



**IPCC Synthesis Report
Fourth Assessment Report**

Formal Government and Expert Review of First Order Draft

EXPERT and GOVERNMENT COMMENTS – SPM

All Batches (July 27, 2007)

IPCC Synthesis Report - Fourth Assessment Report (All comments – SPM – July 27, 2007)

Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1	E-SPM-1	A	0	0			<p>1. A good thing about the SPM are the pointers in bold type that occur throughout the document. These act as signposts for the reader - but these are not consistent in their level of detail - the better ones are a single sentences and the less good ones cover 3-4 lines. They should be 25 words max and should not contain any numbers except dates. Good examples are seen on P4 lines 9,25 and 38-39.</p> <p>(John R. Porter, University of Copenhagen)</p>	Taken into account in revisions of headlines
SPM-2	E-SPM-2	A	0				<p>Your SPM is far too long and reads like a group-written statement. Policymakers need something shorter - 4-5 pages at most, culling out only the most important topics, and sometimes merging material from different reports. I suggest a compromise where you have an executive summary posted on top of your SPM, with the material below being the essence of the essence of the SPM [TSU note: This suggested summary is available in the Appendix]. Also, someone has to take a strong stand on this part of the document to exclude statements from groups who feel they are not being sufficiently represented!</p> <p>(Tom Crowley, Duke University)</p>	Length is consistent with Panel approved page length for SPM. Shorter SPM would lose vital information.
SPM-3	E-SPM-3	A	0				<p>Well done</p> <p>(Manfred Treber, Germanwatch)</p>	Thank you
SPM-4	E-SPM-4	A	0				<p>Throughout, in particular in sections based on WGI report, the language is often too technical and would profit from improvements trying to convey more clearly, with less jargon, and with simpler language precisely the same meaning. See also inf1.pdf (background material as prepared from IPCC secretariat).</p> <p>(Andreas Fischlin, Integrative Biology - Systems Ecology)</p>	Language is based on government-approved wording of WG SPMs over large parts.
SPM-5	E-SPM-5	A	0				<p>This is a very precious historical document, based on scientific research and evidence studied and contributed by many distinguished scientists and experts all over the world, which will help to lead humanbeing to take a new brave steps to combat with many and difficult issues to be solved in no time derived from climate changes as well as changing peoples' lifestyle and behavior depending too much on fossile energy resources and promote development of alternative renewable energy and finding out and create effective, efficient and appropriate adaptation and mitigating measures. We appreciate very much for the efforts people concerned dedicated to produce this document, which will play a very important role to change governmnet policy of many countries in a big way drastically. Every and all countries in the world whether they are developed or non-developed, especially the countires who emit the most large volume of Greenhouse gases, have to tackle with Climate Change problems very positively. It is reported that there was a long hours discussion in relation to expression of "likelihood" in the part of "present situation". In this connection, I would like to coments as follows: No.2line. [TSU note: See Comment E-SPM-216-A]</p> <p>(Susumu Nakamaru, Sun Management Institute)</p>	Noted. No specific change requested in this part of the comment.
SPM-6	E-SPM-6	A	0				<p>There is an asymmetry between the lower bound of climate sensivity - very unlikely to be lower than 1.5°C - and the upper bound - "values substantially higher than 4.5°C cannot be</p>	too complex for SPM; likely range of climate sensitivity is described

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							excluded, but agreement of models, etc.", which is spelled out in the topic 2 section 2.3 but does not show up in the SYR SPM. While it seems that authors chose not to make things unusefully complex with the usual but somewhat confusing juxtaposition of climate sensitivity estimates and scenario and time-dependant estimates of warming, this important piece of information is lost for policymakers. One possible way to bring it in the SYR SPM might be by adding a short comment or footnote to table SPM-1. (Cédric Philibert, International Energy Agency)	in Figure SPM-7.
SPM-7	E-SPM-7	A	0				There is a paradigm change from the First and Second Assessment Report to FAR: Today the question is not one of demonstrating that climate parameters tend towards warming, but one of causality: the global change detractors are attacking the causality: natural or anthropogenic. In my opinion this should be briefly mentioned somewhere. (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Rejected; This is a judgement that is outside the mandate of the IPCC, which is to assess all relevant available information without prejudice.
SPM-8	E-SPM-8	A	0				There are several places where technical concepts are included in the text which some policy makers may not be familiar with. Some examples are provided below. (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Noted. Space limitations prevent detailed explanations; glossary is part of report.
SPM-9	E-SPM-9	A	0				There are practically no comments. The Core Writing Team has carried out a good job; CPM is a clear, tight and very informative document reflecting to-day's vision of the problem. (Roman Corobov, Modern institute for humanities)	Thank you.
SPM-10	E-SPM-10	A	0				There are many cases in the SPM where comparatives are used. An example is P7 line 7 - 'greater natural climate variation'. When comparatives are used then the basis for the comparison needs to be given - and when 'larger' is meant then use it and not 'greater' etc. (John R. Porter, University of Copenhagen)	Taken into account; often the comparative case is clear from the context of the text.
SPM-11	E-SPM-11	A	0				The whole SPM appears to be a list of randomly chosen paragraphs between which there is no linking or evidence of a logical thought process. Whilst the paragraphs can be seen to detail the facts, it would be considerably more readable if these were linked into a coherent text to assist, in particular, government officials. It may be possible to solve this issue by adding a clarifying paragraph at the start of each section giving a brief background brief on what is about to be described in the "paragraphs/bullets" underneath. (Nick Campbell, ARKEMA SA)	Taken into account in revisions to provide more coherent storyline. Introductory paragraphs not possible due to space limitations.
SPM-12	E-SPM-12	A	0				The Summary for Policy makers effectively summarizes the three working group SPMs, but there is not much synthesis (new insights resulting from integration). (Donald Lemmen, Natural Resources Canada)	Noted.
SPM-13	E-SPM-13	A	0				The summary contains too many unexplained details to be comprehensible to most policymakers. Specific examples are given below. (Robert Molinari, University of Miami)	Noted. Space limitations prevent detailed explanations; glossary is part of report.

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SPM-14	E-SPM-14	A	0				The SPM reflects in my mind the basic findings of the 4th assesement report in a rather balanced way (Jean-Yves Caneill, EDF)	Thank you.
SPM-15	E-SPM-15	A	0				The report looks well put together. Being a summary, it has little discussion of the details, which are given in already published full reports. Therefore, I see almost nothing to add. The only comment I make is that as a scientist familiar with WG1, I found some results from WG2 and 3 (like SPM-6 and SPM-9) to be confusing. For example in SPM-6, what is "EIT"? I don't think it's defined anywhere. (Katsumi Matsumoto, University of Minnesota)	Thank you. Acronyms will be explained in glossary and appendix to published report.
SPM-16	E-SPM-16	A	0				The report is well written. It brings out clearly the main and important findings of IPCC Assessments. (Ramachandran Srikanthan, Physical Research Laboratory)	Thank you.
SPM-17	E-SPM-17	A	0				the overall cover of the summary is appropriate, but there is a missing emphasis on the impacts on biodiversity and the secondary impacts of this on ecosystem services and human productivity and well-being (Stephan Halloy, Conservation International)	Noted; space limitations prevent more detailed discussion in SPM; additional findings contained in longer report.
SPM-18	E-SPM-18	A	0				The organization of the SPM has the effect of requiring the reader to go through many pages before really getting to the key message. There needs to be an opening paragraph giving the key messages in the order that the reader will want them--namely what is most important to a decision maker. This could be achieved to a large extent by drawing from materials later in the text, as suggested in a separate comment. (Michael MacCracken, Climate Institute)	SPM follows Panel approved topics of the SYR.
SPM-19	E-SPM-19	A	0				The mixture of statements with and without likelihood properties may cause some confusion. In particular, it is not clear whether the absence of a likelihood property means that a statement is very certain or very uncertain or neither. (Michael Manton, Monash University)	Taken into accoint; statements without likelihood reduced; where they are stated, they represent statements of fact as written.
SPM-20	E-SPM-20	A	0				The meaning of the quoted confidence levels should be stated at least at the start of the SPM as they are in the longer summary otherwise it is not possible to understand the overall picture. (Nick Campbell, ARKEMA SA)	Clarified through initial footnote and use of italics for calibrated uncertainty language throughout.
SPM-21	E-SPM-21	A	0				The concept of climate change being exacerbated by the impacts of multiple stresses is important, but it does not appear until the last sentence of the SPM. (Michael Manton, Monash University)	Taken into account, brought forward in discussion to beginning of adaptation.
SPM-22	E-SPM-22	A	0				The 379 ppmv CO2 concentration value should appear, especially in 'Causes of Change' Section (Javier Martin-Vide, Group of Climatology)	Too detailed and unmotivated in the SPM.

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SPM-23	E-SPM-23	A	0				Some Figures have a title on top, apart from the caption, and some others not. Unify it. Moreover the top title of Figure SPM-1 has a type of letter different from the others titles (Javier Martin-Vide, Group of Climatology)	Made consistent in revised draft.
SPM-24	E-SPM-24	A	0				Since this is to be a synthesis of the material presented in the three working group reports, it can be considered new information and a stand alone report. The expectation is that the SPM does not need to simply be a summary of statements etc. presented in the SPM for the 3 working groups but rather summarize the important messages in the synthesis report (i.e. should not use a cut and paste type approach). This is the view taken by this reviewer in reading the documents. (Sharon Smith, Geological Survey of Canada)	Noted.
SPM-25	E-SPM-25	A	0				Regarding climate impacts: Issues related to increasing migration, violent conflicts that may take place due to a mix of drivers (such as ethnic rivalries, competitions over resources, climate change) are not mentioned in the summary for policy makers. (Martin Welp, University of Applied Sciences Eberswalde)	Correct; insufficient robust information in underlying report that can be directly related to climate change.
SPM-26	E-SPM-26	A	0				References are generally difficult to follow... but this might be just of this version (Luciana das Neves, University of Porto)	This will be clarified in published report.
SPM-27	E-SPM-27	A	0				Policymakers are likely to want less technical detail and clearer explanations of some statements/figures. (Joanna Haigh, Imperial College)	Taken into account in revisions; correctness of expressions is important however.
SPM-28	E-SPM-28	A	0				Overall, this is a very interesting SPM and I find it very useful. Apart from the comment on table 3, I have only minor suggestions (I do feel strongly about that comment though since giving unrealistically narrow ranges is very problematic). I have heard that lots of work went into the SYR report, and the result shows that the hard work paid off. (Gabriele Hegerl, Duke University)	Noted. Thank you.
SPM-29	E-SPM-29	A	0				needs a box describing the confidence intervals associated with the very high/high/medium estimates. How were these estimates reached? What does the word correspond to? (Peter Haas, University of Massachusetts)	Footnote added referring to box in introduction.
SPM-30	E-SPM-30	A	0				most of the figures are too large, some of them – too complicated/aggregated to be easily understood by non-climate professionals or to be of practical use for them (i.e., Figure SPM-2 on p. 3, Figure SPM-4 on p. 6). These could be reduced thus the size of the document to be diminished. The same refers to some tables, i.e. Table SPM-2 on p. 11: the upper part of this table is not very much different than the left panel of Figure SPM-5 (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Figure SPM-2 simplified. Table SPM-2 modified to avoid duplication.
SPM-31	E-SPM-31	A	0				message is clear. It is fine with the draft. (Hisayoshi Morisugi, Japan Research Institute)	Thank you.

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SPM-32	E-SPM-32	A	0				Many tables and figures, e.g., Table SPM-1, SPM2, Fig. SPM-5, in the summary show scenarios A2, A1B, B1. Is it possible to give a short introduction of the main stories or assumptions of those scenarios (Tiejun Ma, International Institute for Applied Systems Analysis)	Insufficient space in SPM; added footnote to refer to longer report.
SPM-33	E-SPM-33	A	0				Many policymakers would have been expecting the AR4 to make statements on Article 2 of the FCCC. In fact the only statement is buried in the unhighlighted text on p17. (Michael Manton, Monash University)	This statement has been strengthened and brought forward.
SPM-34	E-SPM-34	A	0				Many of my suggestions below also apply to SPM as it contains the same text/figure. (Zoltán Somogyi, Hungarian Forest Research Institute)	Noted.
SPM-35	E-SPM-35	A	0				It would be good to explicitly note in a footnote that the numbers in curly brackets, e.g. "{1.1}", indicate the section in the full synthesis report where this is discussed (even though it is nearly "standard" notation, it will probably save some confusion for some readers). (Mark Lawrence, Max Planck Institute for Chemistry)	This will be stated in the preface to the report
SPM-36	E-SPM-36	A	0				It might be useful to briefly mention that there are other radiative forcing factors besides CO ₂ , CH ₄ and N ₂ O, namely O ₃ (may be of increasing importance) and aerosols (organic and inorganic). These are, however, mentioned in the Synthesis Report. (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Too much technical detail for SPM. Aerosols are mentioned.
SPM-37	E-SPM-37	A	0				In the period from AR1 to AR4: there is certainly progress observed in the two fields Causes and Impacts, however I see less progress in the Policy part of the SPM dealing with Mitigation and Adaptation (no-regret) Measures. The contributions in the latter part are mainly dealt with by mathematical, modelling at a global level, while the no-regret, sustainable measures must be prepared by each IPCC member country at a national level. There is an observed discrepancy. I, as Netherlands Governmental Reviewer, had observed that trend earlier during the production of the AR4 and had made comments in this direction, during the earlier AR4 rounds of review (WGII and III). So my suggestion is to introduce now the notion that a Common Methodology (CM) for Mitigating and Adaptive Measures will be considered as a useful instrument. Such a Common Methodology will facilitate on one hand the IPCC assessment process on Mitigating and Adaptive Measures, and in the mean time stimulate the IPCC member states in their preparation for Measures at a national level. A CM provides a structured frame and a base for systematic analyses of no-regret, sustainable Measures by the IPCC Member States. IPCC has successfully produced and implemented different types of Common Methodologies. I, as technical secretary of IPCC-WGIII/SubGroupCZM (1989 – 1994), initiated the first IPCC-CM in 1991/2 on coastal Vulnerability Assessment (VA) – the Seven Steps. The application of this IPCC-CM on Coastal Vulnerability had success in the sense that 43 coastal nations made	Too detailed and specific for SPM. Not relevant for purpose of SYR.

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							<p>their own VA as reflected in the World Coast Conference 1993, held in The Netherlands, refer to the WCC'93 Report (attached PDF: 1993:....)</p> <p>Such a practical approach: making a CM on Measures and activating member states to apply the CM on Measures, could be a welcome counterbalance for the rather technocratic, mathematically, global (impact and measure) modelling approach by the present IPCC!!</p> <p>Such a practical approach will certainly be appreciated by the developing countries, which are at the receiving bad end of the CC impacts.</p> <p>For the contents of such a proposed Common Methodology, I refer to my previous contributions as reviewer of AR4 WG II and III and to r.misdorp@chello.nl. [TSU note: Comment continued in comment E-SPM-65-A]</p> <p>(Robbert Misdorp, International CZM-Centre, Ministry of Transport, Public Works and Water Management)</p>	
SPM-38	E-SPM-38	A	0				<p>in some parts the chapter discusses assessments of confidence, in others likelihood. These categories require specification.</p> <p>(Peter Haas, University of Massachusetts)</p>	Footnote added providing clarification and reference to box I.1.
SPM-39	E-SPM-39	A	0				<p>In general the SPM looks good to me but I'm afraid that those readers who are not familiar much with the topic or those who do not have scientific background might be confused understanding and interpreting the illustrations. In fact some of them such as Figure SPM-2, Table SPM-2 and Figure SPM-9 are rather cumbersome containing the graphics which is difficult to tell or long and complex captions. Authors may wish to streamline the above illustrations to make them more digestible and easier to grasp. (Optional)</p> <p>(Volodymyr Demkine, UNEP)</p>	Figure SPM-2 and Table SPM-2 revised; Figure SPM-9 deleted.
SPM-40	E-SPM-40	A	0				<p>In general I agree with the main presentation of the summary.</p> <p>(Ricardo Anadón, Universidad de Oviedo)</p>	Noted.
SPM-41	E-SPM-41	A	0				<p>in general check to make sure that confidence and likelihood estimates are consistent throughout the document.</p> <p>(Peter Haas, University of Massachusetts)</p>	Done. Statements derived from different WGs follow different uncertainty lexica; clarified through footnote and reference to box I.1.
SPM-42	E-SPM-42	A	0				<p>I would prefer if major headings would be numbered (1,2,3 or A,B,C) to help the reader to recognize the hierarchical level at which one currently reads. I am also missing a TOC, but trust that this will be available in the final version.</p> <p>(Andreas Fischlin, Integrative Biology - Systems Ecology)</p>	Topic numbers added.
SPM-43	E-SPM-43	A	0				<p>I want to commend the authors on an excellent draft. Synthesis of such a broad range of information is a difficult task, and the authors have acquitted themselves very well.</p> <p>(Michael Mastrandrea, Stanford University)</p>	Thank you.

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SPM-44	E-SPM-44	A	0				I thought the SPM in general was excellent - clear and concise (Keith Shine, University of Reading)	Thank you.
SPM-45	E-SPM-45	A	0				I strongly recommend to develop a better "titles and subtitles system" that will more rapidly lead readers to specific issues. I would envisage a very short subtitle above each bolded quotes or sub-sections. The quotes are too long to play the role of sbtitles...if it was the intention! (Yves Michaud, Geological Survey of Canada)	Titles and subtitles add to length of document. We believe the bolded headlines do carry the main messages.
SPM-46	E-SPM-46	A	0				I have checked the points related to the WG1 Chapter 5 on ocean changes and sea-level changes and find them to be consistent with this SPM. (Nathaniel Bindoff, CSIRO MAR and University of Tasmania)	Noted, thank you.
SPM-47	E-SPM-47	A	0				I found this Summary for Policy Makers rather difficult to read (Luciana das Neves, University of Porto)	Taken into account in revisions.
SPM-48	E-SPM-48	A	0				I found the text portion of the Summary for Policymakers easy to read. I have a couple of comments. New and emerging information on the breadth of topics covered by this summary is being widely reported daily. There needs to be a statement at the front end and repeated at the end recognizing this and that this document is a synthesis of the information available up until the date of cut off. (Ian Church, Yukon Government)	Literature cut-off date will be stated in the preface to the report.
SPM-49	E-SPM-49	A	0				I found the SYR well structured but sometimes a little difficult to follow from non expert readers....most of the problematic sections/paragraphs are listed above. Particularly difficult to access is also information from Tables SPM-2; SPM-4; and, Figure SPM-6 (Monica Beatriz Wehbe, National University Rio Cuarto)	Table SPM-2 revised; Figure SPM-6 deleted.
SPM-50	E-SPM-50	A	0				I could not figure out if its too much to gather in few pages or if there is some pages missing (Luciana das Neves, University of Porto)	Noted.
SPM-51	E-SPM-51	A	0				I am missing in the SPM a mentioning of the risks associated with biotic feedbacks, such as a diminishing carbon sequestration service from land ecosystems or even terrestrial biosphere becoming a net C source. All of these effects amplify climate change and are of key relevance. Compare WGII SPM, p. 6, first par., bullet 2 in TS (FGD, p. 20, section "Ecosystems" in TS.4.1), bullet 2 of ES of WGII chapter 4, and section 4.4.1 (Fig. 4.2), 4.4.10, and 4.4.11. While it is true that we discuss this point on SPM p. 8, lines 10-15, this is merely done in the manner this topic has been treated by WG1 in chapter 7, but this text ignores entirely what WGII chapter 4 has contributed. Notably chapter 4 has considered more literature than just the Friedlingstein et al., 2006 study and discusses in its assessment also the role of other factors, such as land-use change, which tend to be neglected in the studies WG1 chapter 7 discusses. This appears to be a major weakness of the SYR SPM I see much need for improvement. (Andreas Fischlin, Integrative Biology - Systems Ecology)	References to WGII chapter 4 included in longer report; biotic feedbacks are included in carbon cycle feedback. No additional quantitative information available from WGII that would be relevant at the level of the SPM.

