difficult to grasp.It is particularly hard to understand why there are sometimes four columns (2 +2) and sometimes only two. When only two: are we lacking information for the other period? Please clarify. (NORWAY)
1107	TS	95	0	99	0	TABLE TS.5 'the era and adaptation potential column uses graphics to communicate the level of risk and adaptaiton potential and severity of CC over time. I found I had to repeatedly x-ref to the legend to understand the meaning, since they are not especially accessible. Given this, it might be better to alter the graphics or accept that x-reference is needed and replace thegraphics with simpler, more distinct symbols which are easier to discern from each other. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1108	TS	95	0	101	0	Table TS5 - It is not clear why some rows show two 'Era and adaptation' graphs and some only show one. (AUSTRALIA)
1109	TS	95	0	101	0	Table TS.5\nIn this table, more other "Climate Drivers" which cause remarkable current and potential comprehensive risks should be listed as the remarkable "Climate Drivers" in each region, in order to avoid misunderstandings by the Policy Makers that existing current serious risks and increasing risks are negligible or alleviated as the result of future climate change without considering positive impacts by the drivers.\nFor example, freshwater resources and systems in Asia are significantly vulnerable to tropical cyclones and the future change of intensity and frequency of them, however, only temperature is listed as "Climate Drivers" in the corresponding column in page 25. [Risks - Coastal and Marine systems are significant vulnerable not only to Sea level but also to the cyclones.] (JAPAN)
1110	TS	95	0	101	0	Table TS.5.: There is far too little discussion of Asia in the table as a whole. Given the vast geographic and climatic diversity of the Asian continent, it can not be represented by one single example and therefore, examples representing each subregion should be provided where possible. (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
1111	TS	96	0	0	0	Table TS.5.: The single Central Asian example provided as a regional example of risks for freshwater resources and systems is insufficient to represent the vast diversity of the Asian continent. Suggested additions representing the various subregions are: "Throughout much of Russia, a warmer climate would decrease water availability due to the increase in evaporation but on the other hand precipitation would increase which tends to increase water availability)." (Chapter 24 page 10 lines 19-22); "In China, a projection (A2, PRECIS) suggests that there will be insufficient water for agriculture in the 2020s and 2040s due to the increases in water demand for non-agricultural uses, although positive trends in precipitation may occur in some areas."; and "In a study of the Mahanandi River Basin in India, the future water availability projection (A2, CGCM2) indicated an escalating trend in excess river runoff (runoff after meeting water demand), thereby increasing the future possibility of floods for the month of September, yet the outcomes for April indicate an accelerating water scarcity." (JAPAN)
1112	TS	96	0	0	0	Table TS.5 - Risks - Freshwater resources and systems - Europe: "Climate change is likely to further increase coastal and river flood risk", ok for coastal flood risk, but river flood risk is equally or more determined by "changes in population and economic growth" (see Ch.23 p.13 lines 8-10) and "no causal role for climate" was mentioned in Table 23-6 (p.89)\n\n (NETHERLANDS)
1113	TS	96	0	0	0	Table TS.5 - Risks - Freshwater resources and systems - Europe: reference to section 23.8.3, but in that section no mention of water or flooding. Reference should be removed?\n\n (NETHERLANDS)
1114	TS	96	0	96	0	For Asia, "Increases in frequency and intensity of torrential rainfall, an increase in number of dry days, a decrease in maximum snow depth, increases of flood scale and frequency are projected." should be mentioned. (JAPAN)
1115	TS	97	0	0	0	Table TS.5 - Risks - Terrestrial ecosystems, drought & wildfire - Europe: "wildfires in Southern Europe (high confidence)", section 23.4.4 mentions that changes in fire occurrence are "often difficult to precisely quantify" (Ch.23 p.23 line 8), change to "medium confidence"?\n\n (NETHERLANDS)
1116	TS	97	0	0	0	Table TS.5 - Risks - Terrestrial ecosystems, drought & wildfire - Europe: "and from storms (low confidence)", section 23.4.4 mentions impact of storms only in Central Europe (Ch.23 p.23 lines 18-25), change to "and from storms in Central Europe (low confidence)"?\n\n (NETHERLANDS)
1117	TS	97	0	0	0	Table TS.3 Australasia row, states endemic species are a risk of extinction but we find no reference to this, only that native species face this risk. There is reference to "local species extinctions" but we don't think this is necessarily the same thing. It is ambiguous, could mean extinction in a localised area.\n\n (NETHERLANDS)
1118	TS	97	0	0	0	Table TS.5 In the table under Australasia, fire weather has been interpreted as wildfire - and we don't think they are the same thing? XX\n\n (NETHERLANDS)
1119	TS	97	0	97	0	For Asia, "Decreases of drought river discharges and river discharge are projected." should be added. (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
1120	TS	98	0	0	0	First row in the table. The sentence states the following: '..direct global cost of coastal flooding may reach 300 US$ billion per year in 2100 without adaptation and 90 US$ billion per year with adaptation under a 1.26 m sea-level rise scenario'. In Chapter 5 these amounts (90 billion, 300 billion) are only mentioned with respect to a sea level rise of 0.6 to 1.3 m (see Table 5.8) and thus not '1.26 m'. Next to the fact that the 1.26 is mentioned in another perspective (cost estimation only for Africa), the bold statement made in the TS is only based on one reference, while Table 5.8 shows the broad ranges in cost estimates if also e.g. submergence is taken into account. It seems therefore innapropriate to state only the numbers 90/300 billion. Suggestion: include the broad cost estimations, taking into consideration more impacts of sea-level rise.\n\n (NETHERLANDS)
1121	TS	98	0	0	0	Second row in the table. The sentence states: 'While developed countries are expected to be able to adapt to even high levels of sea-level rise...'. This information cannot be found in Section 5.4.3 of 5.5.3 or anywhere else in Chapter 5. Nowhere it is stated that developed countries are expected to be able to deal with high sea level rises.\n\n (NETHERLANDS)
1122	TS	98	0	0	0	For Table TS.5: Chapter 30.6.6 and Figure 30-15 should be added as the source as well for Global point “Changes in ocean mixing….”\n\n (NETHERLANDS)
1123	TS	98	0	0	0	Table TS.5, Under "Coastal and marine systems" - 6th row under "global", 2nd column ("risks"): Please explain how can deoxygenation of deep waters and spread of hypoxic zones be positive for some fisheries. (NORWAY)
1124	TS	98	0	98	0	Coastal systems: no information about Latin America and Caribbean region (Lacambra Segura, Carmen, Grupo La era)
1125	TS	99	0	0	0	Table TS.5.: The box for "Asia" under "RISKS: COASTAL & MARINE SYSTEMS" discusses only the Arctic region while the text highlights the impacts of coastal flooding. Therefore, it is suggested that the following risk is added to the table: "By 2100, without adaptation, the majority of people projected to be affected by coastal flooding and displaced due to inundation and erosion will be in East, Southeast, and South Asia [5.4.3.1]." (JAPAN)
1126	TS	99	0	0	0	Table TS.5.: The single Asian Arctic example provided as a regional example of risks for coastal and marine systems is insufficient to represent the vast diversity of the Asian continent. Considering the importance of Asia, in terms of its dominating the global production of food from both capture fisheries and aquaculture, and the highlight on coastal flooding in Chapter 5, more examples should be introduced from Asia. Suggested additions representing the various subregions are: "Sea-level rise is expected to impact both capture fisheries and aquaculture production in river deltas." (Chapter 24 page 27 lines 14-15); "For marine capture fisheries, climate change may lead to a massive redistribution of fisheries catch potential, with large increases in high-latitude regions, including Asian Russia, and large declines in the tropics, particularly Indonesia." (Chapter 24 page 27 lines 15-19); "By 2100, without adaptation, the majority of people projected to be affected by coastal flooding and displaced due to inundation and erosion will be in East, Southeast, and South Asia." (Chapter 5 page 3 lines 23-25) (JAPAN)

#	Ch	From Page	From Line	To Page	To Line	Comment
1127	TS	99	0	0	0	Table TS.5 Under Australasia, there is a misinterpretation of text: the original text says evidence is limited about the ability of reefs to respond to CC, but the claim is that a reef's ability to respond is limited. \n\n (NETHERLANDS)
1128	TS	99	0	0	0	For Table TS.5: Box CC-OA should be added as the source as well for Australasia point “Significant change…”\n\n (NETHERLANDS)
1129	TS	99	0	0	0	Table TS.5 Comment - Coastal and Marine Systems. Region: Australasia. Risks from sea level rise very likely continuing beyond 2100 even with temperature stabalization is true globally, not just for this region. (UNITED STATES OF AMERICA)
1130	TS	99	0	0	0	Table TS.5 Comment - Coastal and Marine Systems: Asia-Arctic. The statement about sea level rise and coastal erosion is probably true as well for the Arctic coasts of Alaska and Canada (UNITED STATES OF AMERICA)
1131	TS	99	0	0	0	Table TS.5 Comment - Coastal and Marine Systems: Austalasia. The statement on managed retreat also applies globally. (UNITED STATES OF AMERICA)
1132	TS	99	0	99	0	Table TS.5, first cell. I question the general validity of this statement, even if restricted to Europe: "Climate Change will not entail relocation of fishing fleets (high confidence)". (same statement as on page 40). (Ottersen, Geir, Institute of Marine Research)
1133	TS	99	0	99	0	For Asia, "Increases in the magnitudes of severe storm surge anomalies, and increases of extreme wave heights are projected." should be mentioned. (JAPAN)
1134	TS	99	0	99	0	Table TS. 5, in the 'Europe' section. I strongly disagree that climate change will not entail "relocation of fishing fleets" as this would be very context specific and in certain parts of Europe we are seeing some changes in fleet behaviour/location to make the most of new opportunities (e.g. in the UK). Perhaps "not necessarily entail relocation" would be better. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1135	TS	100	0	0	0	Table TS 5.: The box for "Asia" under "RISKS: HUMAN SYSTEMS" should also include the projected impacts on food production as a result of saltwater intrusion, especially in deltas. (JAPAN)
1136	TS	100	0	0	0	Table TS.5 - Risks - Human systems - Europe: "Climate change will increase problems associated with overheating in domestic housing", no confidence level given (see Ch.23 p.3 line 43)\n\n (NETHERLANDS)
1137	TS	100	0	0	0	Table TS.5 - Risks - Human systems - Europe: "but decrease cereal yields in Southern Europe", in Ch.23 p.18 line 30 speaks of yield loss in general, not only cereals\n\n (NETHERLANDS)
1138	TS	100	0	0	0	Table TS.5 - Risks - Human systems - Europe: "Climate change will inhibit thermal power production during summer", word "inhibit" is too strong, should be "decrease", Ch.23 p.15 line 28-30 mentions a "6-19% decrease of the summer average usable capacity of power plants" and "lower figures have also been estimated"\n\n (NETHERLANDS)
1139	TS	100	0	0	0	Table TS.5 - Risks - Human systems - Europe: "Increasing damage of cultural buildings and loss of cultural landscapes across most sub-regions by 2050 (medium emissions)", 2050 and medium emissions not mentioned in section 23.5.4 or Table 23-5\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
1140	TS	100	0	0	0	Table TS.5 - Risks - Human systems - Europe: Reference to Table 23-5 not correct, should be Table 23-4?\n\n (NETHERLANDS)
1141	TS	100	0	0	0	Table TS.5 - Risks - Human systems - Europe: "... Including buildings, local industries, landscapes, and iconic places such as Venice": Section 23.5.4, page 28 line 35, states that Venice previously was vulnerable to flooding, but that adaptation measures have now been taken and that the frequency of storm surges may decrease, so that now the climate change impact on Venice is estimated to be smaller, suggest to skip the reference to Venice.\n\n (NETHERLANDS)
1142	TS	100	0	101	0	Table TS.5.: Asia should preferably been presented in subregions, representing the diverse geographical and climatic features of the vast continent. Suggested additions for risks in human systems to represent the various subregions are: "Climate change is expected to impact water resources, and thus the viability of agricultural livelihoods in the Asian region in a major way. Diminishing Himalayan glaciers would impact the agricultural water supply and food security of more than one billion people in Asia." (Chapter 9 page 9 lines 48 to page10 line 3); "Many Asian countries are major tourist destinations and more studies are needed to understand the impact of climate change on tourism. With respect to beach tourism, large developing countries and small islands states may be among the most vulnerable due to high exposure and low adaptive capacity. A number of Asian countries were found vulnerable in this regard." (Chapter 24 page 31 lines 53, page 32 line 2) (JAPAN)
1143	TS	101	0	0	0	Table TS 5 - Risk - Human Systems Polar Regions section - Is reference being made to thawing permafrost here as well as loss of sea ice? Revise sentence "...where sea ice loss and thawing permafrost disrupt transportation...." (Smith, Sharon, Geological Survey of Canada)
1144	TS	101	0	0	0	Table TS.5 Australasia row, reference to "food production" seems a little alarmist because we can only find reference to the effects of water availability on "agriculture production" which includes animal and human food production, fibre, biofuel production, etc.\n\n (NETHERLANDS)