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SPM-52	E-SPM-52	A	0				I am missing in the entire SYR any discussion of no regret policies. Even more importantly I am missing any reference to at least preserving or whenever possible enhancing resilience of social, economic, ecological, and physical systems. In particular in view of the many remaining uncertainties that point would deserve being somewhat addressed or is it really nowhere in the AR4? At least I can say that for ecosystems that is not the case and we discuss the merit of robust policy responses attempting to maximize resilience of systems (WG II, sections 4.6, 4.7). (Andreas Fischlin, Integrative Biology - Systems Ecology)	Space limitations prevent detailed discussion; SPM does list economic mitigation potential at zero price of carbon, and co-benefits of mitigation. Limited space for discussion of specific adaptation responses.
SPM-53	E-SPM-53	A	0				I agree with the Summary and have no specific comments (Michael Brady, Natural Resources Canada - Canadian Forest Service)	Noted.
SPM-54	E-SPM-54	A	0				Generally very well written, consistent, clear, and easy to read. Figures and tables are well chosen. (Ulf Molau, Göteborg University)	Thank you.
SPM-55	E-SPM-55	A	0				General comments: a message for Policymakers must be easy to read, as they are not they are not scientists and not used to practice research. The vocabulary must be understandable by everybody with as least as possible a glossary necessity (see proposals below). The organization of the message must be easy to follow; I suggest to put numbers to follow plan easily. It is also probable that many will only read sentences in bold; so conclusions must be also in bold. We must not forget that their interest for the Summary is due to their job, which supposes to take decisions related to warming which will mostly concern energy. (Annick Douguédroit, Université de Provence)	Noted and taken into account; no specific change requested at this point.
SPM-56	E-SPM-56	A	0				General comment on units: Shouldn't the units of greenhouse gas emissions be GtCO ₂ -eq yr ⁻¹ ? They are generally stated as GtCO ₂ . I had to read quite a bit to confirm that emissions are annual values, since this was not clearly stated. (Nathan Gillett, University of East Anglia)	Revised where necessary.
SPM-57	E-SPM-57	A	0				For large policy making effort it is useful to include in SPM the Figure 2.2 a and b from page 3 of Topic 2 . The placement of the figure is most preferable under the heading Causes of Change. (Joyashree Roy, Jadavpur University)	Rejected, does not appear to be of primary relevance for the assessment presented in the SYR.
SPM-58	E-SPM-58	A	0				Even though the text is well written and stands on its own some of the figures and tables which have of course been lifted from the fuller IPCC Working Group documents and the various Topic Chapters have now been separated from the explanatory text. The accompanying text that describes the figures often assumes familiarity with the material that would accompany the fuller text. I would suggest that the annotation should be reviewed and in some cases enhanced since I assume that the normal situation would be that the reader would not have the fuller text easily available. I specifically spent considerable time figuring out Figure SPM-9 and Table SPM-3 though I believe I have seen some of this before and understood it more	Taken into account where possible; space limitations do mean that explanations and context has to be condensed.

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							easily in the context in which it was presented. Figure SPM-6 was not as easily understood as was the same Figure in topic 4 Fig 4.2 just because of the enhanced annotation in 4.2 (Ian Church, Yukon Government)	
SPM-59	E-SPM-59	A	0				At what point do you compare the cost of stabilization with the avoid impacts (I realize there are not always costs associated but a list next to the cost of a reduction scenario would be illustrative and give the policy maker a sense of how much it costs to protect people's health, ecosystems, etc.) (Katherine Casey Delhotal, RTI International)	This is now explicit in topic 5 and corresponding SPM section.
SPM-60	E-SPM-60	A	0				At some stage of the Summary for policy makers, it should be stated that climate change is only one global change factor, and that in many regions pressures from other developments may easily overrule climate change effects. (Fuhrer Juerg, Agroscope Research Station ART)	Interaction with sustainable development is included; other pressures do not overrule climate change in all cases though.
SPM-61	E-SPM-61	A	0				All things considered, this summary set of chapters is tightly written. There are few lapses in ease of reading and or in the graphics and I have mentioned them above. Also, possibly you should not present the idea that "the problem" is scientifically bounded by errors that are understood and have known maximum values, ie that there are no surprises around unknown corners. Since we do not know how to simulate the evolution of Holocene climate or the Eemian climate this impression is not really accurate. (David Fisher, NRCan)	Not entirely correct as there is basic understanding of palaeoclimate evolution. Key uncertainties are mentioned in text where appropriate and also contained in separate topic 6.
SPM-62	E-SPM-62	A	0				All figures and tables presented in the SPM are the same as those provided in the full synthesis report (and in some cases are the same or very similar to those presented in SPMs for the WG reports). This repetition of figures does not necessarily add value and it would be better if only a few summary figures or tables were presented to summarize the key messages of the full SYR. Reduction in the number of figures would allow the authors to accommodate more text. In addition many of the figures and tables are rather complicated and confusing and perhaps are at too detailed for a SPM. A figure should be able to convey its message (and have impact) without excessively long captions and notes. (Sharon Smith, Geological Survey of Canada)	Space limitations for SPM are for text only, so deleting figures does not create more space for text. Figures have been revised for reader friendliness where consistent with the origin of the figure in WG reports.
SPM-63	E-SPM-63	A	0				Add the topic number to each of the major headings in the SPM for easier reference to the more detailed sections on the six individual topics. For example, change the heading on page one of 21 to read 'Observed changes in climate and their effects - topic 1'. Alter other major headings in SPM similarly. (Steven Clemens, Brown University)	Done.
SPM-64	E-SPM-64	A	0				A brief introductory paragraph in the SPM maybe useful. As it is now, the beginning of SPM seems rather abrupt. (Upasna Sharma, Indian Institute of Technology, Bombay)	Space limitations do not allow introductory paragraphs.

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SPM-65	E-SPM-65	A	0				<p>[TSU note: Comment continued from E-SPM-37-A] IPCC: be practical and do not loose your self in more and more refining of models alone, in more and more creating an own model-based language, otherwise your base of existence will be nibbled off by the REALITY. The REALTY asks from IPCC: Measures based on informed judgement of the Causes and Impacts of CC.</p> <p>IPCC: is a wonderful, UNIQUE, integrated international organisation combining pure science (Causes) with applied sciences (Impacts) with policy-preparation (Measures) in order to make better, sustainable long term decisions. The IPCC is unique in this world for that reason, but nowadays a bit out of balance!</p> <p>Attention should be paid to practical measures to mitigate and to adapt, after 18 years of its existence!</p> <p>At last: Your problem is that I made and make suggestions to IPCC, but that IPCC never came back with thanks and appreciation afterwards. I learned from your enticing text to participate in the round of SPM commenting and that my suggestions are welcomed, but I never got any feed back from IPCC. So either you are really interested in the ideas of the IPCC-second circle or you are not.</p> <p>I would like to receive a message from you that you have received my message and that you will forward my message to the highest echelon of IPCC, with a cc to me.</p> <p>If you take this opportunity to react, then I will provide you with more detailed reactions on the SPM and some Topics.</p> <p>If you will refrain from this action, then I will inform the Netherlands Government that the IPCC rounds of comments are well organised but have not so many practical bearings.</p> <p>Many greetings and I wish you success with the finalisation of the SPM, Robbert Misdorp, Amsterdam, The Netherlands (Robbert Misdorp, International CZM-Centre, Ministry of Transport, Public Works and Water Management)</p>	Noted. No additional comments provided.
SPM-66	G-SPM-1	A	0				<p>When discussing trends, the beginning year of the trend described (the base year) skips around quite a bit—on the 1st page alone, 1906, 1961, 1979, 1978, 1993, 1970s, and 1970. There may be some very good reasons why these years were selected, but the authors provide no explanation. This leaves the impression, whether deserved or not, that the conclusions would be different using different base years. More consistency would improve the clarity of the document. (Government of United States)</p>	Harmonised where possible. Not all data have similar starting points of observations though, and cannot be lumped into one basket.
SPM-67	G-SPM-2	A	0				<p>We would note that there were a number of places where the phrasing in this SPM has improved upon text taken from the WG SPMs. Specifically, we would note this to be the case for the discussion of observed changes in natural systems (page 2 line 14 to page</p>	Noted.

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							3 line 8) - well done. (Government of Canada)	
SPM-68	G-SPM-3	A	0				We would like to thank the core writing team for their hard work on this draft and we acknowledge the very tight timing following the 3 working group reports. However, while this is well written, we would have liked to see more synthesis in this report. This SPM does merge information from the working groups into one report, but it hasn't made synthesis statements which would have added value to policymakers that they would not get from reading the working group reports. (Government of Canada)	Noted. The revised report provides more synthesis in a number of places, including text and figures.
SPM-69	G-SPM-4	A	0				We ask the authors, in their work on this SPM draft, to recall that the Summary for Policymakers should be just that: a summary for policymakers. It needs to focus on information that is policy-relevant, not that which is science-relevant. It needs to be short, and use simple language and figures that are immediately accessible to a lay audience. Each piece of text, each table, each figure, should pass the 'so what?' test. (Government of New Zealand)	Taken into account in revisions. No specific change requested.
SPM-70	G-SPM-5	A	0				We appreciate the great deal of work that has gone into distilling the many pages of the Working Group I, II, and III reports down into the Synthesis Report and then into this Summary for Policymakers, and the difficulties that have had to be overcome. It is important that through this process the SPM (and the SYR as a whole) does not merely provide a summary of the three Working Group reports but, through the expertise of the author team, adds synthesis, cross-cutting and overview information that policymakers will not get from the reports individually. This will be a most valuable contribution of the authors and we urge them to give particular attention to it. (Government of New Zealand)	Noted. No specific change requested.
SPM-71	G-SPM-6	A	0				Topics 4 and 5: they contain too much text; consideration should be given to presenting the content in tables or graphics. (Government of Colombia)	Taken into account; Figure SPM-6 replaced with Table.
SPM-72	G-SPM-7	A	0				To improve the summary, it would be of great interest to decisionmakers to have a table of impacts by region (Africa, North America, Latin America, etc.) (Government of Colombia)	Too much detail and not possible for space limitations. Regional information is contained in the longer report in topic 3.
SPM-73	G-SPM-8	A	0				To improve the readability and the synthesis process some chapeau and link paragraphs may help, as may grouping some topics together. (Government of New Zealand)	Taken into account in revision of wording. Space limitations place constraints on linking paragraphs.

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SPM-74	G-SPM-9	A	0				There needs to be better delineation between sections 4 and 5; i.e., define "long term". WG3 uses "2030 and beyond" to define "long term" but it's not clear in the SPM or in the full SYR if this is still the case. (Government of Canada)	There is no clear cut delineation, consistent with the absence of a clear delineation in the Panel approved guiding bullets for topics 4 and 5. Emphasis is on 2030 time horizon in topic 4.
SPM-75	G-SPM-10	A	0				The use of the various conventions from the 3 WGs on confidence statements is confusing. We suggest including a footnote at the beginning of the document briefly explaining why this is done and defining the terms used throughout. (Government of Canada)	Footnote added.
SPM-76	G-SPM-11	A	0				The SYR adds value to the individual WG reports and we note with pleasure the efforts made to include cross-references to each of the WG reports when discussing integrative aspects of the climate system, impacts and emissions. However, it should be made clear on what grounds the choice of references have been done. (Government of Sweden)	Thank you. References will be clarified in preface to the report.
SPM-77	G-SPM-12	A	0				The Synthesis Report italicizes the terms likely, very likely, high confidence, very high confidence, medium confidence, etc., indicating that these uncertainty terms have specific definitions. However, the SPM provides no guidance as to how to interpret these terms. At the very least, the SPM should direct readers to Box I.1 (Treatment of Uncertainty) in the Introduction. Since it is likely that the SPM will be read separately from or before reading the Introduction, the U.S. Government strongly suggests a brief explanation of the uncertainty descriptors in a footnote on page 1 with a cross-reference to the more detailed Box I.1. (Government of United States)	Footnote added,
SPM-78	G-SPM-13	A	0				The SPM is a repeat of the text in the Topic sections without anything further to inform policymakers. Is that really useful? (Government of United States)	SPM has to reflect and summarise the key messages of the topics.
SPM-79	G-SPM-14	A	0				The sections dealing with adaptation are rather scant and could be added to (in terms of balance of the SPM) to highlight the role adaptation can play and the limits to adaptation actions without mitigation. At present the wording gives a somewhat optimistic picture of the ability of adaptation to effect the level of behavioural changes that will be necessary. (Government of New Zealand)	Text revised to better describe both opportunities and limits to adaptation.
SPM-80	G-SPM-15	A	0				The readability of the SPM would be helped by a very short introductory paragraph, before the first section, along the lines of: "This Summary for policymakers is an introduction to the most significant policy-relevant findings from the IPCC Fourth	Rejected; this appears to add no value and is not possible within the tight space constraints.

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							Assessment Report. It describes the climate changes which have been observed, their causes and impacts, the likely future changes, and possible ways to deal with climate change." (Government of New Zealand)	
SPM-81	G-SPM-16	A	0				The present SPM of the Synthesis Report is not balanced because it does not include description of uncertainties. It is suggested to move the description of "key uncertainties" in Topic 6 to the relevant part of the SPM or to summarize the key uncertainties in the relevant part of the SPM so as to provide more balanced information to policy-makers. If summarization is preferred, it is suggested to summarize the key uncertainties in the following aspects: (1) data (limited data and literature, gaps, geographical imbalance, and so on) and analysis methods, (2) attribution, (3) impacts, (4) projection (model, scenario, and so on), and (5) adaptation and mitigation. (Government of China)	Reference to robust findings and key uncertainties as per topic 6 added.
SPM-82	G-SPM-17	A	0				The draft SPM is rather optimistic about the role technology can play in mitigating emissions. It rather skims over the behavioural and institutional barriers to change that need to be addressed, if policies to reduce emissions to the level needed are to be effective. We ask the authors to consider the balance of this topic when editing the draft. (Government of New Zealand)	Text revised to refer to barriers.
SPM-83	G-SPM-18	A	0				The draft Glossary includes a definition of "climate change" as used by the IPCC, together with a "Note" on how it is used in the FCCC. However, the definition in the WG1 SPM footnote is worded somewhat differently from the glossary definition here. Why is that? Consider adding the footnote to the Synthesis Report SPM for clarity. (Government of United States)	The definitions are consistent, it is only a question of detail provided. Believe that glossary and box in topic 1 should be sufficient for clarification.
SPM-84	G-SPM-19	A	0				The details throughout the text about the difficulties of reliably simulating and attributing observed temperature changes to external forcings could be said once in a chapeau at the beginning rather than repeating it all through the text. The repetition of such information makes it more difficult for the policy reader to get the flow of the argument throughout the SPM. (Government of New Zealand)	Text re vised to streamline this discussion. Caveat is important though in several different contexts.
SPM-85	G-SPM-20	A	0				The authors have produced an excellent SYR and we are particularly pleased to see an inclusion on adaptation in the SYR. To make it even more accessible, we would like to suggest that the main messages should be stated short and to the point within a frame in the very beginning of the SPM. It could be to say (with appropriate certainty qualifications): " Warming is unequivocal - 1.1 to 6.4 C warming is projected for 2090-2100 - risks increase rapidly between 1.5-2.5 C - stabilisation at 450 ppm can keep warming below 2.5 C - requires average global reductions of 85 to 50% by 2050 and peak within few years, ie. substantial trends breaks - achieving such trend breaks and	Thank you. However, a summary of the summary is not appropriate as it would leave out vital caveats and present a narrowed view.

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							reductions require a multitude of policy efforts in all sectors now" . Such a paragraph at the beginning of the SPM would capture the essence of the SYR and the underlying reports. Further, it might be a help for the reader if, in the beginning of each main heading, which preferably should be numbered, a frame with the main statements in each following section is found. This would simply be statement of facts and not policy prescriptive. (Government of Sweden)	
SPM-86	G-SPM-21	A	0				Suggest adding a conclusion at the end of the SPM with a brief mention of Robust findings & Key uncertainties, similar to what has been done in at least two of the WG SPMs. Inclusion of a brief mention will, as a minimum, inform the reader that the full SYR contains this information. (Government of Canada)	Section on robust findings and key uncertainties has been added.
SPM-87	G-SPM-22	A	0				Since the Synthesis Report is to synthesize the reports of the three Working Groups, it is suggested to use the findings and conclusions contained in the three SPMs of the three Working Groups instead of drawing their own conclusions by the lead authors of the Synthesis Report. It is not wise to reintroduce those controversial issues which demonstrated no consensus during the discussions of the SPMs of the reports of the three Working Groups. It is therefore suggested to delete the first part of Table SPM-2 on page 11 of SPM and the corresponding part of Table 3.2 on page 11 of Topic 3. It is also not wise to add new contents, eg. the time period in WGII Figure 3.4 is to 2050, but is changed to the period 2090-2099 in Figure 3.3 on page 8 of Topic 3. (Government of China)	The SYR draws heavily on and is fully consistent with the WG SPMs. Table SPM-2 has been revised. It represents the information that was used by WGII in its assessment.
SPM-88	G-SPM-23	A	0				Readability and understanding would be enhanced by the addition of introductory text/captions for the beginning of the document and for each of the major sections. In the current draft, for the most part, the sections begin immediately with a bolded finding which makes for very abrupt reading. These intros can also highlight "what's new since the TAR" on a more consistent basis. These additions/ changes will also help the flow and overall storyline of the document and better achieve its purpose as a Synthesis. We will provide detailed comments for each section in the appropriate place. In addition, the readability would be enhanced by reducing duplicative statements and linking the paragraphs within each section together. (Government of Canada)	Space limitations prevent use of introductory paragraphs and a "what's new" section. Text revised to make key messages more readily accessible.
SPM-89	G-SPM-24	A	0				Please include definitions also in the SPM of the likelihood, confidence, agreement, evidence (Government of Sweden)	Footnote added.

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SPM-90	G-SPM-25	A	0				Most footnotes from WG1-WG3 are omitted but some of them are important to understand the background (e.g. the definition of pre-industrial era and treatment of uncertainties) . Basically all footnotes from WGs should be noted as long as it relates to the SYR. (Government of Japan)	Footnotes added where relevant and appropriate.
SPM-91	G-SPM-26	A	0				Might be useful to put all information on the meridional overturning circulation (MOC) in one place. (Government of United States)	This is in one place now.
SPM-92	G-SPM-27	A	0				It would be useful to follow the introductory paragraph with another short note on the advances since the TAR, perhaps along the lines of: "Since the IPCC Third Assessment Report, improvements to the data and models available, and to scientific understanding, have confirmed the climate is changing, provided details of regional changes, and provided a greater number and detail of robust findings." (Government of New Zealand)	Space limitations prevent the use of introductory paragraphs and "what's new" sections.
SPM-93	G-SPM-28	A	0				It should be made clear that the numbers in curly brackets refer to specific sections in the topic chapters. (Government of Norway)	This will be added in the preface to the report.
SPM-94	G-SPM-29	A	0				It seems there are many repetitions and duplications in the different topics, eg. in 1.1, 1.2 and 1.3 of Topic 3. It is suggested to rewrite this part. For example, snow and ice melting is treated as one of the evidences to show global warming in section 1.1, but meanwhile, the melting or reduction is treated as the IMPACT of climate change. It is doubtful whether it is possible to distinguish the observations of climate change with the observed effects of climate change. It is believed that is easy and reasonable to separate them in the two separate Reports of WGI and WGII, but it is difficult to separate them in a single report. We believe this part should be improved, otherwise it will be misleading for policymakers. (Government of China)	Text checked, there is no duplication of the kind indicated here.
SPM-95	G-SPM-30	A	0				It is clear that the SPM is in a very early stage of development and is in effect simply a cut and paste of the SYR as it currently stands. In later drafts the authors will need to present a more nuanced work that is reflective of the fact that for many, the SYR SPM will be the only part of the AR4 they read. (Government of Australia)	Taken into account in revisions. Important to draw on approved WG SPM language where applicable since this is how governments have already decided how to express a range of key findings.
SPM-96	G-SPM-31	A	0				It is assumed that all changes suggested to the body of the SYR will be reflected in the SPM.	Noted and taken into account.