1145	TS	101	0	0	0	Table TS.5, 2nd row under "Polar regions" in the first column, 2nd column ("risks"): exchange "hunting" with "ice dependent" to generate "… ice dependent marine mammals." since this statement is true for more species than polar bears. (NORWAY)
1146	TS	101	0	101	0	Central and South America. The cell with adaptation issues and prospects is empty. Similar general comments as in the other regions can be added, such as adequate watershed management, water management at the household level to diminish the risk of dengue etc (Lacambra Segura, Carmen, Grupo La era)

#	Ch	From Page	From Line	To Page	To Line	Comment
1147	TS	102	0	0	0	Table TS.6: The caption should state that these are projections. Uncertainty information must be added to each statement, maybe add little stars to the arrows with the number of stars indicating the confidence level. In addition, please improve the caption, explain "medium emissions" in terms of RCP, the second line is incomprehensible (What does "No further planned adaptation" mean, is there any adaptation considered?). The arrows should be explained above the table as part of the caption, and be smaller. Why does this table state that there is "no relevant literature found" for air quality? Maybe you mean that the literature is inconclusive, because there is a wealth of studies on this topic. Please revise. (GERMANY)
1148	TS	102	0	0	0	Table TS.6 Comment - This table is too subjective and distracting. Additionally, the footnote explicitly states that "no relevant literature found"(!). It is difficult to understand how something of this nature can be included with such prominence in the report. (UNITED STATES OF AMERICA)
1149	TS	102	0	104	0	Tables have been inserted from Chapters 23 and 25. Important tables from other regional chapters should also be introduced in the TS as well. (JAPAN)
1150	TS	104	0	0	0	Table TS.7: In the current form, this table is not very useful: It looks pretty with all the colors and little pictograms, but there is too much information in this table, and the text is too small. Information on how risk has been assessed and uncertainty MUST be indicated for each statement. The ample-colored bars should become greener towards the bottom of the table, but are not really - there seems to be a conceptual problem. The explanation on the horizontal/thick bars is unclear. It is not really clear why the forth row shows pairs of colors bars. Please use yellow/red colors not rainbow for the risk scale as in the RFC figure. (GERMANY)
1151	TS	104	0	0	0	Table TS.7. Top row, last column. Not clear what the evidence is for (lack of) genetic adaptation in corals\n\n (NETHERLANDS)
1152	TS	104	0	0	0	Table TS.7. Top row, last column. TS does not mention options from Chapter 25: translocation, shading, forecasting\n\n (NETHERLANDS)
1153	TS	104	0	0	0	Table TS.7. Second row, last column. Text makes it sound as if predator control is a stress. Reword to "pests and diseases, predator control and". \n\n (NETHERLANDS)
1154	TS	104	0	0	0	Table TS.7. Third row, last column. Not clear what the evidence is for trade-offs between different (wildfire) management objectives and settlement patterns and goals\n\n (NETHERLANDS)
1155	TS	104	0	0	0	Table TS.7. Fourth row, last column. "Unlimited water demand" might be misleading. Suggest rewording to "very high water demand" or similar.\n\n (NETHERLANDS)
1156	TS	104	0	0	0	Table TS.7. Fifth row, last column. Not clear what the evidence is for transport and power infrastructure already being at coping limit in many regions, or that there are significant financial costs from future upgrades. \n\n (NETHERLANDS)
1157	TS	104	0	0	0	Table TS.7. Sixth row, last column. TS states "protection and accommodation of increased risk". Chapter states "re-balancing protection from and accommodation or avoidance of flood risk"\n\n (NETHERLANDS)
1158	TS	104	0	0	0	Table TS.7 contains text from other areas which have inconsistencies, as noted in other comments\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
1159	TS	104	0	0	0	Table TS.7. This is a very complex figure, particularly the narrow/thick/multiple horizontal bars. \n\n (NETHERLANDS)
1160	TS	104	0	0	0	Table TS.7. It is possibly confusing to refer to very high risk in fully adapted state. Suggest clearly stating what the hypothetical fully adapted state refers to. It is tempting to interpret it as 'risks reduced to very low'.\n\n (NETHERLANDS)
1161	TS	104	0	0	0	Table TS.7 Comment - (Aus & NZ): Seems repetetive with Table TS.5 (All Regions). Suggest a merger of tables. Is the term "key" here used as it is in Chapter 19 (i.e., caused by an anthropogenic change)? The TS needs to be consistent with the underlying chapters. (UNITED STATES OF AMERICA)
1162	TS	104	0	0	0	Table TS.7: Very good and intuitive table, much easier to understand and follow than Tables TS.5 and 6. (NORWAY)
1163	TS	105	0	0	0	Table TS.8: Please see our comments on Table SPM.5. (GERMANY)
1164	TS	105	0	0	0	Table TS.8, "temperature high extremes" is unclear. Perhaps "maximum temperature extremes"\n\n (NETHERLANDS)
1165	TS	105	0	0	0	Table TS.8: Seems repetetive with Table TS.5. Some kind of merge. Also, is the term "key" here used as it is in Chapter 19 (i.e., caused by an anthropogenic change)? The TS needs to be consistent with the underlying chapters. (UNITED STATES OF AMERICA)
1166	TS	105	0	0	0	Table TS.8, 1st row under "rising air, soil and water temperature", 4th column ("emergent risks"): include "Ecosystem change and loss of ecosystem services". (NORWAY)
1167	TS	105	0	0	0	Table TS.8: Please consider including examples from Central and South America? (NORWAY)
1168	TS	106	0	0	0	Table TS 8 - Examples from Asia - It is suggested that the key risk related to permafrost thaw be revised to "...infrastructure on ice-rich permafrost". This is important because issues of infrastructure integrity are more important where permafrost is ice-rich as the ground is more likely to settle as it thaws resulting in deformation of foundations etc. (Smith, Sharon, Geological Survey of Canada)
1169	TS	106	0	106	0	No examples from Latin America and Caribbean region and there are plenty in the literature. (Lacambra Segura, Carmen, Grupo La era)
1170	TS	106	0	106	0	Strongly support mention of the need to consider cumulative impacts across time, space and governance scales in assessments and actions, e.g. such as text which appears in the rightmost box on Australasian examples in table on page 106. This is important for marine (especially inshore) and coastal systems. (AUSTRALIA)
1171	TS	107	0	0	0	Table TS.9. Please replace "perceived risk to public health" in the upper right box by "real or perceived risk to public health". Your statement is a political one and thus not appropriate within an IPCC report, as currently risk to public health cannot be excluded. (GERMANY)
1172	TS	107	0	107	0	The same comments than for the summary for decision makers in table 6SPM Coasts: a fourth option is not included. This option is to leave the coastal ecosystems as they are and promote their conservation. (Lacambra Segura, Carmen, Grupo La era)