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							(Government of Australia)	
SPM-97	G-SPM-32	A	0				Increasing the use of new diagrams and new figures to make this document more user-friendly for policy makers (e.g. concise figure like Figure I.1. in the AR4 SYR Introduction) is suggested. (Government of Japan)	Space limitations do not allow the addition of figures that would require further introduction in a text.
SPM-98	G-SPM-33	A	0				In general the SPM presents a good summary of the three working group SPMs, however, it provides very little value-added and is largely lacking in terms of true synthesis. Much of the text and several figures are taken verbatim from the previously approved SPMs, and intermixed to fit under the Synthesis Report topics. However there are few, if any, instances where integration of findings from the three working groups leads to new insights. An opportunity for such integration exists centred on "Reasons for Concern", whereby the climate projections of WGI, projected impacts of WGII and mitigation pathways of WGIII could be represented in a single diagram. Indeed Canada requested such a figure (aka burning ember) be included in the WGII SPM, but were informed that such a figure would be most appropriate in the Synthesis Report. It is disappointing to see that it is not present in this draft. It provides the type of integration the Synthesis Report should be striving for and we suggest it be added. The absence of such a Figure is all the more marked given the weak discussion of the Reasons for Concern in the SPM. We would also like to see this text (Page 16 line 38 to Page 17 line 12) considerably strengthened. (Government of Canada)	Taken into account to present a better synthesis of material. Burning embers figure was discussed but not supported by the entire author team.
SPM-99	G-SPM-34	A	0				General comment. SPM must have some sub-section on future research need. We propose to include into this sub-section the work "Methodologies and techniques for controlling the global climate with injections of aerosols into the stratosphere" (Government of Russian Federation)	Research needs are not within the mandate of the SYR.
SPM-100	G-SPM-35	A	0				General comment to the tables: All tables should have a short title. (Government of Norway)	Checked for consistency.
SPM-101	G-SPM-36	A	0				General comment to the figures. All the figures should have a title explaining the main issues dealt with. Furthermore we suggest that work is done on the graphical presentation of the figures in order to make them as accessible as possible for policy makers. (Government of Norway)	Checked for consistency, and additional graphic design carried out for cohesion of figures.
SPM-102	G-SPM-37	A	0				Figure SPM-3 from the TAR Synthesis Report SPM was a seminal Figure that did exactly what a synthesis should do - bring together information from the underlying reports in a way that succinctly delivers key messages to policymakers. (This was the Figure that	We see insufficient value in repeating a figure from the TAR, especially if some elements

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							showed the progression from SRES scenarios to emission changes to atmospheric concentration changes to radiative forcing changes to global temperature changes and finally to the Reasons for Concern.) Although only some of this information has changed from the TAR to the AR4, nonetheless, inclusion of such a Figure again would be an extremely valuable addition to the SPM and we would urge inclusion of such a Figure. (Government of Canada)	have not changed or been re-assessed. Table SPM-2 presents new synthetic information that we consider more valuable.
SPM-103	G-SPM-38	A	0				Editorial comment: as far as possible, standardize the font and font size for text in the figures. (Government of Colombia)	Checked and revised for consistency.
SPM-104	G-SPM-39	A	0				Authors should take note of comments made in the underlying Topic write-ups that need to be elevated to material contained in the SPM. (Government of United States)	Noted.
SPM-105	G-SPM-40	A	0				As with the body of the SYR, in the SPM the authors should explain in footnotes why different, reference years have been chosen to illustrate observed changes in the climate over time. (Government of Australia)	Reference years reflect the availability of relevant data; believe this is obvious.
SPM-106	G-SPM-41	A	0				As many readers will only read the SPM a footnote explaining the uncertainty typology used is necessary. (Government of Australia)	Footnote added.
SPM-107	G-SPM-42	A	0				An introduction to the SPM is necessary to introduce the document and its purpose. We suggest that it could begin with the first paragraph of the Introduction, page 1, lines 4-9. In addition, a sentence or two on how this is different from the 3 Working Group SPMs and a brief description highlighting how this is an advance from the TAR (possibly using the text in Topic 6, page 1, lines 17). Finally, a brief explanation of the confidence statements, why there are several conventions used in this report and making reference to Box1.1 would be useful upfront. (Government of Canada)	Space limitations prevent the inclusion of introductory paragraphs and “what’s new” sections. Footnote added to explain confidence language.
SPM-108	G-SPM-43	A	0				An initial section on methodological aspects of the AR4 would be useful to indicate the methodological progress since the TAR in terms of dealing with data, the extended data coverage and the treatment of uncertainty. These indications would convey to policymakers the message that the AR4 is more scientifically more robust than its predecessors (cf. lines 28-30 page 1 from the Introduction chapter) (Government of Switzerland)	Too complex for space constraints of SPM; there is no uniform methodological approach due to the multitude of disciplines covered.
SPM-109	G-SPM-44	A	0				Although this summary is comprehensible I feel that here concrete measures, as given in the other draft, would be helpful for policymakers but are missing. Why not take these	Space limitations prevent the extensive use of examples;

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							from the other draft? (Government of Switzerland)	some additional examples are given where possible and particularly relevant.
SPM-110	G-SPM-45	A	0				A lot of the text in the SPM could be reduced by merging the headings of the paragraph or by deleting the heading and highlighting the first following sentence of the topic paragraph. In the current layout, the headings seem to repeat in the topic paragraph that follows. (Government of Japan)	Taken into account in revisions of headlines and text.
SPM-111	G-SPM-46	A	0				"Burning embers" was not thoroughly discussed in WG2 held in Brussel in April, "Burning embers" diagram should be quoted in SYR. (Government of Japan)	Burning embers figure was discussed but not supported by the entire author team.
SPM-112	G-SPM-47	A	0				Some of the figures that were included already in the WG reports could be taken out, such as Figure SPM 9 (page 21) (Government of Germany)	Figure SPM-9 deleted; other figures retained since the present key findings of the AR4.
SPM-113	G-SPM-48	A	0				In general the SPM convey many important key findings from the three WG-SPMs. However it should be considered to include some crosscutting issues between the three workinggroups. Furthermore it would be interesting for the policymakers if you could give some indications about the number of expected "climate refugees" in the future and/or give some other aggregated information about the number of people affected by future climate change (the different impacts taken together). (Government of Norway)	Some synthetic findings are better developed in the revised draft. Insufficient information on "climate refugees" in underlying WG reports.
SPM-114	E-SPM-1	B	0				I think the document is clear, in general, and gives a clear message to policymakers. (Constanta Boroneant, National Meteorological Administration)	Thank you.
SPM-2126	G-SPM-1	D	0				General comment. It is very good as to content, writing style, and illustration (figures and tables). (Government of Argentina)	Thank you.
SPM-115	E-SPM-66	A	1	0			To what do the curly brackets ({ and }) refer? I presume to sections of the WG reports and this needs to be made clear. (John R. Porter, University of Copenhagen)	SPM refers to longer SYR report. This will be clarified in the preface to the report.
SPM-116	E-SPM-67	A	1	1			Is somewhere explained that { x.x } indicates chapter numbers? (Christof Appenzeller, Federal Office of Meteorology and Climatology MeteoSwiss)	SPM refers to longer SYR report. This will be clarified in the preface to the report.
SPM-117	G-SPM-49	A	1	3	1	3	The meaning of words in italics used in the treatment of uncertainty, such as likely, confidence, etc should be explicated at the very beginning, with proper reference to Introduction Box 1. Preferably, this Box should be annexed to the SPM, as the SPM only	Footnote added.

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							will be read by many decision makers. An alternative solution would be including the introduction into the SPM, which would help the SPM reader in many respects.. (Government of France)	
SPM-118	E-SPM-68	A	1	3			This section needs an introductory paragraph to set the tone of the whole report. I would suggest inserting here the text that is included in Topic 5, page 1, lines 25-32. This would much more clearly indicate that the degree of urgency is increasing. Also, the text in Topic 5, page 4, lines 25-27 should be moved to the very front. (Michael MacCracken, Climate Institute)	Not appropriate to present a summary of the summary. SPM follows the approved topic headings of the SYR.
SPM-119	E-SPM-69	A	1	4	1	4	add 'This Synthesis Report, based on the assessment carried out by the three Working Groups of the Intergovernmental Panel on Climate Change (IPCC), provides an updated view of climate change as the final integrated product of the Fourth Assessment Report.' (Suam Kim, Pukyong National University)	Insufficient value in such a statement given space limitations.
SPM-120	E-SPM-72	A	1	5	1	5	Add 1 before Observed... (Annick Douguédroit, Université de Provence)	Done.
SPM-121	E-SPM-71	A	1	5	2	6	This section should also refer to Figure SPM-2 which gives a much more comprehensive picture of the change in global temperatures that have occurred than is given by Figure SPM-1, which should still be retained. It demonstrates an important aspect of the global warming that is hardly commented upon. This is the assymetry of the warming with the greatest warming occurring in the Arctic and the least in the Antarctic. This is important for 2 reasons. One is that as shown in a later section this mimics what the models predict, which provides a powerful argument for in favour of anthropogenic causes for the global change in temperature - ie it is not just that the average global temperature temperature is rising as predicted by the models, but it is following a geographic pattern that is also predicted by the models. Secondly it explains to some extent why currently climate change is viewed as more significant by northern hemisphere countries, and why, for instance, many ordinary Australians have become rather sceptical of many of the claims, because although the Australian climate has shown change, to date it can all be explained by natural climate variability. Recognising the assymetry of the changes will be important in convincing many ordinary Australians, particularly the older generations who have experienced several cycles of droughts and flooding rains, that while the changes may be less apparent now in Australia, they will still be very significant in the longer time periods, and mainly negative due to a forecast increase in aridity in an already dry country. (George Walker, Aon Re Asia Pacific)	Reference to Figure SPM-2 included in this section.
SPM-122	E-SPM-70	A	1	5	3	30	This summary of the observed changes is unduly truncated and has lost vital information. The fact that many of the recent observed changes are now modeled and identified as being associated with human climate change is lost and so is the fact many effects are already being felt. This is dealt with to some extent on page 3 using the WG II material but the record for impacts is short and not much can be said. A lot more can be said using the physical	Agreed. Description of observed changes increased using Topic 1 text. Deleted section on description of things that haven't changed.

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							evidence. I urge that the material on page 1 be expanded as in Topic 1 (even there it is unduly truncated) but that the material on page 3 from lines 9 to 30 on some things that have not changed be curtailed. There is no balance to this material. For instance, there is no sense of physical consistency or that heavy rainfall is linked to increased water vapor (which also provides greenhouse feedback). The "unequivocal" headline statement is built on many facets of evidence, and not just those named. (Kevin Trenberth, NCAR)	
SPM-123	G-SPM-50	A	1	6	1	6	A 'context setting' piece is needed here as with the other SPMs. It is too abrupt just to launch right into the findings. There is ample text to draw on from the WG SPMs and technical summaries. Some suggested text for this section, drawn from Technical Summary TS.3 (Observations of CC), is: "This assessment evaluates changes in the Earth's climate system, consisting not only of the atmosphere, but also the ocean, the land, the cryosphere and the biosphere. The consistency of observed changes among different components of the climate system allows an increasingly comprehensive picture to be drawn of climate change and its effects." This introduction should also provide some information on what's new since the TAR. Suggest: SYR Topic 1, page 1, lines 7 to 11. (Government of Canada)	Space limitations prevent introductory paragraphs; insufficient value in such a statement.
SPM-124	G-SPM-1	B	1	6			Insert at line 6 an introductory paragraph for the whole of this section – for example: Over the last 100 years and especially in the second half of this period widespread changes in climate have been observed. These include an almost universal warming, near the surface of the earth, which is greatest over land and in the Arctic, and changes in rainfall patterns and the occurrence of extreme events. Sea levels have increased, whilst land and sea ice has receded and river flows have changed. Many changes have been observed in plant and animal behaviour and there is some evidence that human activities have been affected, particularly in the Arctic. At the same time concentrations of greenhouse gases in the atmosphere have risen significantly as has the atmospheric burden of air-pollution related aerosols and other particles. These are closely related to the growth in emissions of greenhouse gases and air pollutants from human activities such as energy use in the home and by industry, travel and food production. (Government of United Kingdom)	Suggestion is not an introduction but a summary. It is not appropriate to present a summary of the summary.
SPM-125	E-SPM-74	A	1	7	1	7	Replace "is unequivocal" with "alternates with cooling" (Vincent Gray, None)	Rejected; finding is approved WGI SPM wording.
SPM-126	E-SPM-76	A	1	7	1	7	Delete 'unequivocal', revising the sentence to: "Warming of the climate system is now evident from ..." (Claire Parkinson, NASA Goddard Space Flight Center)	Rejected; finding is approved WGI SPM wording.
SPM-127	E-SPM-77	A	1	7	1	7	Delete "now"	Rejected; finding is approved WGI SPM wording.

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							(Vincent Gray, None)	
SPM-128	E-SPM-78	A	1	7	1	7	...is unequivocal add: since the last century (It is the beginning of the summary; the topic must be defined precisely. (Annick Douguédroit, Université de Provence)	Rejected; finding is approved WGI SPM wording.
SPM-129	G-SPM-52	A	1	7	1	7	Many readers may not be familiar with the term "unequivocal". Consider to replace it with a more familiar term. . (Government of Norway)	Rejected; finding is approved WGI SPM wording.
SPM-130	E-SPM-73	A	1	7	1	9	Would add changing wind patterns under this initial listing of observations; being an extremely important indicator of climate instability as well as a link to impacts. (Paul Epstein, Harvard Medical School)	Rejected; selection of most important indicators is based on approved WGI SPM.
SPM-131	G-SPM-51	A	1	7	1	26	Suggest authors provide more context for these observed changes. (Government of United States)	Rejected due to space limitations; headline is fairly clear and sets the scene.
SPM-132	E-SPM-75	A	1	7	1	36	page 1 appears as not completely organized. It mixes up warming and effects on snow, ice and sea level. Warming: 11-14, 16-19, 27-33 and 35-36. Effects: 22-25. I suggest to separate the two topics in the following way.7-8: Warming...ocean temperatures. It will be followed by the present paragraphs 11-14, 16-19, 27-33 and 35-36, which will become 11-14, 16-19, 21-27 and 29-30. And in 32-33 in bold: Warming is also evident from observations of widespread melting ...sea level (lines 8-9) followed by present 22-25 becoming 35-38. (Annick Douguédroit, Université de Provence)	Section has been reordered.
SPM-2127	E-SPM-1	D	1	7			It is worth stating that there have been some cooler periods as clearly shown in Figure 1 (1890s to 1920s). Also, regional differences in ocean heating need to be commented upon (i.e. North East Atlantic went through a cooler period between 1962 and 1987). Some references to changes in sea temperature would be valuable and could be added to Figure SPM-1. (Stephen Hawkins, Marine Biological Association of the UK)	Too much detail within space limitations; Figure SPM-1 shows temperature variations over time.
SPM-133	E-SPM-80	A	1	8	1	8	Insert after "melting" "and freezing" (Vincent Gray, None)	Rejected; finding is approved WGI SPM wording.
SPM-134	E-SPM-81	A	1	8	1	8	Insert after "increases" "and decreases" (Vincent Gray, None)	Rejected; finding is approved WGI SPM wording.
SPM-135	E-SPM-82	A	1	8	1	8	I suggest you add " ground temperature" after "increases in global average air" .. and ocean temperatures. (Hugo Beltrami, St. Francis Xavier University)	Rejected; selection of indicators is based on approved WGI SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-136	E-SPM-83	A	1	8	1	9	I am missing permafrost in the list (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected; selection of indicators is based on approved WGI SPM.
SPM-137	E-SPM-79	A	1	8	1	17	please provide more information or make some correction about the following three things: global average air and ocean temperatures, Global mean surface temperature, surface air temperatures over land. (Bangzhong Wang, China Meterological Administration)	Text checked for consistency.
SPM-138	G-SPM-53	A	1	8	1	23	There is a lack of consistency, see "global average air temperature" vs "global mean surface temperature", "global average ocean temperature" vs "global ocean heat content" and "global mean sea level" vs "global average sea level". (Government of Norway)	Text checked for consistency.
SPM-139	G-SPM-2	B	1	8			Please clarify if Fig SPM-1 shows global average air temperature or surface temperature. (Government of United Kingdom)	Global average surface temperature is specified in figure caption.
SPM-140	E-SPM-84	A	1	9	1	9	Replace "rising" with "changes in" (Vincent Gray, None)	Rejected; finding is approved WGI SPM wording.
SPM-141	G-SPM-54	A	1	9	1	9	Authors should be consistent and careful in using the terms "mean" and "average", consistent with the WG1 SPM. (Government of United States)	Text checked for consistency.
SPM-142	E-SPM-91	A	1	11	1	11	Same as above [TSU note: See comment E-1-43-A] (Marcos Gomes, Pontifical Catholic University of Rio de Janeiro)	Wording revised.
SPM-143	E-SPM-93	A	1	11	1	11	Insert after "temperature" "as measured by the unreliable surface compilation" (Vincent Gray, None)	Rejected; no support provided for suggestion; inconsistent with WGI assessment.
SPM-144	E-SPM-94	A	1	11	1	11	I suggest deleting "with a linear trend." This is not as important as the amount of observed warming and invites quibbling over whether, for example, the bump around 1940 is a departure from linearity. (Daniel Murphy, NOAA Earth System Research Laboratory)	Wording revised.
SPM-145	E-SPM-95	A	1	11	1	11	I seriously doubt that temperature increase is linear. It is extremely non-linear (see temperature curves) with high acceleration of warming rate in the last decades. Increase in warming rate is a key message (Markus Erhard, European Environment Agency)	Wording revised.
SPM-146	E-SPM-98	A	1	11	1	11	delete "with a linear trend of" (Hugo Beltrami, St. Francis Xavier University)	Wording revised.

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SPM-147	E-SPM-100	A	1	11	1	11	Change "with a linear trend of" to "by" as this is an increase and not really a rate. (Michael MacCracken, Climate Institute)	Wording revised.
SPM-148	E-SPM-102	A	1	11	1	11	[TSU note: See Comment E-SPM-101-A] Once this sentence is rearranged in some form, it will probably be necessary to clarify the units, deg-C/century (rather than just deg-C) (Mark Lawrence, Max Planck Institute for Chemistry)	Wording revised.
SPM-149	E-SPM-103	A	1	11	1	11	...trend of 0,74 [0,56to0,92] ...is not easy to understand; add a trend of 0,74 as better estimate (between 0,56 and 0,92) ... (Annick Douguédroit, Université de Provence)	Meaning of square brackets is clarified in footnote.
SPM-150	G-SPM-1	C	1	11	1	11	The word 'trend' implies a change over a unit time interval (e.g., per year, per decade...). The expression 'linear trend' suggest that the temperature increase has been linear over the last 100 years, should rather say 'linearised trend', and explain that the real increase is not linear. "Would it be more appropriate to simply write: '...has increased by 0.74 [0.56 to 0.92]°C over the last 100 years." (Government of Belgium)	Wording revised.
SPM-151	G-SPM-2	C	1	11	1	11	For consistency of text with Figure SPM-1 caption, choose consistently either 'global mean' or global average. (Government of Belgium)	Text checked for consistency.
SPM-152	E-SPM-86	A	1	11	1	12	The sentence could be reworded, as it reads as if global surface temperature has increased linearly, which is not the case. Two alternatives, the first more general than the second, are "Global mean surface temperatures in the first few years of the 21st century were almost 1deg C higher than they were a hundred years ago" and "A linear fit to the global mean surface temperature record gives a trend of 0.74[0.56 to 0.92] deg C over the last hundred years (1906-2005)" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Wording revised.
SPM-153	E-SPM-87	A	1	11	1	12	The sentence as currently written states that there has been a linear trend in temperature. Reference to Figure SPM-1 shows that this is not true; the trend is accelerating (see comments on Topic 1). It would be true to say that global mean surface temperature has increased at an average rate of 0.74 degC per century over the period 1906 to 2006. (Archie McCulloch, University of Bristol)	Wording revised.
SPM-154	E-SPM-96	A	1	11	1	12	I find the phrase "with a linear trend of" confusing for the readership. This refers to a technical detail, but may be misunderstood by readers that the temperature was linearly raising during the last century (which is of course not the case). (Andreas Fischlin, Integrative Biology - Systems Ecology)	Wording revised.
SPM-155	E-SPM-101	A	1	11	1	12	As written, the phrase "has increased with a linear trend" will probably be mis-read by a non-negligible part of the audience to indicate that the temperature increase itself has been linear (rather than the values just indicating the slope of the regression). This is very important to	Wording revised.