1173	TS	108	0	0	0	Table TS.10 Comment - Suggest simplifying and generalizing to shorten (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
1174	TS	108	0	0	0	There are two projects in Ecuador that are working directly with water management to increase the resilience of communities. (Galarza, Maria Jose, Ministerio del Ambiente del Ecuador)
1175	TS	109	0	0	0	Table TS.10 orange part: PES statement refers to Central and South America. Reference paragraphs 17.5.2 and 17.5.4 refer to developing countries and not specifically to Latin-America.\n\n (NETHERLANDS)
1176	TS	109	0	0	0	Table TS.10 orange part: Only the beneficial effects of a PES are summarized in this table while reference paragraph 17.5.4 states that PES approaches in developing countries have met with mixed success.\n\n (NETHERLANDS)
1177	TS	109	0	0	0	Table TS.10 orange part: Only the beneficial effects of a PES are summarized in this table while reference paragraph 17.5.4 states that PES approaches in developing countries have met with mixed success.\n\n (NETHERLANDS)
1178	TS	109	0	0	0	Table TS.10 Bottom row. TS states land cover change can affect catchment yields. Chapter states increased sequestration is projected to reduce catchment yields.\n\n (NETHERLANDS)
1179	TS	110	0	0	0	Box TS.1, Figure 1. Use an equal-area projection to accurately present the world. The current map inaccurately portrays surface areas and the relative areas of land and sea and of various continents with one another. (Gonzalez, Patrick, National Park Service)
1180	TS	110	0	0	0	Figure TS-1 - This figure might be better split up into 3 containing A&B, C, and D -- the three parts together appear to be an urelated group of facts since they all make different points. (UNITED STATES OF AMERICA)
1181	TS	110	0	0	0	Box TS.1 Figure 1. Implied ordering of subfigures from top as (b) (a) (c) is confusing. Reorganise. (McNeall, Doug, Met Office Hadley Centre)
1182	TS	110	0	0	0	Box TS.1 Figure 1. Subfigure (b). Map not really necessary - for example subfigure (c) just uses a table. Use of 3 dimensional barplots uneccesary. Use 2 dimensional bars, if absolutely needed. 1981-1990 timeframe appears always close to zero, so does not impart any information. (McNeall, Doug, Met Office Hadley Centre)
1183	TS	110	0	0	0	Box TS.1 Figure 1. Why does graph show time since 1970, when this is mostly zero, and other parts of the figure use a timeframe from 1981? Suggest using same timeframe for all three subplots (McNeall, Doug, Met Office Hadley Centre)
1184	TS	110	0	0	0	Box TS.1 Figure 1. Suggest replacing subfigures (b) and (c) with a single graph, a 2 dimensional barplot. (McNeall, Doug, Met Office Hadley Centre)
1185	TS	110	0	0	0	Box TS.1: See broad comments in File: IPCC-AR5-NBCCRC-Maclellan-2013.pdf. (NOTE: The comment actually said this was an SPM comment, but the "From Page" had the Box TS.1 callout) (MacLellan, James, University of New Brunswick)
1186	TS	110	0	0	0	The heading for (c) is wrong (if the caption is right) - papers on e.g. "Central America" or "West Africa" will not have been counted, which may seriously skew the statistics compared to what the heading says given e.g. many comparatively small countries in those 2 regions which might be naturally mentioned together in titles, abstracts & keywords (Ingram, William, Met Office)

#	Ch	From Page	From Line	To Page	To Line	Comment
1187	TS	110	0	110	0	Figure 1. Don't know this paper, so perhaps this comment is not accurate. It could be misleading as a lot of the literature and research that is currently being published a lot of the times add the term "climate change" to make it more appealing for publication and funding. The contrary also occurs, a lot of research that is being done on ecology, geomorphology, geology etc and that might be directly related to climate variability do not add the key words and hence do not appear in this type of searches. (Lacambra Segura, Carmen, Grupo La era)
1188	TS	111	0	0	0	Box TS.3 Figure 1 Comment - Add "low", "medium", "high", etc. on the shaded confidence scale. (UNITED STATES OF AMERICA)
1189	TS	111	0	0	0	Box TS.3 Figure 1. Suggest placing labels "High Confidence" and "Low Confidence" directly on confidence scale on the graphic. (McNeall, Doug, Met Office Hadley Centre)
1190	TS	112	0	0	0	Box TS.4 Figure 1: Please see our comments on Box SPM.3 Figure 1. (GERMANY)
1191	TS	112	0	0	0	Box TS-4, Figure 1 Comment - The key message(s) of this figure are not at all clear. There is no added value to this figure. (UNITED STATES OF AMERICA)
1192	TS	112	0	0	0	Box TS.4 Figure 1. This diagram is confusing, and could be simplified considerably. For example, It is unclear how the addition of the "solution space" adds any value to the diagram. At the moment, a simple list of the factors which affect vulnerability would summarise the same information. (McNeall, Doug, Met Office Hadley Centre)
1193	TS	113	0	0	0	Figure TS.1: The figure is too complex, too detailed, too small, and the caption is too long and incomprehensible. Please improve this figure, simplify and reduce to main messages. A: left graph: dashed lines? Tpejus? green arrows? text under the x-axis? right graph: blue-red bars? rhombus in the middle, gray shading, arrows? B: what does this figure show? what are "warm-temperate pseudo-oceanic species"? caption notes that long-term changes are shown, but the graph shows time slots instead. C: different colors? numbers? what is the meaning of the character triplets at the upper margin of the graph? D: what is shown on the x-axis? Caption: The caption needs to be comprehensible to non experts, and it is suggested to reduce the amount of information provided. (GERMANY)
1194	TS	113	0	0	0	Figure TS.1 subfigure A. Suggest labelling temperature scale to indicate which colour is "warmer" and which is "cooler". (McNeall, Doug, Met Office Hadley Centre)
1195	TS	113	0	0	0	Figure TS.1 subfigure B. Is the Rainbow palette most appropriate here? Does it hide any information about the data? For examples, see http://www.research.ibm.com/people/l/lloydt/color/color.HTM (McNeall, Doug, Met Office Hadley Centre)
1196	TS	113	0	0	0	Figure TS.1 subfigure C. Suggest labelling "number of observations" (top row of numbers) directly on the graphic. (McNeall, Doug, Met Office Hadley Centre)
1197	TS	113	0	114	0	Fig TS.1 In caption to panel 'B', it doesn't say what sort of organisms are featured "only warm-temperate pseudo-oceanic species" - I presume that the figure is for copepods??? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
1198	TS	115	0	0	0	Figure TS.2 Comment - This figure suggests that socioeconomic pathways are the only development pathways. This is not true. Need to define 'key' and 'emergent'. What is Section C.ii.? This should be listed in the figure caption, not cited elsewhere. If it is elsewhere, perhaps this figure is not needed. (UNITED STATES OF AMERICA)
1199	TS	116	0	0	0	Figure TS.3 Comment - This figure suggests that rates of change and framing of adaptation feed into human resources, and natural resources, respectively which is not necessarily the case. There is no value added by this figure. Suggest deletion. (UNITED STATES OF AMERICA)