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							improve. One possibility to avoid this would be to use the wording from the next paragraphs ("average rate"): "Global mean surface temperature has increased at an average rate of 0.74..." Alternatively, it could be rearranged as "Global mean surface temperature has increased over the last 100 years (1906-2005), with a linear fit to the data of 0.74...". (Mark Lawrence, Max Planck Institute for Chemistry)	
SPM-156	G-SPM-56	A	1	11	1	12	Editorial comment: add a COMMA after the word INCREASED so that the phrase about the linear trend is read together with the phrase about 100 years. (Government of Canada)	Wording revised.
SPM-157	G-SPM-57	A	1	11	1	12	Add the phrase from the WGI SPM "The linear warming trend over the last 50 years (give numbers) is nearly twice that of the last 100 years." The result will be of particular importance to policymakers because it indicates that an increasing rate of warming has persisted for some time. This adds context to the subsequent sentence about 11 of the last 12 years being among the warmest on record. (Government of Canada)	Too much detail for limited space. Information can be derived from Figure SPM-1.
SPM-158	G-SPM-55	A	1	11	1	14	It would be helpful to mention as well that the updated 100-year warming trend in the AR4 (0.74°C) is much larger than in the TAR (0.6°C). [WG1 TS3.1.1]. Furthermore it might be useful to add or replace by a comparison with pre-industrial levels because later on in the text, when mitigation scenarios are discussed, comparison is made with pre-industrial levels. (Government of European Community)	Too much detail for limited space.
SPM-159	E-SPM-90	A	1	11	1	20	Somewhere here the rate of warming over the last few decades should be given--this more clearly indicates what is happening now--so 0.2 C/decade or a rate of 2 C/century--a clear acceleration from the average for the 20th century. (Michael MacCracken, Climate Institute)	Too much detail for limited space. Information can be derived from Figure SPM-1.
SPM-160	E-SPM-92	A	1	11	1	20	Mixing land temps, water temps, statements of linearity and examples of non-linearity makes these two paragraphs a bit confusing. (John Nyboer, Simon Fraser University)	Text revised.
SPM-161	E-SPM-85	A	1	11	1	24	There is a superscript 1 which is repeated and looks like it is part of the units. It is confusing (Kevin Trenberth, NCAR)	Footnote marker is clearly separated from unit C. Repetition removed.
SPM-162	E-SPM-88	A	1	11	1	24	The callout for footnote 1 is first on line 11, then repeated on lines 23 and 24; it either needs to be repeated on line 19 (after the %) as well for consistency, or removed from lines 23 and 24 (Mark Lawrence, Max Planck Institute for Chemistry)	Repetition has been removed.
SPM-163	E-SPM-99	A	1	11	1	25	Confusing mixture of trend units: temperature over 100 years, regional temperatures per decade since 1978, sea level rise per year for different periods.	Text revised.

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							(Joanna Haigh, Imperial College)	
SPM-164	E-SPM-89	A	1	11			Suggest deleting "linear" as disputable. (Volodymyr Demkine, UNEP)	Wording revised.
SPM-165	E-SPM-97	A	1	11			Global mean surface temperature: one very naturally asks himself: "air or ocean?" This becomes clear only when air and ocean temperature are discussed separately later on. (Michel Rixen, NATO Undersea Research Center)	Global mean surface temperature covers both land and ocean.
SPM-166	G-SPM-3	B	1	11			The WG1 SPM quotes 0.76. Suggest adjusting to make consistent (Government of United Kingdom)	Rejected; the linear trend is 0.74, consistent with WGI SPM.
SPM-167	G-SPM-4	B	1	11			Non-bold paragraphs 1,2 and 5 are all on temperature - suggest that they could be better combined into 2 paragraphs. Suggest redraft to make clearer Para 1 "Global mean surface temperature has increased by 0.74 [0.56 to 0.92] C over the last 100 years (1906-2005) with a linear trend to the increase. Eleven of the past twelve years to 2006 rank among the warmest twelve years on record. The warming is widespread over the globe, with the greatest warming at higher northern latitudes. It is very likely that the second half of the 20th century was the warmest 50-year period for the Northern Hemisphere in the past 500 years."...para 2 could then be "Global ocean heat content... .. added to the climate system. On average, surface... decade since 1978." (Government of United Kingdom)	Text revised.
SPM-168	E-SPM-105	A	1	12	1	12	Same as above [TSU note: See comment E-1-31-A] (Marcos Gomes, Pontifical Catholic University of Rio de Janeiro)	Rejected; approved WGI SPM wording.
SPM-169	E-SPM-106	A	1	12	1	12	In the setence, "The warmest eleven of the past twelve years to 2006.....", it should be made clear that the period of consideration is from 1850 (Richard Anyah, Rutgers University)	Accepted.
SPM-170	E-SPM-108	A	1	12	1	12	..over the last 100 years (1906-2005). In fact warming happened during two periods: till the 40's and since the 70's; only the second period is the "climate change" period and references are done further only on decades after the 70's. Could we add : "Warming happened during two periods, at the beginning of the century and since the 70's, the second one extending presently and being the so-called "man-induced period". (Annick Douguédroit, Université de Provence)	Too much detail, changes over time can be derived from Figure SPM-1.
SPM-171	G-SPM-58	A	1	12	1	12	We suggest to replace "Over the last 100 years (1906-2005)" by "Over the last 100 year period of 1906-2005". Rationale: Since the AR4 is to be completed by the end of 2007, the last 100 years referring to this year (2007) is 1907-2006 instead of 1906-2005. So this suggestion makes clear the period reference. (Government of Republic of Benin)	Wording revised.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-172	G-SPM-59	A	1	12	1	12	Note that this document will be relevant at least until AR5 is released, we suggest for clarity of dates, to use the wording from WGI SPM: "Eleven of the last twelve years (1995-2006) rank among the 12 warmest years on record". (Government of Canada)	Checked text. Revised.
SPM-173	G-SPM-60	A	1	12	1	12	For comparability with other information please insert following sentences: The total temperature increase from 1850-1899 to 2001-2005 is 0.76 [0.57 to 0.95] °C. (Government of Germany)	Too much detail.
SPM-174	E-SPM-104	A	1	12	1	13	This sentence is gobbledygook. Either "Eleven of the past twelve years to 2006 rank among the warmest on record" or "The past twelve years to 2006 rank among the warmest twelve year period on record". (Archie McCulloch, University of Bristol)	Rejected; approved WGI SPM wording and proposals do not make sense.
SPM-175	E-SPM-107	A	1	12	1	13	Hard to understand. Why not "Eleven out of the past twelve years (up to 2006) rank among the warmest on record." (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected; approved WGI SPM wording and proposals do not make sense.
SPM-176	E-SPM-109	A	1	13	1	13	warmest eleven years (Stephan Halloy, Conservation International)	Rejected; approved WGI SPM wording.
SPM-177	E-SPM-111	A	1	13	1	13	The time frame for this change is not given. Please add "since 1850". (Kevin Trenberth, NCAR)	Accepted.
SPM-178	E-SPM-113	A	1	13	1	13	the connection with "and" between the two parts of the sentence appears not logical. Please rewrite the sentence and specify the effects of an increase in the global ocean heat content (Gesa Weyhenmeyer, Environmental Assessment)	Statement deleted for space reasons.
SPM-179	E-SPM-116	A	1	13	1	13	please specify "Global ocean heat content increased by x % [x to y] (Gesa Weyhenmeyer, Environmental Assessment)	Statement deleted for space reasons.
SPM-180	E-SPM-117	A	1	13	1	13	Insert after "record" " but there has been no overall change since 1998" (Vincent Gray, None)	Rejected; year to year variability not relevant in this context.
SPM-181	E-SPM-119	A	1	13	1	13	delet "twelve" otherwise sentence is unclear (Peter Berry, Health Canada)	Rejected; approved WGI SPM wording.
SPM-182	E-SPM-122	A	1	13	1	13	add (since 1850) after "on record". (Janice Lough, Australian Institute of Marine Science)	Accepted.
SPM-183	G-SPM-61	A	1	13	1	13	We suggest to insert here the lines 35-36 of the same page 1, which are also relative to temperature.. (Government of France)	Accepted.

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SPM-184	G-SPM-63	A	1	13	1	13	Please quantify the increase in heat content. (Government of United States)	
SPM-185	G-SPM-64	A	1	13	1	13	Please add after "Global ocean heat content increased" the important information "to depth of at least 300m". (Government of Germany)	Added to Topic 1 but statement deleted from revised SPM.
SPM-186	G-SPM-65	A	1	13	1	13	Delete "on record" and insert "in the instrumental record of global surface temperature (since 1850)," consistent with Topic 1.1, lines 28-29, p. 1. (Government of United States)	Added "1850", rest of wording too detailed for SPM.
SPM-2128	E-SPM-2	D	1	13	1	13	How much has the globla ocean heat content increase by? This needs quantifying here. (Stephen Hawkins, Marine Biological Association of the UK)	Statement deleted for space reasons.
SPM-187	E-SPM-110	A	1	13	1	14	This sentence is not clear and should be rephrased. (Marco Mazzotti, ETH Zurich)	Statement deleted for space reasons.
SPM-188	E-SPM-114	A	1	13	1	14	Suggest change of last sentence to read : "All climate subsystems (atmosphere, continental surface, cryosphere, and oceans have gain heat over 1961-2003. The ocean however takes up over 80% of the heat added to the climate system (Hugo Beltrami, St. Francis Xavier University)	Statement deleted for space reasons.
SPM-189	E-SPM-115	A	1	13	1	14	Replace from "and" on line 13 to "system" on line 14 with "but the temperature is now falling." (Vincent Gray, None)	Rejected; incorrect as expression of long-term trend.
SPM-190	E-SPM-118	A	1	13	1	14	Difficult to follow logic. I suggest to move the sentence "Global ocean heat content increased over 1961-2003, and the ocean is taking up over 80% of the heat being added to the climate system." to sentence ending in line 18, i.e. "... ocean rate after 1979". (Andreas Fischlin, Integrative Biology - Systems Ecology)	Statement deleted for space reasons.
SPM-191	G-SPM-62	A	1	13	1	14	This sentence about the ocean heat content reads as though the ocean has ONLY heated over the 1961-2003 period. We suggest using the sentence from the WG1-SPM page 5: Observations since 1961 show that the average temperature of the global ocean has increased to depths of at least 3000 m and that the ocean is taking up over 80% of the heat added to the climate system. (Government of Canada)	Added to Topic 1 but statement deleted from revised SPM.
SPM-192	E-SPM-112	A	1	13			The text on "global ocean heat content" has to be consistent with AR4 WG 1 Chapter 5 which refers to "the 0 to 700 m layer" (See Figure 5.1 on global annual ocean heat content) (Volodymyr Demkine, UNEP)	Statement deleted for space reasons.
SPM-193	E-SPM-120	A	1	13			add since 1850. (Mustafa Babiker, Saudi Aramco)	Accepted.

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SPM-194	E-SPM-121	A	1	13			Add '(since 1850)' after 'record' (Javier Martin-Vide, Group of Climatology)	Accepted.
SPM-195	G-SPM-66	A	1	13			add since 1850. (Government of Kingdom of Saudi Arabia)	Accepted.
SPM-196	E-SPM-123	A	1	14	1	14	The fact that "the ocean is taking up more than 80% of the heat" isn't useful unless the equivalent past percentage is quoted for comparison. (David Jackson, McMaster Institute for Energy Studies)	Statement deleted for space reasons.
SPM-197	E-SPM-124	A	1	14	1	14	Ocean takes up 80% of the heat but ocean represents 72 % of the globe surface; it is probably unknown by the Policymakers. So could we add " ...ocean covering 72% of the globe surface is taking over... (Annick Douguédroit, Université de Provence)	Statement deleted for space reasons.
SPM-198	G-SPM-68	A	1	14	1	14	Has the ocean taken up more than 80% during 1961-2003, right now, or now and forever? (Government of Sweden)	Statement deleted for space reasons.
SPM-199	G-SPM-67	A	1	14			Some data on ocean temperature rise could be included here. (Government of Ireland)	Statement deleted for space reasons.
SPM-200	E-SPM-125	A	1	15			glacier lakes appear here first time in this summary for policy makers. Glacier lakes are totally uncommon for the public. Most people can guess what it is, but I think that it is hard to give exact idea what it is. Give more information about glacier lakes. For example, "increased the number and volume of periglacial lakes that can potentially cause flood" (Kenichi Matsuoka, University of Washington)	No reference to glacier lakes here.
SPM-201	E-SPM-127	A	1	16	1	16	sentence is unclear - what does "with a maximum at higher northern latitudes mean"? with great warming at higher northern latitudes??? (Peter Berry, Health Canada)	Text revised.
SPM-202	E-SPM-128	A	1	16	1	16	Replace "The warming to "at" with There is a warm spell" (Vincent Gray, None)	Rejected; there is a clear long-term warming trend and consistent pattern.
SPM-203	E-SPM-129	A	1	16	1	16	Insert after "latitudes" "and a prolonged cooling over the Antyartic" (Vincent Gray, None)	Insufficient observations to support assertion; Antarctic Peninsula shows strong warming trend.
SPM-204	E-SPM-130	A	1	16	1	16	I would replace 'higher' with 'high'. There is no comparison with low latitudes here. (Nathan Gillett, University of East Anglia)	Text revised, comparison is now more explicit.

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SPM-205	G-SPM-69	A	1	16	1	16	Topic 1, p. 1, line 36: "and is a maximum" (referring to warming) reads, "with a maximum" in the SPM. Changing all statements to read "with" is suggested. (Government of Japan)	Agreed. Text revised.
SPM-206	G-SPM-71	A	1	16	1	16	Is it worthwhile to note that this does not include Antarctica? The WG1 SPM states, "It is likely that there has been significant warming over the past 50 years averaged over each continent except Antarctica." (Government of United States)	Comment refers to attribution, not observation. Topic 1 is on observations.
SPM-207	E-SPM-131	A	1	16	1	18	delete first sentence. Start paragraph with On average.. (Hugo Beltrami, St. Francis Xavier University)	Rejected. no reason provided.
SPM-208	G-SPM-70	A	1	16	1	18	The sentence is somewhat unclear and difficult to comprehend. We propose to rewrite to: "On average, surface air temperatures over land have risen at about twice as fast at ocean temperatures after 1979." (Government of Norway)	To much detail.
SPM-209	G-SPM-72	A	1	16	1	18	do the statements appear anywhere in the SPM of WGI? (Government of Kingdom of Saudi Arabia)	Some yes, others can be found in Technical Summary.
SPM-210	E-SPM-126	A	1	16	5	23	This comment applies even more generally to Topic 1. The term "warming" is used here p 1 line 16 and p 5 line 23 but must be changed to "temperature increase". Elsewhere, in the section on radiative forcing (such as p 5 line 12), the term warming has units of Watts per meter squared and refers effectively to heating. Here it does NOT mean this and it should be explicit and limit the terminology to be "temperature increase" which is only one facet of warming. In fact there probably has been warming over Antarctica from increased CO2 but there not been temperature increase! (Kevin Trenberth, NCAR)	Taken into account to reduce possible misunderstanding. We note though that "warming" is generally used in its intransitive sense, not the transitive sense as implied by the reviewer. The current wording is therefore also correct.
SPM-211	E-SPM-132	A	1	17	1	17	The phrase 'about double the ocean rate' is not clear. Is that double the rate of warming of the ocean or double the rate of the atmosphere over the ocean? (Roger Street, UKCIP-OUCE)	Text revised to clarify.
SPM-212	G-SPM-73	A	1	17			Rate of increase values could be included text could read "since" rather than "after" (Government of Ireland)	Text revised.
SPM-213	E-SPM-133	A	1	18	1	19	Can the sentence 'Average Arctic temperatures ...' be more carefully phrased? 'twice the global average rate' may not be easy to understand (Andy Morse, University of Liverpool)	Sentence about Arctic warming removed.
SPM-214	G-SPM-74	A	1	18	1	20	The SPM states: "Average Arctic temperatures increased at almost twice the global average rate over the past 100 years, and Arctic sea ice extent reduced by 2.7 [2.1 to 3.3]% per decade since 1978. {1.1}" This sentence is confusing in that it combines two distinct periods ("past 100" years and "since 1979") and distinct trend ("temperature" and	Sentence about Arctic warming removed.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							“sea ice”). It also ignores the 1925 to 1945 warming period. Suggest changing to: “Average Arctic temperatures, with some decadal variability, increased at almost twice the global average rate over the past 100 years. Since 1978, Arctic sea ice extent has declined by 2.7 [2.1 to 3.3]% per decade. {1.1}” (Government of United States)	
SPM-215	E-SPM-135	A	1	19	1	19	Period after “100 years”, delete “and”, and replace “reduced” with “has decreased”. (Daniel Murphy, NOAA Earth System Research Laboratory)	Sentence about Arctic warming removed.
SPM-216	E-SPM-136	A	1	19	1	19	Perhaps include “average annual” in the Arctic sea ice trend to differentiate this from the larger and more frequently mentioned summer trend. (Daniel Murphy, NOAA Earth System Research Laboratory)	Summer melting has been added.
SPM-217	E-SPM-140	A	1	19	1	19	change “reduced” to “decreased” (Janice Lough, Australian Institute of Marine Science)	Accepted.
SPM-218	E-SPM-141	A	1	19	1	19	“reduced” is poor English; better: ‘shrank’ (Jon Egill Kristjansson, University of Oslo)	Accepted.
SPM-219	G-SPM-75	A	1	19	1	19	Suggest changing “reduced” to “declined”. (Government of Japan)	Wording revised.
SPM-220	G-SPM-76	A	1	19	1	19	Delete “, and Arctic sea ice extent reduced by 2.7 [2.1 to 3.3] % per decade”, because this is the typical magnitude of many natural variations in the climate system, and therefore this statement is to much detail here (Government of Netherlands)	Approved WGI SPM content.
SPM-221	G-SPM-77	A	1	19	1	19	Change “reduced” to “declined”. (Government of United States)	Wording revised.
SPM-222	G-SPM-78	A	1	19	1	20	add: “with larger decreases in summer of 7.4 [5.0 to 9.8]% per decade.” This addition seems important as reporting only the average annual Arctic sea ice extent decrease does not convey all the important changes in the Arctic. Reductions in summer sea ice extent have many implications for residents of the North and for Arctic sea-ice dependent fauna. (Government of Canada)	Agreed. Text added.
SPM-223	E-SPM-134	A	1	19			replace “reduce” by “declined” (Rolf Mueller, Research Centre Juelich)	Wording revised.
SPM-224	E-SPM-137	A	1	19			Footnote 1 should go here (Rolf Mueller, Research Centre Juelich)	Footnote only used at first instance and applies throughout document.