1200	TS	116	0	0	0	Figure TS.3 This diagram is overcomplicated, and offers no information further than just listing the key adaptation constraints in two lists. Further, the structure of the diagram suggests that a single "constraint affecting the societal context for adaptation" only influences a single "constraint affecting the implementation of adaptation policies and measures" (for example "framing of adaptation" only influences "natural resources"). I don't think that this is the information that the graphics aims to impart. (McNeall, Doug, Met Office Hadley Centre)
1201	TS	117	0	0	0	Figure TS.4: It remains unclear why the adaptive space is widening in time (along the adaptation pathway). We think it should shrink. Please insert a dimensionless timebar below the figure to show the time dependency of the process. Ratio: In accordance to Ch 16 P 2 L 43-44 as well as Figures 22-7 and 26-6 the adaptation corridor should shrink in time as adaptation limits are a result of interaction between climate change and biophysical and socioeconomic constraints. If climate change likely aggravates at least during the era of climate responsibility the potential for adaptation to reduce risks will decrease or in other words the adaptive space may narrow. Figures 22-7 and 26-6 illustrate this narrowing by clear adaptation limits in a 4°-world in a lot of sectors. This figure TS.4 is better than Figure SPM.2, because the link between A and B is clearer, and because TS.4 B has a link to time (yellow arrow). Maybe a synthesis of the two would be even better. See also our comments on Figure SPM.2 (GERMANY)
1202	TS	117	0	0	0	Figure TS.4 Comment - This figure provides no compelling information, nor is it supportive of the text. Suggest retaining only the upper section, "the Decision Cycle", including context. (UNITED STATES OF AMERICA)
1203	TS	117	0	118	0	Figure TS.4 and TS.5: See our comments on Figure SPM.2. (GERMANY)
1204	TS	118	0	0	0	The Governance pillar seems to be separate from the entire process of adaptation planning and implementation. It would have been preferable that it is at the centre of the figure since it is the engine that drives the four phases and determines whether the regime will adapt or not adapt to the ever changing circumstances. The figure very well addresses shortfalls of previous governance approaches that focused on a single governance unit - mainly the state - to address global collective action problems that are inherently problems involving multiple levels, but very little is mentioned in the report on multi level interactions at the vertical, upper horizontal and lower horizontal and multiple independent decision makers (Ostrom, 2010). This should also be addressed in the diagram where we have the multi-levels.\n\n (NETHERLANDS)

#	Ch	From Page	From Line	To Page	To Line	Comment
1205	TS	118	0	0	0	UNCLEAR statement Figure TS.5: "adaptation governance underlies capacity" \n\n (NETHERLANDS)
1206	TS	118	0	0	0	figure TS.5 reads "efforts in adaptation CAN be, whereas chapter 15 reads "NEED to be" (Chapter15, caption of Figure 15.1, p.52)\n\n (NETHERLANDS)
1207	TS	118	0	0	0	Figure TS.5 Comment - This is not a compelling or useful figure. How do changes in governance scales impact adaptive cycles? Suggest deletion. (UNITED STATES OF AMERICA)
1208	TS	119	0	0	0	Figure TS.6: It is not clear why the circles are concentric, and why personal is not in center. In addition, what do the gray-shaded triangles mean? What does the term "Systems and Structures" signify? In addition, the TS presents too many conceptual figures, this becomes confusing. (GERMANY)
1209	TS	119	0	0	0	Note that the idea of steering transformations that take place in these spheres of change (pratical, political, personal) is based on 1 source (O'Brien and Sygna, forthcoming) according to p. 24 of Chapter 20 and fig 20-2.\n\n (NETHERLANDS)
1210	TS	119	0	0	0	Figure TS.6 Comment - There is no value added from this figure. Suggest deletion. (UNITED STATES OF AMERICA)
1211	TS	119	0	0	0	Figure TS.6 This diagram offers little further information or contextualisation beyond the text. Consider removing, or major adaptation. (McNeall, Doug, Met Office Hadley Centre)
1212	TS	119	0	119	0	Fig TS.6 This figure is poorly explained and not easy to understand (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1213	TS	120	0	0	0	Box TS.5 Figure 1. There are no white or grey areas so you could shorten the caption. In the caption, say "Colors overlain with white circles" as there are no coloured circles. (Parker, David, Met Office Hadley Centre)
1214	TS	120	0	0	0	BOX SPM4 Figure1: Please show a figure with much higher resolution. As is it now, it is impossible to see the "gray" or "circles" . (NORWAY)
1215	TS	120	0	121	0	Box TS.5, Figure 1: The reference period should be pre-industrial for this figure to be useful, in the context of the 2C objective. Please explain all abbreviations in the caption (e.g. CRU, CMIP5). See also our comments on Box SUM.4 Figure 1. (GERMANY)
1216	TS	120	1	0	0	This figure should show results from RCP2.6. This scenario is extremely important for policy making. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
1217	TS	120	1	129	30	The "observations" do not include the fact that ther has been no change for 15 years Even with the wrong observations the model projections are complelely at odds with the observations (Gray, Vincent, Climate Consultant)
1218	TS	122	0	0	0	Figures TS.7: It is not completely clear what the figure shows, is it ground water recharge or a vulnerability index? If the latter, how is the sensitivity index mentioned in the caption defined ? Where can the information on the SRES scenarios B2 and A2 be found? It is suggested to remove the blue shading and just use gray for changes <10 %, this would be less confusing. If two models are shown, their differences should be commented in the text. If not (preferred), please show the median of the two models. (GERMANY)

#	Ch	From Page	From Line	To Page	To Line	Comment
1219	TS	122	0	0	0	Figure TS.7 Comment - AR4 and not AR5 results? This should be updated. (UNITED STATES OF AMERICA)
1220	TS	123	0	0	0	Figure TS.8 is an interesting figure. According to the figure, historical increase rate corresponds nearly to that of RCP6.0. At least, RCP4.5 is lower than the historical increase rate. The comparisons between the historical increase rate and the estimated displacement rate and between the historical increase rate and the rate of RCPs should be also discussed. (Akimoto, Keigo, Research Institute of Innovative Technology for the Earth (RITE))
1221	TS	123	0	0	0	Figure TS.8: see our comments on Figure SPM.3. Captions of Fig TS.8 and Fig SPM.3 are not the same, please check. Caption of Fig. TS.8: Please explain CRUTEM4 and CMIP5 for laypersons. (GERMANY)
1222	TS	123	0	0	0	Figure TS.8 Comment - Consider putting rate of displacement (km/y) on the y-axis of right hand figure. (UNITED STATES OF AMERICA)