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SPM-225	E-SPM-138	A	1	19			extent ice is highly technical, maybe replace with standing ice? (Peter Haas, University of Massachusetts)	This is a standard expression, used in WGI SPM.
SPM-226	E-SPM-139	A	1	19			change reduced to fell (Peter Haas, University of Massachusetts)	Wording revised.
SPM-227	E-SPM-142	A	1	20			Arctic sea ice: might be interesting to state how much TOTAL ice extent reduction for 1978 till present (Michel Rixen, NATO Undersea Research Center)	This can be derived from the rate; giving rate of change is consistent with its presentation in WGI SPM.
SPM-228	G-SPM-5	B	1	20			Add "with larger decreases in summer (-7.4%)" (Government of United Kingdom)	Accepted.
SPM-229	E-SPM-143	A	1	22	1	22	This is all well said. (Michael MacCracken, Climate Institute)	Thank you.
SPM-230	E-SPM-145	A	1	22	1	22	I suggest adding that increases in water vapour have been observed since this is also consistent with the warming. (Richard Allan, University of Reading)	Too detailed for SYR SPM
SPM-231	E-SPM-147	A	1	22	1	22	delete complete line (Hugo Beltrami, St. Francis Xavier University)	Rejected; no reason given.
SPM-232	G-SPM-79	A	1	22	1	22	To keep consistent with Topic 1, suggest to add "on average" after "declined". (Government of China)	Accepted.
SPM-233	G-SPM-81	A	1	22	1	22	Replace the expression "mountain glaciers" by "continental glaciers" (Government of Switzerland)	Rejected, WGI SPM wording.
SPM-234	G-SPM-83	A	1	22	1	22	Please give time frame of glacier and snow cover changes. (Government of United States)	Start date for data varies widely with region. Lack of space precludes including all this detail. Declines have been observed from whenever data commences.
SPM-235	G-SPM-3	C	1	22	1	22	Confusing: do you mean declined or retreated, shrunk in extent ? (Government of Belgium)	Declined, consistent with WGI SPM.
SPM-236	E-SPM-146	A	1	22	1	25	Given the overall importance of water availability, a statement on the impact of change in ground water on sea level should appear in the SPM; especially on the uncertainties (Michael Manton, Monash University)	Too detailed for SPM; meaning of comment not entirely clear.
SPM-237	G-SPM-80	A	1	22	1	25	should also note as in SPM1 that it is unclear whether the faster rate of the sea level rise during 1993-2003 is an increase in the longer term trend or due to decadal variability. (Government of Kingdom of Saudi Arabia)	Agreed. Text added.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-238	G-SPM-82	A	1	22	1	25	Please provide the budget estimates for each of the three contributions. (Government of United States)	Too detailed for SPM, space limitations.
SPM-239	G-SPM-4	C	1	22	1	25	" Indicate also the end of the period assessed (2003?) (i.e. from 1993 to 2003 at a rate of...)" (Government of Belgium)	Accepted, added in following sentence.
SPM-240	E-SPM-144	A	1	22			Suggest insert "have" before "declined" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	accepted.
SPM-241	E-SPM-148	A	1	23	1	24	use of supra indices already stated (Monica Beatriz Wehbe, National University Rio Cuarto)	Removed.
SPM-242	E-SPM-149	A	1	24	1	24	..at 3,1 [2,4 to 3,8]. Same remark as for line 11 (Annick Douguédroit, Université de Provence)	same response as for line 11.
SPM-243	G-SPM-6	B	1	24			Add "of the oceans" after expansion (Government of United Kingdom)	Context makes it clear that this is what is referred to.
SPM-244	E-SPM-150	A	1	25	1	25	This text could be taken to imply that the contribution from the Antarctic ice sheet is definitely positive, but it is uncertain and could be negative or zero. (Nathan Gillett, University of East Anglia)	Replaced "Greenland and Antarctic ice sheets" with "polar ice sheets".
SPM-245	E-SPM-152	A	1	25	1	25	The doubts about the contribution of Antarctica expressed later are not reflected here - see SPM p.4 L 11-12 and p.5 L 24. (David Jackson, McMaster Institute for Energy Studies)	Replaced "Greenland and Antarctic ice sheets" with "polar ice sheets".
SPM-246	E-SPM-153	A	1	25	1	25	Here it is written that Antarctic ice sheets melt but on page 4 lines 11-12 it is said that Antarctic sea ice extent shows no statistically significant average trend. This needs to be specified. (Gesa Weyhenmeyer, Environmental Assessment)	Misunderstanding between ice sheet and sea ice; no change.
SPM-247	E-SPM-151	A	1	25			This statement is in contrast with p. 4, l. 11-12 where it is stated that there is no trend in Antarctic ice sheets. (Rolf Mueller, Research Centre Juelich)	Misunderstanding between ice sheet and sea ice; no change.
SPM-248	G-SPM-84	A	1	25			is the Antarctic ice sheet really melting? 1.1 says on the large uncertainty in this regard. (Government of Russian Federation)	Replaced "Greenland and Antarctic ice sheets" with "polar ice sheets".
SPM-249	G-SPM-7	B	1	25			Please note also decline in area of permafrost (Government of United Kingdom)	Too much detail for space limited SPM.
SPM-250	E-SPM-156	A	1	27	1	27	Switch "continental" and "regional" to arrive at a more logical progression of spatial scale. (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Wording removed for space reasons.
SPM-251	G-SPM-88	A	1	27	1	27	The sentence should be made consistent with the text in WG I SPM and we suggest the following rewrite: " Numerous changes have been observed at continental, regional and	Wording removed for space reasons.

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							ocean-basin scale including widespread changes in persipitation amounts, a likely increase in heavy percipitation" (Government of Norway)	
SPM-252	G-SPM-89	A	1	27	1	27	suggest writing "Climate change at continental" instead of "Change at continental" (Government of Republic of Korea)	Wording removed for space reasons.
SPM-253	E-SPM-154	A	1	27	1	28	With respect to 'long-term trends in precipitation' would be more meaningful if less vague. What type of trends? (Roger Street, UKCIP-OUCE)	Accepted, trends are now described.
SPM-254	E-SPM-155	A	1	27	1	28	This summary is so truncated as to be useless. Saying there are long-term trends in precipitation without saying that they are positive at high northern latitudes and negative in the subtropics is misleading at best. (Kevin Trenberth, NCAR)	Agreed. Regional descriptions added.
SPM-255	E-SPM-157	A	1	27	1	30	not all clauses have probabibility estimates (Peter Haas, University of Massachusetts)	Noted, only clauses with probability estimates retained.
SPM-256	E-SPM-158	A	1	27	1	33	It would be useful to note that coasts, small islands and vulnerable coastal ecosystems (bays, delta, estuaries, lagoons) are most affected by drought, increased precipitation and flooding, and erosion, particularly the Mediterranean and Caribbean regions. Please also see the EU Green Paper on dAapting to Climate Change in Europe (discussed in general comments). (Magdalena Muir, Environmental and Legal Services Ltd.)	Not relevant for topic 1; comment refers to projections.
SPM-257	E-SPM-160	A	1	27	1	33	delete all these lines since the issue here is changes in precip and this pops up again later. (Hugo Beltrami, St. Francis Xavier University)	Rejected; this is the only place where changes in precipitation are described.
SPM-258	E-SPM-162	A	1	27	1	33	Although this paragraph is clear, it does not fall cleanly within the scope of the boldface topic that introduces this section. The general topic is that warming is occurring. The specific lines to which I refer go beyond that to projections of likely consequences of warming in the future. Given that this document is a synthesis and a summary -- something that should be able to be scanned and digested quickly -- these lines would be better placed under a heading that specifically addresses likely trends in the future. (Noel Gurwick, Carnegie Institution)	Rejected; statements are all about observed changes.
SPM-259	G-SPM-85	A	1	27	1	33	While the first paragraphs quantify the temperature or sea level increases, this paragraph does not indicate an order of magnitude of the observed changes;e.g. a likely strengthening of westerly winds carries no significant information, in the absence of further information : is the frequency of strong winds events increasing or the average speed of the winds? by how much? (Government of France)	Statements are consistent with key conclusions from WGI SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-260	G-SPM-86	A	1	27	1	33	There will be an increase in extremes. This is not clear for a non-specialist. Need to clarify that in some areas of the globe there will be an increase in heavy precipitation whereas in other (time and areas) there will be drought. For example the fact that the Mediterranean Basin will become even dryer should be discussed. (Government of United States)	Not all extremes increase. Reference to specific regions for specific extremes too detailed for SYR SPM.
SPM-261	G-SPM-87	A	1	27	1	33	There is inconsistency in this paragraph about whether or not results are given a likelihood. Furthermore, when a likelihood is given, it is not always clear whether or not it applies to all results in the sentence. Consistency and clarity are probably most easily achieved by omitting likelihoods in this paragraph. The WGI SPM (page 6) adopted the same approach (no likelihoods provided in the text). (Government of Canada)	Paragraph rewritten with clear delineation of likelihoods.
SPM-262	G-SPM-90	A	1	27	1	33	Please clarify modifiers of likelihood for second sentence, and consistently apply appropriate likelihoods for all of the trends. (Government of United States)	Paragraph rewritten with clear delineation of likelihoods.
SPM-263	E-SPM-159	A	1	27			describe direction of the long-term trends (Peter Haas, University of Massachusetts)	Accepted.
SPM-264	E-SPM-161	A	1	27			changes at THE continental (Peter Haas, University of Massachusetts)	Wording deleted.
SPM-265	E-SPM-166	A	1	28	1	28	Insert Ref to footnote after first occurrence of likelihood estimate (i.e "likely"). Footnote should explain standard IPCC likelihood scale as used in e.g. AR4 WG1 SPM page 3 footnote 6 (Pat Finnegan, Grian)	Accepted (applies to first paragraph of non-bold text after revisions).
SPM-266	E-SPM-168	A	1	28	1	28	add "in some regions" after "precipitation" (Janice Lough, Australian Institute of Marine Science)	Regions are now specified.
SPM-267	E-SPM-169	A	1	28	1	28	..long-term trends in precipitation, ... add: in some regions (significant long-term trends are not global) (Annick Douguédroit, Université de Provence)	Regions are now specified.
SPM-268	E-SPM-171	A	1	28	1	28	"a likely increase" - did WG I or II Summary for Policy Makers (can't remember which) not indicate heavy precipitation events would be "very likely"?? (Peter Berry, Health Canada)	<i>Likely</i> is correct for observed changes.
SPM-269	G-SPM-93	A	1	28	1	28	Replace "of westerly winds" by "of mean midlatitude westerly winds". There is some confusion because many people interpret "strengthening of westerly winds" as an increase of extreme storm frequency. However, storm frequency is likely to have increased or decreased locally depending on the poleward shift of storm tracks. (Government of Netherlands)	Statement deleted for space reasons.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-270	G-SPM-95	A	1	28	1	28	For accuracy, insert "mid-latitude" in front of "westerly winds". (Government of Australia)	Statement deleted for space reasons.
SPM-271	G-SPM-97	A	1	28	1	28	after likely: Refer to new footnote2 based on SYR Intro p3, I14-19 and SPM WG Ip4 footnote 6: "The assessed likelihood, using expert judgement, of an outcome or a result is specified as: Virtually certain >99% probability of occurrence, Extremely likely>90%, Likely>66%, More likely than not>50%, Unlikely<33%, Very unlikely<10%, Extremely unlikely<5%." (Government of Netherlands)	Footnote to clarify uncertainty language added in first para.
SPM-272	G-SPM-5	C	1	28	1	28	an important advance with respect to the TAR is the 'more likeliness' and 'more confidence'. Therefore it might be useful to refer the first time ref is made to a level confidence or a likeliness to the definitions/meaning as in Box TS.1 (Government of Belgium)	Footnote to clarify uncertainty language added in first para.
SPM-273	E-SPM-163	A	1	28	1	29	strengthening of SURFACE? (ALTITUDE?) westerly winds (Germán Poveda, Universidad Nacional de Colombia)	Statement deleted for space reasons.
SPM-274	E-SPM-164	A	1	28	1	29	strengthening westerly winds' are not global but something of the mid latitudes (Andy Morse, University of Liverpool)	Statement deleted for space reasons.
SPM-275	E-SPM-165	A	1	28	1	29	Similar to above - indicate at what level have "westerly winds" strengthened. (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Statement deleted for space reasons.
SPM-276	E-SPM-167	A	1	28	1	29	I do not understand why it is said that an increase in heavy precipitation events is only "likely" given that there are trends on most land areas--maybe what should be said is that this is the trend over land (we don't have information over the ocean)--so change "a likely" to "an" and then at the end of the sentence say "in many areas" (Michael MacCracken, Climate Institute)	Likely is the assessed confidence level, see WGI chapter 3.
SPM-277	E-SPM-172	A	1	28	1	29	"...a likely increase in heavy precipitation events and strengthening of westerly wind." It may need to indicate where they are undergoing upward trends. In eastern Asia we have not found the strengthening of westerly wind. (Guoyu Ren, National Climate Center)	Statement deleted for space reasons.
SPM-278	G-SPM-91	A	1	28	1	29	We believe that the meaning is not westerly winds, but west wind belts. (Government of Sweden)	Statement deleted for space reasons.
SPM-279	G-SPM-92	A	1	28	1	29	suggest inserting "at Mid-latitude" after westly wind. (Government of Republic of Korea)	Statement deleted for space reasons.
SPM-280	G-SPM-96	A	1	28	1	29	Consider dropping all likelihood clauses and place the qualifier in square brackets at the end of the sentence or clause. (Government of United States)	Rejected; reads less clumsy if integrated in sentence, consistent with WGI SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-281	G-SPM-98	A	1	28	1	29	Add "mid-latitude" westerly winds to be consistent with WGI and to reinforce that this is not a change to winds at the local scale. (Government of Canada)	Statement deleted for space reasons.
SPM-282	G-SPM-94	A	1	28	1	36	Please insert the footnotes for thr terminology of likelihood as "very likely", "likely".... (Government of Germany)	Footnote added.
SPM-283	E-SPM-170	A	1	28	21	16	..a likely increase ...winds. It only concerns Northern extra-tropical hemisphere. Add it? (Annick Douguédroit, Université de Provence)	Statement deleted for space reasons.
SPM-284	E-SPM-174	A	1	29	1	29	Replace "Cold days, cold nights ..." by "cool days, cool nights ..." (Serhat Sensoy, Turkish State Meteorological Service)	Rejected; terminology is as used in WGI underlying chapter and SPM.
SPM-285	E-SPM-176	A	1	29	1	29	It is really misleading to suggest that the changes here are only very likely--that is presumably because the changes are not observed everywhere--it would be much more appropriate to say that "Cold days, cold nights, and frost have become less frequent in most areas" or something similar. (Michael MacCracken, Climate Institute)	Rejected; many reviewers have requested consistent use of likelihood terminology.
SPM-286	E-SPM-177	A	1	29	1	29	Insert 'in the mid-latitudes' after 'winds'. (Nathan Gillett, University of East Anglia)	Statement deleted for space reasons.
SPM-287	E-SPM-179	A	1	29	1	29	add "since the 1960s" after "winds" (Serge Planton, Météo-France)	Statement deleted for space reasons.
SPM-288	G-SPM-99	A	1	29	1	29	add "over mid-latitudes" after "winds"; at the end of the sentence. (Government of India)	Statement deleted for space reasons.
SPM-289	E-SPM-173	A	1	29	1	30	WGI provides specific uncertainty language on the increase in frequency of hot days, hot nights, and heat waves not included here. Specifically, hot days and hot nights are very likely warmer and more frequent, and heat waves are likely more frequent. (Michael Mastrandrea, Stanford University)	Likelihood statements clarified for all statements.
SPM-290	E-SPM-175	A	1	29	1	30	Replace "...while hot days, hot nights, " by "...while warm days, warm nights," (Serhat Sensoy, Turkish State Meteorological Service)	Rejected; terminology is as used in WGI underlying chapter and SPM.
SPM-291	E-SPM-178	A	1	29	1	30	For the sake of consistency the likelihood of "heat waves increased in frequency" should be indicated. (Volodymyr Demkine, UNEP)	Likelihood statements clarified for all statements.
SPM-292	E-SPM-180	A	1	30	1	30	please insert 'have' before "increased" (Jon Egill Kristjansson, University of Oslo)	Accepted.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-293	E-SPM-182	A	1	30	1	30	Insert "have" after "heat waves" (i.e. ".....heat waves have increased in frequency" (Pat Finnegan, Grian)	Accepted.
SPM-294	E-SPM-186	A	1	30	1	30	...frequency, resulting in higher risk to heat disorders on human health. More intense... (Masatoshi Yoshino, Retired)	Rejected; topic 1 is about observed changes, not projections or implied risks.
SPM-295	E-SPM-181	A	1	30	1	31	More intense and longer droughts have not been observed in northern high latitude regions since 1970s. (Guoyu Ren, National Climate Center)	Used text from approved WGI SPM on droughts.
SPM-296	G-SPM-100	A	1	30	1	33	The statements on tropical cyclones does not accurately reflect the findings of WG I Table SPM.2. Replace with "and it is likely that intense tropical cyclone activity has increased in the North Atlantic since 1970". (Government of European Community)	Text replaced.
SPM-297	G-SPM-101	A	1	30	1	33	The SPM states: "More intense and longer droughts have been observed over wider areas since the 1970s, particularly in the tropics and subtropics, and there is evidence of an increase of intense tropical cyclone activity in the North Atlantic since about 1970. {1.1}" The language on hurricanes goes well beyond the evidence in the Synthesis Report and the WG1 report. It could just as easily say there is evidence for no change in hurricane intensity since 1970. This statement fails to recognize how the multi-decadal variability and the quality of data before 1970, mentioned in the WG1 SPM, complicate these conclusions. There has been new research into hurricanes, much of it contradictory. This statement should be changed to: "More intense and longer droughts have been observed over wider areas since the 1970s, particularly in the tropics and subtropics. While there is some evidence of an increase of intense tropical cyclone activity in the North Atlantic since about 1970, natural variability and data quality complicate the detection of long-term trends. {1.1}" (Government of United States)	Approved WGI SPM text used for tropical cyclones.
SPM-298	E-SPM-183	A	1	30			insert " "very likely" after waves, if this is what is meant. (Rolf Mueller, Research Centre Juelich)	Likelihood statements clarified for all statements.
SPM-299	E-SPM-184	A	1	30			hot nights, and heat waves increased in frequency. Please add: "hot nights, and heat waves have very likely increased in frequency" or use the same sentence as in chapter 1 page 4 line 14. (Christof Appenzeller, Federal Office of Meteorology and Climatology MeteoSwiss)	Likelihood statements clarified for all statements.
SPM-300	E-SPM-185	A	1	30			heat waves increased in frequency and intensity (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	WGI SPM finding refers to frequency only; the two are not independent.

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SPM-301	E-SPM-188	A	1	31	1	31	been observed over wider areas - I would remove 'over wider areas' as many droughts are more frequent but also over smaller areas; there is increased spatial heterogeneity but not necessarily over 'wider areas.' (David Barber, University of Manitoba)	Wording revised.
SPM-302	E-SPM-187	A	1	31	1	33	page 1 (line 31-33) "there is evidence of an increase of intense tropical cyclone activity in the North Atlantic since about 1970." versus page 4 (line 14-15) "There is no clear trend in the annual number of tropical cyclones. {1.4}" needs more clarification because seem to be contradictory; please explain and specify (Markus Erhard, European Environment Agency)	Approved WGI SPM text. Difference between intense activity and total numbers.
SPM-303	E-SPM-191	A	1	32	1	32	This paragraph starts with strong statements on confidence in observations, but ends with a sentence with no likelihood measure. Indeed what is meant by 'there is some evidence' in this context of likelihood measures? (Michael Manton, Monash University)	Wording consistent with approved WGI SPM text.
SPM-304	E-SPM-194	A	1	32	1	32	Here it is written that "there is evidence of an increase of intense tropical cyclone activity in the North Atlantic" but on page 4 line 14 it is said that "there is no clear trend in the annual number of tropical cyclones". It does not need to be a contradiction but it needs to be specified to avoid confusion. (Gesa Weyhenmeyer, Environmental Assessment)	Difference between intense activity and total numbers.
SPM-2129	G-SPM-2	D	1	32	1	32	On cyclones. The report refers sometimes to 'cyclone activity', and other times to 'number of cyclones' For the non-specialist, it is not clear whether there is a difference between those (say) concepts. A quick visit to the web gives the idea that 'number of cyclones' belongs in 'cyclone activity'. This should be clarified, because it would help interpreting the text. For instance, in line 32 it is stated that '...there is evidence of an increase of intense tropical cyclone activity...' But in lines 14-15 of page 4 it is stated that '[T]here is no clear trend in the annual number of tropical cyclones' If 'number of cyclones' were a part of 'cyclone activity' and it did not change, which component of 'cyclone activity' should make the latter change? (Government of Argentina)	Approved WGI SPM text. Difference between intense activity and total numbers.
SPM-305	E-SPM-189	A	1	32	1	33	This statement seems to be in contrast with p. 4, l. 14-15, where it is stated that there is no trend in the number of cyclones. At least if one translates "activity" into "more cyclones" -- clarify. (Rolf Mueller, Research Centre Juelich)	Activity is used deliberately since it does not state that all cyclones increased in numbers.
SPM-306	E-SPM-190	A	1	32	1	33	This statement on tropical cyclones does not adopt specific uncertainty language included in WG1, making it more ambiguous. WG1 states that increases in the intensity of tropical cyclones in some areas (including the North Atlantic) since 1970 are "likely". I suggest rewriting this sentence as follows: "it is likely that intense tropical cyclone activity in the North Atlantic has increased since 1970." (Michael Mastrandrea, Stanford University)	Wording is approved WGI SPM text.