1223	TS	123	0	0	0	Fig. TS.8: Left side seems extremely useful. However, it is not very clear at the moment. Consider a) changing background colors not using read, b) minimize distance between inset lines and model runs, c) consider smoothing the time series (Rutishauser, This, University of Bern)
1224	TS	123	0	0	0	Fig. TS.8: Move letters A, B, and C to the upper left corner on the same line (Rutishauser, This, University of Bern)
1225	TS	123	0	0	0	Fig. TS.8, C: What's the meaning of "human assistance"? Human coontribution to rate of discplacement? Humans manually displacing animals? Humans discplacin animals to help them? I suggest "Human contribution". (Rutishauser, This, University of Bern)
1226	TS	123	0	123	0	This figure is very crowded and difficult to read. Perhaps the 3 panels (a-c) could be separated a little more. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1227	TS	124	0	0	0	Figure TS.9: Please see our comments on Figure SPM.4. (GERMANY)
1228	TS	124	0	0	0	Figure TS.9 (B) contains a world map with national borders. It is suggested to use a map without borders to avoid unnecessary disputes. (CHINA)
1229	TS	124	0	0	0	Figure TS.9. Use an equal-area projection to accurately present the world. The current map inaccurately portrays surface areas and the relative areas of land and sea and of various continents with one another. (Gonzalez, Patrick, National Park Service)
1230	TS	124	0	0	0	Fig. TS.9, B: Correct "catch potential" in the figure (Rutishauser, This, University of Bern)
1231	TS	124	0	0	0	Fig. TS.9, C: Text to color bars at the very bottom are much too small. Text in general very small. (Rutishauser, This, University of Bern)
1232	TS	124	0	124	0	Fig TS.9 The figure is ok but the panels are too crowded and laid out in a very ugly and confusing way. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
1233	TS	125	0	0	0	TS.10: Are these absolute changes in global crop yields (please specify crops), or relative contribution of climate change? Probably projections are very different for different regions - does it make sense to show global data without distinguishing regions? What climate scenarios are these projections based on? Please add information on the emission scenario / temperature range this information is based on. In addition, it would be extremely useful to show this information for different scenarios. Please expand caption to better describe what is shown in the graph. (GERMANY)
1234	TS	125	0	0	0	Graph is difficult to understand. First, concensus will lie between 0% and 100% but y-axis has both negative and positive percentages ?? Second, we fail to grasp the idea of the bars with all that coloring.The legend says yield change bins and y axis % of given yield ranges. Is this the same? Do all bins sum up to 100%? The x axis is a projected change. Relative to what? Please make the graph more easy to understand! \n\n (NETHERLANDS)
1235	TS	126	0	0	0	TS.11: This figure is unclear to a point of not being useful. According to the caption, it is related to human security (=conflict?), but how? Is it a conceptual figure, or based on observations, as indicated by the word "evidence" in the caption? What are the ellipses supposed to mean, and is there an interpretation to the overlapping areas? Which selection criteria have been applied for the examples? Why are some arrows blue and others white, and some circles white and some black? Why is e.g. migration and mobility limited to the low to medium climate stress area? What kind of intervention is meant by "climate stresses lead to involuntary abandonment of settlements"? Figure and caption need careful revision, or should not be deleted. (GERMANY)
1236	TS	126	0	0	0	Complicated/vague graph. We find it hard to grasp the idea. \n\n (NETHERLANDS)
1237	TS	126	0	0	0	Figure TS.11 Comment - This figure is subjective. An important message, but not sure if it shows clear path dependencies - or even if the path dependencies are appropriate. Does conflict always go up with high climate stress, for example? (UNITED STATES OF AMERICA)
1238	TS	126	0	0	0	Figure TS. 11 Arrows appear colour coded, although inconsistent (i.e. furthest arrow left is blue, but should be red, as this appears to indicate an increase in stress. (McNeall, Doug, Met Office Hadley Centre)
1239	TS	127	0	0	0	Figure TS.5.: The figure only discusses Africa, Europe and North America and should include Asia as well, as risks are varied among regions. It is also important for policymakers to understand risks estimated for the mid-term, or the period in between the era of climate responsibility (2030-2040) and era of climate options (2080-2100); and therefore, a figure should be included for global average warming of 3 degrees above preindustrial. Furthermore, given the diversity of regional risks and effective adaptation, the risk levels provided relate to different phenomena and adaptation choices and are therefore are difficult to compare; and therefore, the figure should be revised to provide examples of the projected risks and adaptation choices considered in producing the figure and to include comparable numerical values. The ideas represented by the figure may be better presented in the form of a comparable chart. (JAPAN)
1240	TS	127	0	0	0	Figure TS.12 Comment - This figure quite subjective. Does not add value to the text and should be removed. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
1241	TS	127	0	0	0	Figure TS.12 Comment - What is the significance or basis for the three different colors? They seem somewhat irrelevant and decorative. (UNITED STATES OF AMERICA)
1242	TS	127	0	0	0	Figure TS.12: These figures encompass a lot of information and the idea behind is very good. But some of the information do not seem to be explained in the figure text, for instance: Please indicate a year for "present" (the report will live in many year (NORWAY)
1243	TS	127	0	128	0	On figure TS.12 it is unclear why 'ocean systems' are always left blank. (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1244	TS	127	0	129	0	An explanation should be given in captions as to why some quadrants of the wheels are completely blank. (AUSTRALIA)
1245	TS	127	0	129	0	Figure TS.12 shows only the comparison of impacts and adaptations between 2 and 4 degrees C. However, from the mitigation viewpoints, there are big differences between 2 and 3 degrees C and even between 2 and 2.5 degrees C. The comparison between 2 and 2.5 degrees C or between 2 and 3 degrees C is much more important and useful for policy making. Please add the assessment for 3 degrees C at least (and 2.5 degrees C if possible). (Akimoto, Keigo, Research Institute of Innovative Technology for the Earth (RITE))
1246	TS	127	0	129	0	Figure TS.12: See our comments on Figures SPM.5 A-C. (GERMANY)
1247	TS	127	0	129	0	Figure TS. 12 Radial graphs appear to offer no advantage, but make it more difficult to compare data across sectors. Consider using standard bar plots for greater clarity. (McNeall, Doug, Met Office Hadley Centre)
1248	TS	130	0	0	0	Figure TS.13: Useful figure, easy to understand; could it be provided for other regions too? However, as it appears in the section on future climate change, it shows however observations from the past. The figure does not fit in this section, it would be better to show information on the projected changes and associated risks in this context. (GERMANY)
1249	TS	131	0	0	0	Figure TS.14: This figure is already part of Figure TS.9, please delete. (GERMANY)
1250	TS	131	0	0	0	Figure TS.14. Use an equal-area projection to accurately present the world. The current map inaccurately portrays surface areas and the relative areas of land and sea and of various continents with one another. (Gonzalez, Patrick, National Park Service)
1251	TS	131	0	0	0	Figure TS14 Comment - this is the same as figure TS9C. Figure TS14 should be removed. (UNITED STATES OF AMERICA)
1252	TS	131	0	0	0	Figure TS 14 should also include the risks and vulnerabilities related to the North Atlantic e.g. acidification, movement of organisms etc. This figure should also be considered for inclusion in the SPM since the ocean is not covered so well in the other (NORWAY)
1253	TS	131	0	131	0	Note that figure TS. 14 is duplicated in it's entirety within TS. 9 (page 124) - is this necessary?? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)

#	Ch	From Page	From Line	To Page	To Line	Comment
1254	TS	132	0	0	0	Fig TS 15 - The line associated with Canadian North box does not point to northern Canada but rather southern Canadian agricultural region. If this box is meant to be associated with issues in northern Canada and therefore Arctic then it could be combined with Arctic box. If it is supposed to be associated with agricultural region (Prairies) then it should be re-labelled as western Canada. (Smith, Sharon, Geological Survey of Canada)
1255	TS	132	0	0	0	Fig. TS 15 - The issues raised for Russian Arctic are also true for Canadian Arctic - i.e. issues of thawing permafrost, ice free season etc. (Smith, Sharon, Geological Survey of Canada)
1256	TS	132	0	0	0	Figure TS.15: This figure seems suitable for the TS, but see our suggestions for improvements on Figures SPM.6. (GERMANY)
1257	TS	132	0	0	0	Figure TS.15 contains no examples of significant disaster impacts felt in other Asian regions like East Asia and Central Asia. It is suggested to add examples of Asia taking into account relevant chapters, such as Chapter 24. (CHINA)
1258	TS	132	0	0	0	Figure TS.15 contains a world map with national borders. It is suggested to use a map without borders to avoid unnecessary disputes. (CHINA)
1259	TS	132	0	0	0	Figure TS.15. Use an equal-area projection to accurately present the world. The current map inaccurately portrays surface areas and the relative areas of land and sea and of various continents with one another. (Gonzalez, Patrick, National Park Service)
1260	TS	132	0	0	0	Fig. TS.15: Not clear. shade land areas. (Rutishauser, This, University of Bern)
1261	TS	132	0	0	0	Figure TS.15: Abreviations and acronyms in the figure need to be explained. In addition please consider including more about biological risks. (NORWAY)
1262	TS	132	0	132	0	Figure TS15 - the Great Barrier Reef and associated coast is a highly relevant multiple impact hotspot for Australia (cyclones and other extreme weather, sea level rise, OA, flooding). Could a marine example be added to the list? (AUSTRALIA)
1263	TS	133	0	0	0	Box TS7 Figure 1: \n1) Please clarify "past" means since pre-industrialization or not. \n2) Clarify when is present. Is it 2010 or 2014 or some other year? From the Figure, present seems to be different from the time when temperature increase was 0.\n3) In lines 48-50 on page 40 of WG2/Ch. 19, there are explanations about the left hand bar of Box. SPM6. Figure 1 descriving a transition to red is located at 1 degree and also a transition to purple is located around 2 degree. This explanation is not consistent with the Figure. Also please add this explanation to Box. SPM6. Figure 1 and in doing so, make it clear the base year from when 1 degree and 2 degree are counted (in reading lines 48-50 of page 40 of Ch. 19, this seems to be from 1990). \n4) Does the temperature increase in this Figure mean in 2100 or at the equilibrium?\n5) Please make it clear that adaptation is not included in the same way as in Figure SPM 2 of AR4/WG2.\n6) Please add the note to this Figure that the risk varies depending on development pathways and this is not reflected in this Figure. (Yamaguchi, Mitsutsune, The University of Tokyo)
1264	TS	133	0	0	0	Box TS.7 Figure 1: not just wirte "Expert judment" but should write "Expert judment by the lead authors of Chapter 19". (Akimoto, Keigo, Research Institute of Innovative Technology for the Earth (RITE))

#	Ch	From Page	From Line	To Page	To Line	Comment
1265	TS	133	0	0	0	Box TS.7 Figure 1: Purple coloer can be seen from around 1.5 degrees C in the figure; however, the text describes that the purple is from 2 degrees C. The figure should be revised to meet the text. (Akimoto, Keigo, Research Institute of Innovative Technology for the Earth (RITE))
1266	TS	133	0	0	0	Box TS.7 Figure 1: See our comments on Box SPM.6 Figure 1. (GERMANY)
1267	TS	133	0	0	0	Box TS7 Figure 1: 1) Please clarify "past" means since pre-industrialization or not. 2) Clarify when is present. Is it 2010 or 2014 or some other year? From the Figure, present seems to be different from the time when temperature increase was 0.3) In lines 48-50 on page 40 of WG2/Ch. 19, there are explanations about the left hand bar of Box. SPM6. Figure 1 describing a transition to red is located at 1 degree and also a transition to purple is located around 2 degree. This explanation is not consistent with the Figure. Also please add this explanation to Box. SPM6. Figure 1 and in doing so, make it clear the base year from when 1 degree and 2 degree are counted (in reading lines 48-50 of page 40 of Ch. 19, this seems to be from 1990). 4) Does the temperature increase in this Figure mean in 2100 or at the equilibrium?5) Please make it clear that adaptation is not included in the same way as in Figure SPM 2 of AR4/WG2.6) Please add the note to this Figure that the risk varies depending on development pathways and this is not reflected in this Figure. (JAPAN)
1268	TS	133	0	0	0	Box TS.7 Figure 1 Comment - Burning embers. Not sure how purple relates to limited capacity. (UNITED STATES OF AMERICA)
1269	TS	133	0	0	0	Box TS.7 Figure 1 Introduction of purple colour "for the first time" meaningless when colour scale is arbitrary. Brings to mind "turning up to 11" sketch of Spinal Tap fame. Negative connotations of Hyperbole. (McNeall, Doug, Met Office Hadley Centre)
1270	TS	133	0	133	0	Strongly support including the new purple colour and the category 'risks to unique and threatened systems' (AUSTRALIA)