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SPM-307	E-SPM-192	A	1	32	1	33	The comment about tropical cyclones should probably be removed because 1) it has recently been contested and 2) it is not reflective of what is written in other parts of the summary (Topic 1, pg 7, lines 9-10 and SPM pg 4, lns 14-15). (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Wording is approved WGI SPM text and based on assessment in WGI Chapter 3.
SPM-308	E-SPM-195	A	1	32	1	33	Add: "..... Activity in the North Atlantic since about 1970, WITH THE RISING OF HURRICANES INTENSITY" (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	This is implied in the current wording.
SPM-309	E-SPM-196	A	1	32	1	33	..there is evidence ofabout 1970. If you look at papers on the number of cyclones (F. Roux, Les cyclones atlantiques en 2004: chronique d'une année annoncée, 2005, La Météorologie, 8, 48, 23-27) or on the number of intense cyclones (See Goldenberg S. B., C. W. Landsea, A. M. Mestas-Nunez et W. M. Gray, 2001, The recent increase of Atlantic hurricane activity: causes and implications. Science, 293, 474-479), from 1950 to 2000 fluctuations appear: decrease from 1950 to the 70's and increase after up to a 2000 level similar to the 1950's one. So the increase since the 70's are not significant of a change. I propose to suppress the sentence. (Annick Douguédroit, Université de Provence)	Wording is approved WGI SPM text and based on assessment in WGI Chapter 3.
SPM-310	E-SPM-197	A	1	32	1	33	the remark '[...] there is evidence of an increase of intense tropical cyclone activity in the North Atlantic' seems to be in contradiction with the remark on page 4 line 14/15 that 'there is no clear trend in the annual number of tropical cyclones'. Probably what the authors mean is that the magnitude of cyclones is increasing while the frequency remains unchanged. This should be formulated in a better way. (Marcel Marchand, Delft Hydraulics)	Wording is approved WGI SPM text. Revised text should help.
SPM-311	G-SPM-102	A	1	32	1	33	Is "an increase in of intense tropical cyclone activity" accurate? SPM, P.4, lines 14-15 states, "there is no clear trend in the annual number of tropical cyclones", and however the aforementioned statement misleads the reader to think that the number of events has increased. Therefore, if the intended meaning is in fact that the intensity of tropical cyclones is increasing, the following is suggested: "...evidence of an increase in the intensity of tropical cyclone activity". (Government of Japan)	Wording is approved WGI SPM text. Revised text should help.
SPM-312	G-SPM-104	A	1	32	1	33	Add "in frequency" after "increase"; change "cyclone" to "cyclones"; and delete "activity." (Government of United States)	Rejected. Revised wording is approved WGI SPM text.
SPM-313	E-SPM-193	A	1	32			Is it clear to the general reader what is meant by tropical cyclone "activity"? This could be taken to mean frequency of occurrence and/or intensity. (Joanna Haigh, Imperial College)	Wording is approved WGI SPM text. Revised text should help.
SPM-314	G-SPM-103	A	1	32			After comparing the statement on cyclone intensity with the statement about number of cyclones on page 4, line 14-15, we propose a rewriting along the following lines from	Too detailed for space constraints; but revised text

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							topic 1.4 in order to give a more balanced text. Furthermore it should be made clear that tropical cyclones here include hurricanes and typhoons: "...and there is evidence for an increase of intense tropical cyclone activity (including hurricanes and typhoons) in the North Atlantic since about 1970, and suggestions of increased intense tropical cyclone activity in some other regions." (Government of Norway)	should help with clarity.
SPM-315	E-SPM-201	A	1	35	1	35	It really seems to be understating what we know to say this is only "very likely"--for the NH land areas, there is just not any comparable time-- and this should be said instead of saying it is only 90% likely (really--this is saying 90-99%, I presume, and is much closer to the higher percentage--so say things differently to indicate this. (Michael MacCracken, Climate Institute)	Rejected; meaning of uncertainty language has been clearly defined to avoid ambiguity and varied expressions. Consistent with WGI SPM.
SPM-316	E-SPM-198	A	1	35	1	36	To improve the logic on arguments please move sentence "It is very likely that the.....500 years." to line 15. (Caroline Leck, Department of Meteorology)	Rejected; palaeo-evidence is not on a par with the overwhelming amount of data from the instrumental record, so should not be mixed
SPM-317	E-SPM-199	A	1	35	1	36	This sentence would be better placed as the final sentence in paragraph 1 (same page). (Noel Gurwick, Carnegie Institution)	Rejected; palaeo-evidence is not on a par with the overwhelming amount of data from the instrumental record, so should not be mixed
SPM-318	E-SPM-200	A	1	35	1	36	Move add these lines to the paragraph ending line 15. (Hugo Beltrami, St. Francis Xavier University)	Rejected; palaeo-evidence is not on a par with the overwhelming amount of data from the instrumental record, so should not be mixed
SPM-319	E-SPM-203	A	1	35	1	36	delete this sentence (Suam Kim, Pukyong National University)	Rejected; no reason given.
SPM-320	G-SPM-105	A	1	35	1	36	We are going back to temperatures, which were treated on the top of the page. We propose to cut these 2 lines and paste them in line 13, same page. (Government of France)	Rejected; palaeo-evidence is not on a par with the overwhelming amount of data from the instrumental record, so should not be mixed
SPM-321	G-SPM-106	A	1	35	1	36	This sentence seems out of place here - rather isolated. Suggest bringing it up into the first paragraph. (Government of Canada)	Rejected; palaeo-evidence is not on a par with the overwhelming amount of data from the instrumental record, so should not

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								be mixed
SPM-322	G-SPM-107	A	1	35	1	36	Is this statement (last 50 years warmest for 500 years in Northern Hemisphere) really important for policy makers? What will they do differently because of it? The point has been made earlier on page 1 that there is widespread warming and climate change. (Government of New Zealand)	Rejected; different time scale important for broader perspective and provides additional evidence.
SPM-323	G-SPM-108	A	1	35	1	36	Integrate sentence in the paragraph on lines 11 to 14 since this paragraph already deals with global temperature. (Government of European Community)	Rejected; palaeo-evidence is not on a par with the overwhelming amount of data from the instrumental record, so should not be mixed
SPM-324	E-SPM-202	A	1	35			I suggest to add that it is likely that it was the warmest period in the last 1300 years (wording see WGI SPM) - given the discussion around this question, the information about the late 20th century being warmer than any other period in the last 1300 years seems at least as important to me as that about the little ice age having been cooler! (Gabriele Hegerl, Duke University)	Agreed. Text added.
SPM-325	G-SPM-110	A	1	36	1	36	Add " and likely the highest in at least the past 1300 years". (Government of Australia)	Agreed. Text added.
SPM-326	G-SPM-109	A	1	36			The text should also refer to the longer record i.e. likely over the last 1300 years (Topic 1 page 3 line 12) (Government of Ireland)	Agreed. Text added.
SPM-327	E-SPM-204	A	1	37	1	37	Footnote. "indicate" means that it is sheer guesswork from partisan "experts" (Vincent Gray, None)	Rejected; it is based on assessment as discussed in detail in full WGI report.
SPM-328	E-SPM-205	A	1				this section should also contain reference to the higher sea level and partial melting of the Greenland Ice Sheet at the time of the last interglacial. (John Church, CSIRO)	This is stated in later section 3.
SPM-329	E-SPM-206	A	1				Generally a good summary with no major issues except the cost issue mentioned above [TSU note: See Comment E-5-192-A]. (John Nyboer, Simon Fraser University)	Noted.
SPM-330	E-SPM-207	A	1				Although probably included in an appendix, I would strongly recommend that two information boxes be added to the introduction to define key terms for policymakers before these terms are used in the text. One box should include the definitions for the confidence terms (i.e., most likely, high confidence, etc.). The other box should define the scenarios that are listed in several tables (i.e., B1, A1T, etc.). The initial definition of these terms will facilitate reading and understanding the text.	Footnotes provided at appropriate places.

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							(Robert Molinari, University of Miami)	
SPM-331	E-SPM-208	A	1				a footnote the first time uncertainty is emphasized by using italics -- so "likely" and "very likely" on pg. 1 -- explaining, in short, the idea of uncertainty and referencing the Introduction item of supporting documents would be very helpful. (Herman Sievering, University of Colorado)	Footnote added.
SPM-332	G-SPM-111	A	1				I am very pleased with the proposed ordering: 1. observations; 2. causes of variations. This should be kept as it is. (Government of Netherlands)	Noted.
SPM-333	G-SPM-6	C	1				general comment: add evolution since TAR in one sentence (uncertainty ranges, more evidence, trend is confirms,etc) e.g use a "burning embers plot", to illustrate changes TAR-AR4 (Government of Belgium)	Not appropriate to provide a summary of a summary; burning embers figure rejected after consideration by entire author team.
SPM-334	E-SPM-209	A	2	1			and following: when a phrase such as "with high confidence" is used I would suggest it be set off with commas. (Herman Sievering, University of Colorado)	Rejected; believe that italics are equally effective and less disruptive to flow.
SPM-335	E-SPM-210	A	2	2	2	6	The inaccuracy levels of these graphs are much higher, as the figures are "averages of averages of averages" involving many "unknown unknowns" (Vincent Gray, None)	Rejected; random errors average out as per basic statistics.
SPM-336	E-SPM-211	A	2	4	2	5	Same comment for the same plot as in Fig 1.1 of Topic 1: the term "decadal averaged values" should probably not be used here - a decadal average is often construed as an average taken on set ten-year periods, eg 1951-1960, 1961-1970, etc. Probably clearer would be to call it a "ten-year running average". (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	WGI SPM approved figure and caption.
SPM-337	G-SPM-113	A	2	9	1	12	insert after "changes" in line 11 the sentence "in a selected set of data series" to be consistent with the text in SPM of WGII. (Government of Kingdom of Saudi Arabia)	Rejected; wording is agreed WGII SPM text.
SPM-338	E-SPM-215	A	2	9	2	9	Isn't the evidence for Australia and New Zealand non-significant? (Nathan Gillett, University of East Anglia)	Statement does not refer to statistical significance.
SPM-339	E-SPM-216	A	2	9	2	9	"Observational evidence from all continents and most oceans shows *(very likely) that.....". On the present text, "very likely" is omitted. My comment is how about to put a foot note on this page for explaining the process of discussion and the reason why the word "very likely" was taken out, Scientists and experts of this project believe that putting on "very likely" is reasonable and appropriate judging from holistic understanding of their studies and researches, which should be respected and must leave this word to show as one of a true and	Rejected; wording is agreed WGII SPM text.

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							scientific evidence even in a form of a foot note. (Susumu Nakamaru, Sun Management Institute)	
SPM-340	E-SPM-217	A	2	9	2	9	"all continents" would include Antarctica - same comment as foregoing (David Jackson, McMaster Institute for Energy Studies)	Correct; changes have been observed on Antarctic Peninsula.
SPM-341	G-SPM-7	C	2	9	2	9	'Observational evidence...shows that...' is confusing. I suggest starting the sentence as follows; 'Observational data from all continents and most oceans show that...'. (Government of Belgium)	Rejected; wording is agreed WGII SPM text.
SPM-342	G-SPM-112	A	2	9	2	11	The current sentence states that observations were made on all continents and most oceans. However, it does not make completely clear whether systems in all these regions have actually been affected by recent climate change. For clarity, the sentence should be reworded to "Observational evidence shows that many natural systems, on all continents and most oceans, are being affected...". (Government of European Community)	Rejected; wording is agreed WGII SPM text.
SPM-343	E-SPM-212	A	2	9	2	12	To improve the logic on arguments please move sentence in bold "Observational evidence from all continents.....(Figure SPM-2)." to line 26. (Caroline Leck, Department of Meteorology)	Comment not clear – there is no line 26.
SPM-344	E-SPM-213	A	2	9	2	12	This sentence seems to me to be technically incorrect, or at least misleading in that "regional climate change" is somehow differentiated from "global climate change." The global climate is changing and the changes are evident in many regions. It is also very unclear what is meant by "natural systems"--this makes the whole sentence seem to be about natural changes when this is not what is meant at all. I would suggest rewording to say "Observational evidence from all continents and most oceans indicates that climate change, particularly increasing temperature, is occurring throughout the world, and this is affecting ecosystems, glaciers, wildlife, coral, and other physical and biological systems." Specifically citing the types of systems is important, or it is unclear what is meant in the second sentence. (Michael MacCracken, Climate Institute)	Rejected; wording is agreed WGII SPM text. Studies of effects generally only stretch to local or regional scales.
SPM-345	E-SPM-214	A	2	9	2	12	The statement indicates that evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes. While it may be true that there is at least one observation for each continent there are some continents that are poorly represented, i.e. there are large regions that are not represented at all (the southern hemisphere for eg.) and most of the evidence is in Europe. This fact is not mentioned in the discussion of this statement and is only mentioned on page 4 with a brief statement. This statement regarding the distribution of observed changes should be made up front when Figure SPM-2 is introduced. (Sharon Smith, Geological Survey of Canada)	Agreed. Text moved.
SPM-346	E-SPM-222	A	2	11	2	11	89% is very precise for a measure of corroboration. I still believe there is a degree of question begging with this approach. When a scientist does a study to look for impacts of warming, it is	Accepted, 89% deleted from headline.

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							not surprising that they find it 90% of the time. Is it clear that all these studies were simply looking for change in any direction? (Michael Manton, Monash University)	
SPM-347	G-SPM-115	A	2	11	2	11	The use of an accurate figure such as 89% gives a false impression of accuracy. Replace "More than 89%" by "About 90 %". (Government of France)	Approved WGII SPM text. Text moved.
SPM-348	G-SPM-117	A	2	11	2	11	The meaning of a "warming world" is not totally clear and reads like jargon to which the reader has not been formally introduced. Consider more explanatory language, such as "...consistent with the evidence that the earth is warming..." (Government of Japan)	Accepted, text revised.
SPM-349	G-SPM-118	A	2	11	2	11	suggest writing "direction of change" instead of "change" (Government of Republic of Korea)	Agreed; text moved.
SPM-350	G-SPM-119	A	2	11	2	11	More than 89% sounds awkward. Is the number so exact? Better to say almost 90% or about 90%? (Government of Sweden)	Approved WGII SPM text. Text moved.
SPM-351	E-SPM-221	A	2	11	2	12	delete last sentence starting with More than.... (Hugo Beltrami, St. Francis Xavier University)	Text moved.
SPM-352	G-SPM-114	A	2	11	2	12	This sentences should phrase that the conclusion is based on large data basis. Therefore, please include a footnote from SPM WG II p. 2 "as following: "A subset of about 29,000 data series which where selected from about 80,000 data series from 577 studies. These met the following criteria: (1) Ending in 1990 or later; (2) spanning aperiod of at least 20 years; and (3) showing a significant change in either direction, as assessed in individual studies." (Government of Germany)	Taken into account; statement moved and combined with this text.
SPM-353	G-SPM-116	A	2	11	2	12	The sentence as it stands does not properly represent the result from the WGII report. The 89% applies to OBSERVATIONS SHOWING SIGNIFICANT CHANGE, so the sentence should read: "More than 89% of observations showing significant change have changes consistent with a warming world." (See footnote on page 3 of WGII SPM. The 89% is of >29,000 data series that were selected from all observational data on the basis of specific criteria that included that the data showed significant change in either direction.) (Government of Canada)	Taken into account; text moved and revised.
SPM-354	G-SPM-120	A	2	11	2	12	For the sentence "More than 89% ... with a warming world", "89%" is based on a subset of "29,000 observational data series from 75 studies" which is selected from about 80,000 data series from 577 studies (see WGII SPM Page 2). It is suggested to delete this	Text now unbolded. Text about 80,000 added to figure caption.

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							sentence from the bold paragraph and add the sentence in line 1 to line 3 (including the footnote) on page 6 of Topic 1 to line 4 on page 3 of the SPM. (Government of China)	
SPM-355	G-SPM-121	A	2	11	2	12	Delete the sentence that begins “More than 89%...”, and substitute the sentence from lines 1-3 of Topic 1 (p. 6), together with its footnote 2. The deleted sentence is an abbreviated portion of the sentence from Topic 1 with changes here that affect its meaning substantially. Note the corresponding language in page 2 of the WG2 SPM. (Government of United States)	Text from footnote added to figure caption with these details.
SPM-356	E-SPM-218	A	2	11			warming world = i prefer another term (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	Text revised.
SPM-357	E-SPM-219	A	2	11			Suggested wording: "About 90% of observed changes are consistent with the direction of change expected as a response to warming." (Volodymyr Demkine, UNEP)	89% is approved WGII finding; text moved and revised.
SPM-358	E-SPM-220	A	2	11			Please don't use numbers like 89% - no one believes we know this number to the second significant figure. (Tom Crowley, Duke University)	Approved WGII SPM text.
SPM-359	E-SPM-223	A	2	11			89% is correct? I think that it should be 94%. (Kenichi Matsuoka, University of Washington)	89% is correct. Approved WGII SPM text.
SPM-360	E-SPM-224	A	2	12	2	13	The word "average" appears twice... perhaps "global mean sea level". (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Comment not clear.
SPM-361	E-SPM-227	A	2	14	2	14	"high confidence" is a mere guess (Vincent Gray, None)	Rejected; see WGII chapter 1 for detailed assessment.
SPM-362	G-SPM-122	A	2	14	2	14	after high confidence: Refer to new footnote based on SYR Introduction p3, l8-12: “The assessed confidence of a statement is the result of expert judgement and is expressed as: very high confidence at least 9 out of 10 chance of being correct, high confidence about 8 out of 10, medium confidence about 5 out of 10, low confidence about 2 out of 10, very low confidence less than 1 out of 10.”. (Government of Netherlands)	Footnote added on first page to clarify all likelihood and confidence statements.
SPM-363	G-SPM-124	A	2	14	2	15	A bit vague phrase: “Changes in snow and frozen ground ... , increased ground instability ...”. A request to authors: please, check it once more. (Government of Russian Federation)	Noted and checked, consistent with wording in WGII SPM.
SPM-364	E-SPM-225	A	2	14	2	16	To improve the logic on arguments please move sentence "Changes in snow, ice and frozen ground.....Arctic and Antarctic flora and fauna." to line 34. (Caroline Leck, Department of Meteorology)	Comment not clear; there is no line 34 anywhere near.

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SPM-365	E-SPM-226	A	2	14	2	16	delete lines (Hugo Beltrami, St. Francis Xavier University)	Rejected; no reason provided.
SPM-366	G-SPM-123	A	2	14	3	21	Add the footnotes for the terminology of confidence "high", "medium"... (Government of Germany)	Footnote added on first page to clarify all likelihood and confidence statements.
SPM-367	G-SPM-125	A	2	15	2	15	Revise "increased ground instability in mountain" to "decreased ground stability in mountain." (Government of United States)	Rejected; approved SPM wording.
SPM-368	E-SPM-228	A	2	15	2	16	Again, can "reduction in tundra ponds" be mentioned here with permafrost instability? (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Too detailed for SPM.
SPM-369	E-SPM-230	A	2	16	2	16	The statement "and led to changes in Arctic and Antarctic flora and fauna" is misleading. In the given context this is even wrong, since such changes have been shown around the globe, including tropical and temperate zones and even if regarding the mean restricted context, then it would have to include all cold regions at high elevation as well (note, ca. 1 quarter of land areas are mountainous). I suggest: "and led to changes in Arctic, Antarctic, and mountainous flora and fauna" (e.g. most recent study corroborating this, Pauli, H., M. Gottfried, K. Reiter, C. Klettner & G. Grabherr, 2007. "Signals of range expansions and contractions of vascular plants in the high Alps: observations (1994-2004) at the GLORIA* master site Schrankogel, Tyrol, Austria." Global Change Biology, 13(1): 147-156. http://dx.doi.org/10.1111/j.1365-2486.2006.01282.x). (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected; list of examples is approved wording from WGII SPM. The list is not exclusive.
SPM-370	E-SPM-231	A	2	16	2	16	Is there any evidence for changes to Antarctic fauna? The SPM tends to erroneously lump together the Arctic and the Antarctic; evidence for climate change impacts are robust in the former and much less well known in the latter. (David Jackson, McMaster Institute for Energy Studies)	Yes. Significant changes on Antarctic Peninsula.
SPM-371	E-SPM-232	A	2	16	2	16	and led to changes in Arctic and Antarctic MARINE AND TERRESTRIAL flora and fauna (David Barber, University of Manitoba)	Unnecessary detail.
SPM-372	G-SPM-126	A	2	16	2	16	Before the word "Arctic" insert "some," consistent with line 16 of Topic 1 (p. 2). (Government of United States)	Accepted
SPM-373	E-SPM-229	A	2	16			what kind of changes? (Peter Haas, University of Massachusetts)	Too much detail for SPM.
SPM-374	E-SPM-233	A	2				In Fig. SPM-1, I believe the temperture unit at the right side should be "F", instead of "C". Otherwise it is too much warming. (Tieju Ma, International Institute for Applied Systems Analysis)	Rejected. C is correct scale.