1271	TS	134	0	0	0	BOX TS.9: This figures shows a lot of incoherent information and the capture is not correct. Please revise or delete.Figure OA-1 B. shows the pH for RCP 2.6 and RCP 8.5, this figure seems easier than Figure OA-1 C, which is taken up here. Specific comments and suggestions: \nFig a: 1) The arrow below the graph seems to refer to uncertainty, but is this referring to the statements above or to their effets on ocean acidification? Is there less uncertainty of ocean acidification caused by increased CO2 than for CO2-increase due to fossil fuel emissions? Please revise or delete. 2) The caption is not consistent with what is shown in the figure. The first states that the figures shows impacts and option, but the latter also shows causes and properties of ocean acidification. \nFig b: Caption is insufficient, what is actually shown, what is randon effects meta-analysis (weighted or not?), what do "effect size (LnRR) and negative values mean, what is bootstrapped? \nBoth: Plot A and B are very different, please provide information in the caption why are they linked. (GERMANY)
1272	TS	134	0	0	0	Box TS.9 Figure 1: Align letters A and B; make fonts bigger (Rutishauser, This, University of Bern)
1273	TS	135	0	0	0	Figure TS16 - Inequality appears twice in the list of societal stressors. Support keeping this diagram. (AUSTRALIA)

#	Ch	From Page	From Line	To Page	To Line	Comment
1274	TS	135	0	0	0	Figure TS.16: \nThis figure very policy relevant, and with improvements it could also convey the AR5-WG2-concept of the eras of climate responsibility and option. The figure should be accompanied by the text Ch1 P 12 L 14-30. The legend should explain the "opportunity space" in this context by inserting after the first sentence: "Rapidly advancing climate science provides an “opportunity space” for policy relevant information to support policy decisions. The pathways identified in this report point to an era of climate responsibility, addressing the interconnectedness of multiple vulnerabilities for unavoidable impacts, and the era of climate options, the opportunity space to transform our actions toward a low risk and high resilient future." (from Ch 1, P 12 and P 10).\n\nSpecific suggestions: \n- details are too small, please enlarge figure and reduce detail\n- Inequality as societal stressors is mentioned twice.\n- the horizontal axis should indicate the two eras. \n- explain what the sections in the circle show.\n- legend of green/red policy decisions should be outside the graph, not on the time axis\n- explain the red arrows (are these two biophysical stressors?) \n- what a the link between the sectors indicated in the middle of the left circle and the wedges (planetary systems according Rockström)\n- is the green arrow (climate change) a process transgressing a planetary boundary? (is climate change not be a biophysical stressor?) (GERMANY)
1275	TS	135	0	0	0	Graph is too complex for me. Just do not understand.\n\n (NETHERLANDS)
1276	TS	135	0	0	0	Figure TS.16 Comment - Planetary boundaries are not well quantified or understood, especially the complexity of interacting factors that are not accounted for. Rockstrom et al., 2009 is descriptive and qualitative. This figure is problematic and should be removed from the TS. (UNITED STATES OF AMERICA)
1277	TS	136	0	0	0	Box TS.10 Figure 1: See our comments on Box SPM.7 Figures 1. (GERMANY)
1278	TS	136	0	0	0	Box TS.10 Figure 1 Comment - This figure suggests a concave/convex relationship between acceptable and unacceptable risks which is unlikely. There are likely a wide range of shapes that might define this relationship. The terms acceptable, tolerable, intolerable are policy judgments. This figure should be removed. (UNITED STATES OF AMERICA)
1279	TS	138	0	0	0	Figure CR-1: the caption requires substantial editing e.g. line 3; word missing between 'able' and 'shuffle'. Line 4 to end; the meaning of 'three CO2 seeps' is unclear, 2 should be subscript here and in other places. 'high CO2' should really be high concentrations of CO2 (Donnelly, Alison, Trinity College Dublin)
1280	TS	139	1	0	0	The top panel has many land areas shown in red where there are no rivers. E.g. Sahara. Important to note that only one model (HadCM3) was used. Other models could produce different results in some regions. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
1281	TS	140	1	0	0	The caption should state what scenario(s) were used to create this figure. It would be useful to know what times the changes shown could occur at - is 40% cover the current day or 2050? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
1282	TS	141	0	0	0	Figure OA-1 Comment - The ordering of panels in Figure OA-1 should be changed such that panel B becomes A, C becomes B, and A becomes C to reflect the order of reference to the figure materials in CC-OA. See comments on CC-OA in chapter 6 and 30 review comments. (UNITED STATES OF AMERICA)

#	Ch	From Page	From Line	To Page	To Line	Comment
1283	TS	141	0	0	0	Figure OA-1 Comment - This figure is redundant with TS.9, Figure 1 (UNITED STATES OF AMERICA)
1284	TS	141	0	141	0	Figure OA-1 (page 141) is almost identical to figure TS.9. (page 134). Is this duplication desirable, or necessary? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1285	TS	141	1	0	0	What is meant by "near future"? Are the results shown in Panel C scenario independent? (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
1286	TS	142	0	0	0	Figure RC-1. Same comment as on Box TS.5 Figure 1. (Parker, David, Met Office Hadley Centre)
1287	TS	142	0	0	0	Figure RC-1: Can the CRU dataset used be stated in the figure caption? The text on page 76 states that it is CRU TS3.10.01. (Caesar, John, Met Office Hadley Centre)
1288	TS	142	0	142	0	Figure RC-1 (page 142) is almost identical to figure TS.5. (page 120). Is this duplication desirable, or necessary? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1289	TS	142	1	143	0	Figures RC-1 and RC-2 should also show results from the RCP2.6 scenario. This scenario is very policy relevant. (Kentarchos, Anastasios, European Union DG Research, Directorate Environment Climate Change & Environmental Risks Unit)
1290	TS	143	0	0	0	Figure RC-2: Can the CRU dataset used be stated in the figure caption? (Caesar, John, Met Office Hadley Centre)
1291	TS	143	0	143	0	Figure RC-2 (page 143) is almost identical to figure TS.5. (page 120). Is this duplication desirable, or necessary? (UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND)
1292	TS	144	0	0	0	Box TS.9 Figure 1: B) significance star is plotted on the graph, so looks like data. Confusing. Consider moving star to label. (McNeall, Doug, Met Office Hadley Centre)
1293	TS	145	0	0	0	Figure WE-1 Comment - This is an awkward reconstruction based on limited constraints. Suggest including Skaggs et al., 2012. For proper reference, see comment for page 81, lines 33,34 Figure 2.1 or 2.2. As presented, the figure is not helpful and the information could be presented more coherently. (UNITED STATES OF AMERICA)
1294	TS	146	0	0	0	Figure VW-1 contains a world map with national borders. It is suggested to use a map without borders to avoid unnecessary disputes. (CHINA)
1295	TS	146	0	0	0	Figure VW-1. Use an equal-area projection to accurately present the world. The current map inaccurately portrays surface areas and the relative areas of land and sea and of various continents with one another. (Gonzalez, Patrick, National Park Service)