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SPM-375	E-SPM-234	A	2				Figure SPM-1: The global average sea level displays the trend that starts from negative values, making it unclear if the observed sea level rise has positive consequences (providing it to return to its original state) or it is a result of natural fluctuations. Propose to provide more detailed explanation of the sea level trend observed. (Michael Gytarsky, Institute of Global Climate and Ecology)	Approved WGI SPM figure.
SPM-376	E-SPM-235	A	2				Figure SPM-1: the figure needs a simpler interpretation. (Peter Haas, University of Massachusetts)	Approved WGI SPM figure.
SPM-377	E-SPM-236	A	2				Figure SPM-1: Suggest drawing 'zero' line in each panel to aid the reader. Also change caption text to: 'All changes are relative to corresponding averages for the period 1961-1990 (left-hand axes). Absolute values of temperature and snow cover are shown on right-hand axes. (David Fahey, NOAA Earth Science Research Laboratory)	Approved WGI SPM figure.
SPM-378	E-SPM-237	A	2				Figure SPM-1: I would suggest that the end of summer sea ice extent in the northern hemisphere is a better variable to plot in the bottom panel of figure SPM-1. The sea ice integrates the ocean and atmosphere climate system better than snow cover does and thus I would suggest inserting sea ice minimum extent using both the passive microwave record and compilations preceding this dates from Walsh et al. (David Barber, University of Manitoba)	Approved WGI SPM figure.
SPM-379	E-SPM-238	A	2				Figure SPM-1 Comment: Amend Title to Fig SPM-1 to read: "Changes in [Insert: "Global average"] Temperature, [Insert: "Global average"] Sea Level and Northern Hemisphere Snow Cover. (So Title reads: "Changes in Global average Temperature, Global average Sea Level and Northern Hemisphere Snow Cover"). (Pat Finnegan, Grian)	Approved WGI SPM figure.
SPM-380	E-SPM-239	A	2				Figure SMP-1C the snow cover change only can indicate the snow melt earlier. It could not indicate the snow cover declined (Xiuqi Fang, Beijing Normal University)	Approved WGI SPM figure.
SPM-381	E-SPM-240	A	2				Are the 'uncertainty intervals' in figure spm-1 the 90% uncertainty intervals used in the text? (Michael Manton, Monash University)	Yes.
SPM-382	G-SPM-127	A	2				The figure needs a simpler interpretation. Please clarify figure caption. (Government of United States)	Approved WGI SPM figure caption.
SPM-383	G-SPM-128	A	2				Figure SPM-1. suggest inserting "surface" between average and temperature at "(a) Global average temperature" in first graph. (Government of Republic of Korea)	"surface" is in caption. Approved WGI SPM figure.
SPM-384	G-SPM-129	A	2				Figure SPM-1 comment: The label on the vertical axis ("Difference from 1961-1990") is not clear - particularly for a lay reader. We do not have a good solution but suggest that	Approved WGI SPM figure. Not clear why "difference" should be

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							"Change since 1961-1990" is at least a bit clearer. (Government of New Zealand)	unclear.
SPM-385	G-SPM-130	A	2				Figure SPM-1 comment: Please remove the temperature and area scales from the right hand vertical axes. Given that the title, caption, and vertical label of this figure all refer only to CHANGES in the parameters, it is not appropriate to include the absolute values as well. For the lay reader, is confusing. (Government of New Zealand)	Rejected. Changes can also occur on absolute scales.
SPM-386	G-SPM-131	A	2				Fig SPM-1. We propose that the text does not refer to colors in the figure. This is in order to facilitate the reading for those printing without colors. (Government of Norway)	The basic message of the figure can be understood also in black and white.
SPM-387	G-SPM-8	B	2				Fig SPM1 y-axis need to be consistent on each side of chart; in top section should be "global average surface temperature"; in caption b) should be "global average sea level from tide gauge" (it is not showing the rise) (Government of United Kingdom)	Approved WGI SPM figure. This is stated in the caption.
SPM-2130	E-SPM-3	D	2				Figure SPM-1. The text in Figure SPM-1 (a) should read Global average air temperature. (Stephen Hawkins, Marine Biological Association of the UK)	Approved WGI SPM figure. Caption states that it is surface temperature.
SPM-388	E-SPM-242	A	3	1	3	1	there is "high confidence" - is this the same as saying "it is very likely that hydrological systems have also been affected...."?? Is this use of terms explained in the document - it needs to be for policy makers. (Peter Berry, Health Canada)	Footnote added to page 1 to explain confidence terminology.
SPM-389	E-SPM-243	A	3	1	3	3	The uncertainties in ground water changes could be noted, when hydrology is explicitly mentioned. (Michael Manton, Monash University)	Too detailed; selection of effects is drawn from WGII SPM.
SPM-390	E-SPM-244	A	3	1	3	3	It needs to be mentioned that this melting is reducing the glacial mass that provides the flow for many rivers and so is endangering the long-term sustainability of water resources for many people. (Michael MacCracken, Climate Institute)	This is about observed changes, not about projected consequences.
SPM-391	G-SPM-132	A	3	1	3	3	The statement that "There is high confidence that hydrologic systems have also been affected around the world through enhanced run-off ..." is too broad. The qualification "some" should be inserted before "hydrologic systems". Conform text to that found on p. 2 of the WG2 SPM. (Government of United States)	Agreed. Text changed.
SPM-392	E-SPM-241	A	3	1	3	4	There should be a mention of the impact on the hydrological systems (rivers and inland lakes) in the tropics as well even though lack of observations and model uncertainty may prohibit	Too detailed for SPM.

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							putting a level of confidence. (Richard Anyah, Rutgers University)	
SPM-393	E-SPM-245	A	3	2	3	2	enhanced AVERAGE ?? run-off (Germán Poveda, Universidad Nacional de Colombia)	Unnecessary; wording is from approved WGII SPM.
SPM-394	G-SPM-8	C	3	2	3	2	add a dash after glacier, i.e.: '... discharge in many glacier- and snow-fed rivers...'. (Government of Belgium)	accepted.
SPM-395	E-SPM-246	A	3	2	3	3	Add: "...in many glacier and snow-fed rivers, changing thermal structure and water quality of warming rivers and lakes, AND CHANGES IN PRECIPITATION PATTERNS"{1.2} (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	This has already been stated on page 1. These statements are about effects of climate changes.
SPM-396	E-SPM-247	A	3	3	3	3	Change to "rivers, as well as..." Otherwise this is too easy to read as a run-on sentence. (Michael Mastrandrea, Stanford University)	Rejected; "and" is grammatically ok.
SPM-397	G-SPM-133	A	3	3	3	3	The authors should explain why a changing thermal structure in rivers and lakes is important. (Government of Australia)	Too much detail for SPM.
SPM-398	G-SPM-134	A	3	3	3	3	suggest deleting "changing thermal structure and water quality of" (Government of Republic of Korea)	Rejected; important finding highlighted in WGII SPM.
SPM-399	G-SPM-135	A	3	3			Add: "...in many glacier and snow-fed rivers, changing thermal structure and water quality of warming rivers and lakes, AND CHANGES IN RAINFALL PATTERNS"{1.2} (Government of Cuba)	This has already been stated on page 1. These statements are about effects of climate changes.
SPM-400	E-SPM-248	A	3	4	3	5	I'm not sure "decadal averaged values" should be used here - a decadal average is often construed as an average taken on set ten-year periods, eg 1951-1960, 1961-1970, etc. Probably clearer would be to call it a "ten-year running average". (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Presume this refers to previous page (caption Figure SPM-1). Rejected; approved WGI SPM figure caption.
SPM-401	E-SPM-250	A	3	5	3	5	It is written "in terrestrial ecosystems" but the same applies for aquatic ecosystems so that I suggest to add aquatic ecosystems in the sentence (Gesa Weyhenmeyer, Environmental Assessment)	Rejected; different confidence level.
SPM-402	E-SPM-256	A	3	5	3	5	..poleward shifts are only located in extra-tropical areas, not in the tropical one. Could that be noticed? (Annick Douguédroit, Université de Provence)	Not differentiated in WGII chapter 1. Too detailed.
SPM-403	E-SPM-253	A	3	5	3	6	Change "In terrestrial ecosystems, earlier timing..." to ""In terrestrial ecosystems, observations of earlier timing..." (Knute Nadelhoffer, University of Michigan)	Title of this section makes it clear that this is about observations; unnecessary.

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SPM-404	G-SPM-136	A	3	5	3	6	Suggest changing "upward" to towards higher altitudes" to make it more clear for the reader what is meant here. (Government of Canada)	Upward seems to be clear. WGII SPM wording.
SPM-405	E-SPM-249	A	3	5	3	8	There should be reference to coastal ecosystems, as well as freshwater and marine ecosystems. (Magdalena Muir, Environmental and Legal Services Ltd.)	Coastal ecosystems are necessary included in a combination of terrestrial and marine ecosystems.
SPM-406	E-SPM-251	A	3	5	3	8	I suggest making the two sentences parallel, making both either "temp/change" or "change/temp". Currently the order flips between sentences. (Michael Mastrandrea, Stanford University)	Taken into account in revision
SPM-407	E-SPM-252	A	3	5	3	8	delete lines (Hugo Beltrami, St. Francis Xavier University)	
SPM-408	E-SPM-255	A	3	5	3	8	A recent report by UNEP states that the major drivers of change, degradation, or loss of marine and coastal ecosystems and services are mainly anthropogenic. In its discussion, one can sense that presently, from its order of presentation, land use change and habitat loss, overfishing and invasive species are more important than climate change. However, the report does state that climate change is increasingly becoming one of the dominant drivers of change. Thus, it is difficult to attribute the recent changes in marine biological systems to the recent rise of water temperatures. In other words, they may be correlated but not causative. Therefore, I suggest to replace "associated" by "correlated statistically". Reference: UNEP (2006) Marine and coastal ecosystems and human wellbeing: A synthesis report based on the findings of the Millennium Ecosystem Assessment. UNEP. 76pp (Jilan Su, Second Institute of Oceanography, State Oceanic Administration)	No. Clear evidence in assessed studies of climate effects, despite multiple factors.
SPM-409	E-SPM-254	A	3	5			at what elevations? What species? Consequences? (Peter Haas, University of Massachusetts)	Too mch detail.
SPM-410	E-SPM-257	A	3	6	3	8	The issue of ocean acidification needs to be mentioned--already seeing a response in the compensation level in the ocean. (Michael MacCracken, Climate Institute)	Reject; no clearly documented effect on biological systems yet.
SPM-411	E-SPM-258	A	3	6	3	8	In marine and freshwater systems, rising water temperatures are with high confidence associated with shifts in ranges and changes in algal, plankton and fish abundance. {1.2} include AND CORAL REEFS BLEACHING EPISODES (Avelino G. Suarez Rodriguez, Ecology and Systematic)	Coral reef changes are due to multiple stresses, so not included in SPM; have been added to Topic 1.
SPM-412	G-SPM-137	A	3	7	3	7	The authors should consider whether "associated" is the right word to use at this point as it may imply that rising water temperatures have somehow been caused by range changes in algal, plankton and fish abundance. Suggest "associated with" is replaced with "evidenced by".	Associated is word used in WGII SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of Australia)	
SPM-413	E-SPM-259	A	3	7	3	8	Invert statement to state that shifts in ranges and abundance of algae, plankton and fish are associated with rising water temperatures (cause and effect is made more clear). (Donald Lemmen, Natural Resources Canada)	Wording revised
SPM-414	E-SPM-260	A	3	7	3	8	inverse reasoning as it does not make sense. Sentence should read: Shifts in ranges and changes in algal, plankton and fish abundance in marine and freshwater systems are associated with rising water temperatures with high confidence. (This implies that the cause for these changes are rising water temperatures, and not the inverse!) (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Wording revised
SPM-415	E-SPM-261	A	3	8	3	8	these changes are climatologically consistent, both in space and time. (Germán Poveda, Universidad Nacional de Colombia)	Noted; no change requested?
SPM-416	E-SPM-263	A	3	8	3	8	Insert "distribution" (So reads: ".....changes in algal, plankton and fish distribution and abundance ") (Pat Finnegan, Grian)	This is implied in abundance.
SPM-417	E-SPM-265	A	3	8	3	8	Add: ".....algal, plankton and fish abundance, AND CORAL REEFS BLEACHING AROUND THE WORLD (FLORIDA, CARIBBEAN, AUSTRALIA, ASIA){1.2} (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Coral reef changes are due to multiple stresses, so not included in SPM; have been added to Topic 1.
SPM-418	G-SPM-9	C	3	8	3	8	the word abundance can be interpreted by lay man in different ways: do you mean 'prevalence', 'productivity', 'concentration' or something else ? (Government of Belgium)	Abundance should be clear; it means prevalence (though this would be an unusual term).
SPM-419	G-SPM-10	C	3	8	3	8	changes in algal, plankton and fish abundances.' (Government of Belgium)	Singular seems to be also correct; as approved for WGII SPM.
SPM-2131	E-SPM-4	D	3	8	3	8	Add benthos to the list of main species. This could be subdivided into "intertidal" for which there is most recent evidence of climate-induced change (e.g. Sagarin et al. 1999, Zacherl et al. 2003, Mieszkowska et al, 2006, Lima et al. 2006, Mieszkowska et al. 2007). (Stephen Hawkins, Marine Biological Association of the UK)	Too much detail for SPM.
SPM-420	E-SPM-264	A	3	8	4	8	Effects of climate change on coastal areas have been noticed: abandonment of a small flat Pacific island. It is not due to population increase as it is mentioned in 18. (Annick Douguédroit, Université de Provence)	Not in underlying chapter. Link with temperature change not clearly established.
SPM-421	E-SPM-262	A	3	8			shifts - what kind, up or down? Which are larger? (Peter Haas, University of Massachusetts)	Too much detail for SPM.
SPM-422	G-SPM-138	A	3	8			Add: ".....algal, plankton and fish abundance, AND CORAL REEFS BLEACHING	Coral reef changes are due to multiple stresses, so not included.

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							AROUND THE WORLD (FLORIDA, CARIBBEAN, AUSTRALIA, ASIA){1.2} (Government of Cuba)	
SPM-423	G-SPM-140	A	3	9	3	9	Add a headline above the graph: Changes in physical and biological systems and surface temperature 1970-2004. (Government of Germany)	Accepted.
SPM-424	E-SPM-266	A	3	9	3	10	It really makes no sense in Figure SPM-2 to just combine the terrestrial and marine biological numbers to get a single global number--the imbalance is just too much to justify this--showing the two sets of information separately is fine, but given the oceans cover two-thirds of the Earth, just adding things up makes no sense. (Michael MacCracken, Climate Institute)	The differences are clearly visible from the Figure itself.
SPM-425	G-SPM-139	A	3	9	3	10	As this figure contains graphical information of great importance to the reader, it should be enlarged to fill the page so that the symbols can be easily differentiated. (Government of Colombia)	Figure revised so that it can be enlarged more easily.
SPM-426	G-SPM-11	C	3	9	3	10	In ** at bottom of Figure, insert space after 'sites'. (Government of Belgium)	Accepted.
SPM-427	G-SPM-141	A	3	11	3	18	To be consistent with WGII SPM, it is suggested to use the figure explanation in WGII for Figure SPM-2. (Government of China)	Agree. Fuller figure caption now included.
SPM-428	E-SPM-267	A	3	11			"Locations of significant changes in observations of" could be changed to "Locations where observations show significant changes in" to make it clear that it is what is observed to have changed that is shown, rather than how the observing system has changed. More generally, the figure [TSU comment: Figure SPM-2] is not especially clear, with overlapping circles in some regions and multiple boxes with small text. Something simpler, more akin to Fig SPM-1 in complexity, might be more appropriate for the opening of a summary for policymakers. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Approved WGII SPM figure caption. Figure simplified, with boxes removed and TER and MFW information put in separate table.
SPM-429	E-SPM-268	A	3	12	3	13	This might be grammatical, but I would definitely switch the clauses at the beginning of this sentence. I think it would read more clearly as "Paleoclimate evidence indicates that in earlier times global average sea level..." (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Comment does not refer to SPM.
SPM-430	E-SPM-269	A	3	13	3	13	Figure SPM-2 Comment: Insert "average" before "surface temperature "changes" (So reads: "...are shown together with average surface temperature "changes over the period...") (Pat Finnegan, Grian)	Rejected, as it could be misinterpreted to mean global average. Approved WGII SPM wording for caption here.
SPM-431	G-SPM-12	C	3	13	3	14	remove 'biological systems' from parenthesis (Government of Belgium)	Rejected; approved WGII SPM figure caption.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-432	E-SPM-270	A	3	14	3	14	Insert "with any degree of confidence" at end of sentence. (So reads: "...to estimate a temperature trend with any degree of confidence.") (Pat Finnegan, Grian)	Rejected; approved WGII SPM figure caption. Point is not any degree of confidence.
SPM-433	E-SPM-271	A	3	16	3	16	Figure SPM-2: Although it is on the figure, I overlooked the boxes legend with the physical/biological split at first, suggest adding it into the caption: "... (bottom row) for *physical (left) and biological (right) systems* for..." (add text in **) (Mark Lawrence, Max Planck Institute for Chemistry)	Figure simplified.
SPM-434	E-SPM-272	A	3	18	3	18	Here and elsewhere in the SPM: "see longer report" - in each case it should be specified what is referred to, either the appropriate WG reports, or the full synthesis report (either could be understood from this) (Mark Lawrence, Max Planck Institute for Chemistry)	This will be clarified in the preface to the report.
SPM-435	G-SPM-142	A	3	18	3	18	The text should specify what is meant by "longer report" (Government of Norway)	This will be clarified in the preface to the report.
SPM-436	E-SPM-273	A	3	18	4	18	Due to previous remark, suppress "coastal population increases" (Annick Douguédroit, Université de Provence)	Comment not clear, but text on page 4 deleted for space reasons.
SPM-437	E-SPM-274	A	3	21	3	21	There is "medium confidence that other effects of regional climate on natural....." I see that this includes health impacts. What does medium confidence mean? Does it mean that there are conflicting studies (some show health impacts while some don't) or there are simply too few studies showing health impacts to say "high confidence"? This matters to decision makers. (Peter Berry, Health Canada)	See definition of confidence terminology (clarified through footnote).
SPM-438	E-SPM-277	A	3	21	3	21	I would argue that we have high (or very high) confidence in the arctic/alpine and boreal effects listed (F. Stuart Chapin, III, University of Alaska Fairbanks)	High confidence effects noted earlier in text.
SPM-439	G-SPM-145	A	3	21	3	22	The following list exclusively refers to changes in human systems. The sentence should be changed to "...that other effects of regional climate change on human systems are emerging...". (Government of European Community)	Rejected; "natural" is retained because managed forests are not human systems.
SPM-440	E-SPM-275	A	3	21	4	7	The placement of this list -- which concerns diverse consequences of climate change -- is very confusing because on page 6, line 12 there is a major transition to the idea that "human influences also extend to other aspects of climate." This kind of re-introduction of a topic strongly interferes with readability of the document. I suggest these two sections be pulled together and integrated. (Noel Gurwick, Carnegie Institution)	Comment not clear; current section deals with effects of climate change on humans, next section deals with effects of humans on climate change.

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SPM-441	E-SPM-276	A	3	21	4	7	The impacts cited in this list are much higher than "medium confidence"--the Arctic changes are happening (this only says "some human activities"), the seasonal length is changing, etc. (Michael MacCracken, Climate Institute)	High confidence effects noted earlier in text; changes related to human activities are less certain.
SPM-442	E-SPM-278	A	3	21	4	7	I would argue that there is high confidence that Inuit are affected by declines in sea ice and I would also add that ice roads are deteriorating both in the Arctic and Subarctic. (David Barber, University of Manitoba)	Confidence statement applies to sum of all three bullet points, where it is appropriate.
SPM-443	G-SPM-143	A	3	21	4	7	This paragraph is poorly worded compared to the corresponding text in the WG2 SPM (p. 3). Revert to verbatim text from the WG II SPM, beginning on page 3. For example, it is unclear if the fires and pests are directly attributed to climate change or rather that the ability of the forests to respond to / recover is impacted by climate change. Writing needs to be tighter. (Government of United States)	Text altered to reflect WGII SPM text ("in disturbance regimes").
SPM-444	G-SPM-144	A	3	21	4	7	This is a strong section and its inclusion in the final draft is suggested. (Government of Japan)	Noted and retained.
SPM-445	E-SPM-279	A	3	21			Figure SPM-2: What does it mean when a dot for analysis is sitting in a neutral/cooling area (eg SE US and high Southern Lats)? Admittedly, only very few areas on the globe have cooled, but the question should be addressed at least in the caption if all changes reported on have been observed in regions with warming. (Gabriele Hegerl, Duke University)	Scale differences due to local-scale studies and 5x5 temperature data set.
SPM-446	G-SPM-146	A	3	22	3	22	Consider adding in here the phrase from the WGII SPM that would add a caveat about the difficulty in detecting cc impacts because of non-climatic impacts as well. "...are emerging, ALTHOUGH MANY ARE DIFFICULT TO DISCERN DUE TO ADAPTATION AND NON-CLIMATIC DRIVERS OF CHANGE." (Government of Canada)	Accepted.
SPM-447	E-SPM-280	A	3	33	4	33	Add 2 before Causes.. (Annick Douguédroit, Université de Provence)	Refers to page 4. Accepted.
SPM-448	E-SPM-281	A	3				Summarize data reported in NATURE's special issue on climate change ("Data keep flooding in", NATURE, Vol 445, 8 February 2007, p. 581) including a higher number of large intensity hurricanes on the Atlantic (Hoyos et al, Science, 312, 94–97; 2006). (Germán Poveda, Universidad Nacional de Colombia)	SYR does not assess new literature.
SPM-449	E-SPM-282	A	3				Figure SPM-2: very hard to make sense of figure spm-2 Hire a science writer to explain (Peter Haas, University of Massachusetts)	Figure simplified.
SPM-450	E-SPM-283	A	3				Figure SPM-2: upper right cell doesn't have a % or # (Peter Haas, University of Massachusetts)	Figure simplified, cells deleted.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-451	E-SPM-284	A	3				Figure SPM-2: This figure does not seem in line with the repeated mentions (e.g., two pages earlier on p.1, lines 16 and 18-19) that the high northern latitudes have experienced the greatest warming. The statement on p.1 refers to the past 100 years, while the figure on p.3 only covers the period 1970-2004, so that there is not per se an inconsistency between the two. However, the low values depicted in the high latitudes of North America and Eurasia seem out of line with enough other statements, in the IPCC and elsewhere, that it would seem some clarification should be given. If the figure is correct, then the clarification could simply be to add the following sentence: "Note that over this period, 1970-2004, in contrast to some other periods, the high northern latitudes do not stand out as having the largest temperature increases." (Claire Parkinson, NASA Goddard Space Flight Center)	Text is correct. Warming is less at low latitudes. Map projection and temperature binning contributes to apparent effect.
SPM-452	E-SPM-285	A	3				Figure SPM-2: I recommend that in the 2X2 boxes for EUR, TER and GLO all the numbers are put into the box. It does not matter if the boxes become rectangles instead of squares, but I do not like that arrows are used, because one associates to arrows a meaning that in this case they do not have. I believe this change would greatly improve the readability of the figure (which is quite complex!). (Marco Mazzotti, ETH Zurich)	Boxes removed from figure and inserted into table, without arrows.
SPM-453	E-SPM-286	A	3				Figure SPM-2: I am concerned that figure SPM-2 does not adequately reflect observed changes in the polar regions (in particular the arctic). There has been considerable effort to describe changes in this part of the planet and in fact changes are happening first and most dramatically in the Arctic. The map should reflect this with both observed temperature change and effects on marine and terrestrial systems. I would suggest Comiso, 2002 for the temperature trends in this region and several sources for changes in the marine system. (David Barber, University of Manitoba)	Map does not include satellite data of effects eg sea ice in arctic; it is based on site data. 1970-2004 different to period shown in WGI assessment.
SPM-454	E-SPM-287	A	3				Figure SPM-2. This figure is not needed and is far too complicated for the SPM. It is not needed as it is only referred to once (P2 line 12) and it is not discussed or interpreted in the text - and neither should it be in the SPM. If you want to describe the comprehensiveness of climate studies then state: 'Scientists have studied the physical basis and the biological consequences of climate in all continents. They have concluded that observed physical and biological changes are consistent with expectations from a warming global climate in more than 90% of cases.' - and then refer to the WG section from which SPM-2 came. (John R. Porter, University of Copenhagen)	Rejected. Shows locations of time-series and illustrates geographical imbalance. Important to avoid charge of cherry-picking.
SPM-455	E-SPM-288	A	3				Figure SPM-2. The caption indicates that the map shows locations where significant changes have occurred. What is not clear is whether areas in which no dots are found are areas where there are no studies or where there are studies but they do not indicate significant changes (i.e. is there less change occurring in the southern hemisphere?). If it is the case that there are simply fewer studies in many regions, (in particular the southern hemisphere) then there a clear statement in the caption is required so that readers will not make interpretations on the regional distribution of observed changes in natural systems.	Clarified in revised caption.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Sharon Smith, Geological Survey of Canada)	
SPM-456	E-SPM-289	A	3				Figure SPM-2. I think it is misleading to lump the Arctic and Antarctic together when the changes, both observed and predicted, in each are so dramatically different, and also when probably almost all the observations reported are for the Arctic. (George Walker, Aon Re Asia Pacific)	Regional statistics deleted for simplicity.
SPM-457	E-SPM-290	A	3				Figure SPM-2, next to last line in box: "...at sites and large areas..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Accepted.
SPM-458	E-SPM-291	A	3				Figure SPM-2 should be simplified from that in the WGII SPM. Suggest removing data boxes and footnotes, move temperature scale and legend onto the map surface to produce clean, useable figure. Simplify caption accordingly while noting that figure depicts locations of more than 29,000 observational data sets showing significant change, 89% of which are consistent with warming (Donald Lemmen, Natural Resources Canada)	Agreed. Information in boxes separated from figure.
SPM-459	E-SPM-292	A	3				Figure SPM-2 legend - are readers going to understand what the 2x2 boxes refer to in the figure? (Andy Morse, University of Liverpool)	Boxes deleted from Figure.
SPM-460	E-SPM-293	A	3				Figure SPM-2 is interesting, but the fact that it is only based on a 35-year period is a major limitation, because on such short time scales natural fluctuations can regionally be indistinguishable from a global warming signal. For example, the European Arctic had a strong positive temperature anomaly in the 1930s and early 1940s, which has only been surpassed over the last 2-3 years, even though globally averaged temperatures are 0.5 K higher now than at that time. I understand that some of the data sets used to construct the figure do not exist for longer periods, but at the very least this limitation must be mentioned. (Jon Egill Kristjansson, University of Oslo)	The time period is mentioned, including in the added Figure title.
SPM-461	E-SPM-294	A	3				Figure SPM-2 - This figure is very complicated and requires too much explanation and probably not necessary for the SPM. The main message can be presented in the text that indicates that there have been many more studies since the TAR and that there is stronger evidence of observed changes in natural systems that is consistent with warming. (Sharon Smith, Geological Survey of Canada)	Figure has been simplified.
SPM-462	E-SPM-295	A	3				Fig SPM-2: numbers in 2x2 boxes are too small (Michel Rixen, NATO Undersea Research Center)	Boxes deleted from figure.
SPM-463	E-SPM-296	A	3				delete Figure SPM-2 (Hugo Beltrami, St. Francis Xavier University)	Rejected. Shows locations of time-series and illustrates geographical imbalance. Important to avoid charge of

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
								cherry-picking.
SPM-464	G-SPM-147	A	3				<p>Reproduce Figure SPM-2 exactly as it appears in the WG2 SPM with particular attention to color schemes and treatment of the symbols indicating observations. Include the title for this figure from the WG2 SPM and use the figure caption verbatim. Even with revisions incorporated into the final WG2 SPM version of this figure, it remains confusing and difficult to understand. Consider listing the information contained in the 2x2 boxes in a traditional table with the names of regions in full; the 2x2 boxes are confusing and difficult to read. Full names of regions in a traditional table will alleviate the need to define abbreviations in the caption.</p> <p>(Government of United States)</p>	Correct version now included. Boxes in table.
SPM-465	G-SPM-148	A	3				<p>Figure SPM-2: The note for this figure should include the caveats on the studies used to create the Figure, or at least refer readers to SYR Figure 1.2.</p> <p>(Government of Australia)</p>	Caption extended to include details on underlying data set.
SPM-466	G-SPM-149	A	3				<p>Figure SPM-2 is still rather hard to understand and did not benefit from any discussion at the WGII Plenary about how to improve the visual presentation of this Figure (such a discussion was deferred until the scientific content of this Figure was agreed upon, at which point there was no time left for discussion of presentation aspects of the material). Therefore, we resubmit many of our original recommendations for improving the presentation aspects of this Figure.</p> <p>1) Delete the box explaining the different size dots for Europe. Instead, include in the Figure caption lines 30-31 from page 58 of the Technical Summary which reads “dots represent about 75 studies which have >29,000 data series, of which about 27,800 are from European phenological studies.” If this were done, then all the dots could be made one size and the box about the dots removed from the graphic itself. As it is, it is impossible for the reader to ascertain which of the dots on the map correspond to which size. The main message is that most of the studies come from Europe and this message is provided with the suggested text change for the caption. 2) Clarify what the blank spaces on the map are - are they regions where no studies have been done, or regions where studies have been done and changes observed, but these were not significant? (Comments continue below).</p> <p>3) The gradations for the change in temperature between 1970 and 2004 are inconsistent. This requires explanation. Alternatively, qualitative descriptors of temp change could be used (i.e. warming/significant warming or temp decrease/increase)</p> <p>4) provide an improved map which shows the polar regions better - it is unclear in the present map whether observations in the Canadian high arctic are marine or terrestrial,</p> <p>5) choose colours for the dots that differ significantly from the colours used to depict</p>	<ol style="list-style-type: none"> 1. Varying dots provides clear information about geographical imbalance in data sets. 2. Added “Regions without dots have no time-series that meet these criteria...” to caption. 3. Gradations uneven to allow focus statistically significant/nonsignificant trends. 4. Approved figure and projection. 5. Dots are offset by white circles to make them clearly distinguishable

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							areas where observed temperature has decreased. (Government of Canada)	
SPM-467	G-SPM-150	A	3				Figure SPM-2 comment: This figure should be omitted from the SPM. It does not convey sufficient new and important policy-relevant information to be included. The relevant information is already clearly set out in the chapeau text on page 2 lines 9-12: "Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases. More than 89% of observed changes are consistent with a warming world". The figure adds only the geographical information, which probably shows where research groups are working, rather than where changes are and are not occurring. (The differentiation between physical and biological observations is hard to see and not likely to be picked up by readers of the SPM.) The figure does not show where or how many studies have been done that do NOT show significant changes. (Government of New Zealand)	Rejected. Shows locations of time-series and illustrates geographical imbalance. Important to avoid charge of cherry-picking.
SPM-468	G-SPM-151	A	3				Figure SPM-2 comment: Interpretation of the sub-box labelled "Europe*** " is not straightforward. Does that scale of circle sizes apply only to Europe (and if so, why - does a different scale apply elsewhere)? If not, then omitting the label 'Europe*** ' would also allow to omit the explanation at the bottom of the figure. The circles on the map of Europe are difficult to distinguish - but there do not appear to be any of the '1201-7500' size on the map, although we believe there should be. (Government of New Zealand)	Figure simplified.
SPM-469	G-SPM-152	A	3				Figure SPM-2 (and the corresponding Figure 1.2 in Topic 1) shows the association of observed changes in physical systems and biological systems with the increase in temperature by region. The locations of observed physical/biological change are, of course, distributed unevenly throughout the globe. The problem is that the figure does not show locations where observations indicate no significant change in the systems. In other words, there is no control group of locations. Do we interpret from the figure that observations of systems, for example, in the Amazon River basin showed no significant change? Or, should we assume that we really don't know if the systems there changed significantly because no documented observations exist? The statement on p. 4 lines 22-23 suggests the latter, but this should be made clear in the caption. The Figure 1.2 caption contains more information. (Government of United States)	Text added to figure caption. 'Regions without dots have no time-series that meet the criteria; in these regions physical and biological systems may or may not be changing but are not documented.'
SPM-470	G-SPM-153	A	3				Fig SPM-2. The number of observations in biological systems in the continental regions (28609), are 62 fewer than the number of observations in biological systems in the global scale (28671) (Government of Norway)	Specific numbers deleted.

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SPM-471	G-SPM-154	A	3				Fig SPM-2. The figure is blurred when printing in black/white. Particulary the dots identifying the observations (physical or biological system). (Government of Norway)	Figure quality improved.
SPM-472	E-SPM-297	A	4	1	4	7	Three items must be listed in the order of importance. List "human helath" first, and "agricultural and forestry" next. Make another item for moutain sports so that "Human activities in the Arctic" will be addressed more clearly. It is totally much more importnat than mountain sports. (Kenichi Matsuoka, University of Washington)	Revised listing follows order in WGII SPM
SPM-473	E-SPM-298	A	4	1	4	7	are there also examples for droughts and agriculture / forestry / water management or other sectors? Would be more explanatory if added to examples already listed (Markus Erhard, European Environment Agency)	Comment n ot clear.
SPM-474	G-SPM-155	A	4	1	4	7	In the first bullet effects are missing. Please make it consistent with the following bullets. (Government of Sweden)	Eeffects are stated in brackets; insufficient space for more detailed explanation.
SPM-475	E-SPM-299	A	4	2			replace "mountain sports" in "mountain activities" (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	Rejected; approved WGII SPM wording.
SPM-476	G-SPM-156	A	4	3	4	3	suggest writing "northern Hemisphere higher latitudes" instead of "northern higher latitudes" (Government of Republic of Korea)	Believe wording is clear without addition of "hemisphere"
SPM-477	E-SPM-300	A	4	3	4	7	"...at northern latitudes,..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	"higher" is important qualifier.
SPM-478	E-SPM-302	A	4	4	4	4	Switch "continental" and "regional" to arrive at a more logical progression of spatial scale. (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Comment does not seem to apply
SPM-479	G-SPM-157	A	4	4	4	4	earlier spring planting of crops : by a few days, a few weeks ? (Government of France)	Too much detail for SPM.
SPM-480	E-SPM-301	A	4	4	4	7	There should be a reference to increased risks to human health from contaminants as a result of climate change. For examples, pathways by which contaminants enter the ecosystems and the food web may shift. Higher temperatures can also result in increased rates in the uptake of contaminants into fish and shellfish, thus affecting ecosystem and human health. This relationship between contaminants and climate change may be especially true for enclosed warming seas such as the Mediterranean that already have natural concentrations of heavy metals, have unremediated deposits of contaminants from prior or onging human activity, and receive airbourne transboundary contaminants from other regions. Invasive coastal and marine species also need to be considered for their impact on human health, as well as ecosystem health.	Rejected; not directly linked to observed climate change; insufficient basis in underlying chapter.

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							(Magdalena Muir, Environmental and Legal Services Ltd.)	
SPM-481	E-SPM-304	A	4	6	4	6	heat-related mortality, This should be "heat and cold-related mortality", More temp rise is in the winters and people are more likely to die of cold than heat, even if it is not studied with the same fervor. (John Everett, Ocean Associates, Inc.)	Changes in cold-related mortality confounded by adaptation, so difficult thus far to isolate climate change effect. WGII Chapter 8.
SPM-482	E-SPM-303	A	4	6	4	7	Should refer to heat-related mortality in Europe, changes in infectious diseases in some areas (as per SR 1.2 and WGII SPM) (Donald Lemmen, Natural Resources Canada)	Wording revised
SPM-483	G-SPM-158	A	4	6	4	7	There are some slight inconsistencies here between these lines and the corresponding ones in the WGII WPM. 1) It was with respect to heat-related mortality that Europe specifically was mentioned in the WGII SPM, not for changes in disease vectors. "... (heat related mortality in Europe, changes in infectious disease vectors in some areas, and the.....)". 2) ..." in northern HIGH AND mid-latitudes" (Add words in CAPS to be consistent with WGII SPM). (Government of Canada)	Wording revised
SPM-484	G-SPM-159	A	4	6	4	7	The geographic reference is incorrect. Furthermore, the direction of effects is not clear from the current text. TS.2 refers to excess heat-related mortality in Europe and Asia, to changes in the distribution of some disease vectors in parts of Europe and Africa, and to longer and stronger allergenic pollen seasons in northern mid- and high latitudes. (Government of European Community)	Wording revised
SPM-485	E-SPM-305	A	4	7	4	7	Under pollen (might go later under health): Add ref: Rogers CA, Wayne PM, Macklin EA, et al. Interaction of the onset and elevated atmospheric CO2 on ragweed (<i>Ambrosia artemisiifolia</i> L.) pollen production. Environmental Health Perspectives. 2006. doi:10.1289/ehp.8549. (Paul Epstein, Harvard Medical School)	Noted, but primary literature not appropriate as basis for SYR.
SPM-486	G-SPM-160	A	4	7	4	7	correct "northern mid-latitudes" in "northern high and mid-latitudes" (Government of Germany)	Wording revised
SPM-487	E-SPM-306	A	4	7			replace "Europe" with mid latitudes (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	Wording revised
SPM-488	E-SPM-307	A	4	7			Delete "in Europe" (Yola Verhasselt, VUB (Vrije Universiteit Brussel))	Wording revised
SPM-489	E-SPM-309	A	4	9	4	9	The headline could be rewritten according to "Some aspects of climate associated processes have not been observed to change" (Gesa Weyhenmeyer, Environmental Assessment)	Sentence deleted. Space limitations

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SPM-490	E-SPM-310	A	4	9	4	9	The header "Some aspects of climate and effects have not been observed to change" is misleading, as most of what is discussed are things we either don't have a long enough record for (eg sea ice) or that we have difficulty measuring, rather than factors we can categorically say have not changed. This heading probably should be changed to something like: "Changes in some aspects of the climate system are unclear" (Andrew Watkins, National Climate Centre, Australian Bureau of Meteorology)	Sentence deleted. Space limitations
SPM-491	E-SPM-313	A	4	9	4	9	It is not clear if "have not been observed" is due to a lack of data, or if observation are enough but there are no signals of change (Stefano Caserini, Politecnico di Milano)	Sentence deleted. Space limitations
SPM-492	E-SPM-316	A	4	9	4	9	"some aspects of climate and effects". Change to some aspects of climate and its effects. (Peter Berry, Health Canada)	Sentence deleted. Space limitations
SPM-493	G-SPM-161	A	4	9	4	9	This sentence reads very awkwardly. I would suggest not trying to lump climate and effects into one sentence. In any case, with respect to the managed systems, it seems it is not so much that they haven't changed, but that the causes of the change are hard to discern. Suggest changing this bolded result to read: "Some aspects of climate have not been observed to change. Changes in human and managed systems have been observed but are difficult to attribute to any one cause." (Government of Canada)	Sentence deleted. Space limitations
SPM-494	G-SPM-162	A	4	9	4	9	This sentence is not clear. What is meant by effects? The effects of climate change that have not been observed, even though climate change has taken place? (Government of European Community)	Sentence deleted. Space limitations
SPM-495	E-SPM-311	A	4	9	4	23	Should ENSO be mentioned here? No clear evidence, as yet, for significant changes in this system which has major impacts (Janice Lough, Australian Institute of Marine Science)	Sentence deleted. Space limitations
SPM-496	E-SPM-312	A	4	9	4	30	Section "Some aspects of..." The general section heading is "observed climate changes and their effects" and it seems rather odd to include changes that have not been observed under that heading. (Kenneth Möllersten, Swedish Energy Agency)	Sentence deleted. Space limitations
SPM-497	E-SPM-314	A	4	9	4	30	I would suggest to put (line 9 to line 23) after (line 25 to line 30) to put at the end of the section the aspects of climate change where there is less evidence of observed changes, which seems more logic (Jean-Yves Caneill, EDF)	Sentence deleted. Space limitations
SPM-498	E-SPM-315	A	4	9	4	30	delete lines (Hugo Beltrami, St. Francis Xavier University)	Sentence deleted. Space limitations

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SPM-499	E-SPM-308	A	4	9			this doesn't read right. Suggest 'Climate-related factors which have not been observed to change' (Philip Woodworth , Proudman Oceanographic Laboratory)	Sentence deleted. Space limitations
SPM-500	E-SPM-317	A	4	11	4	12	Why is there no mention of the very large change in krill amount (something like 90%)--which is likely as a result of environmental changes. (Michael MacCracken, Climate Institute)	Sentence deleted. Space limitations
SPM-501	E-SPM-321	A	4	11	4	12	The sentence on sea ice extent changes is not quite correct. The "trends" are simply over the satellite era (1973-present) and this relatively short period is the reason that we have no significant trends. Hence prefer that we don't use the term "statistically significant" in this context. The work of Curran et al (2003) in Science suggests that there have been changes in sea ice extent on longer timescales, and clearly since 1950. Whilst this is for a single sector in Antarctica, this sector correlates well with the all-Antarctic sea ice edge. Hence I believe a better sentence for Antarctic sea ice would be: "Antarctic sea ice extent shows localised changes, but satellite observations have not been available for a long enough period to determine any clear average trend." (Andrew Watkins, National Climate Centre, Australian Bureau of Meteorology)	Sentence deleted. Space limitations
SPM-502	E-SPM-318	A	4	11	4	15	When we identify evidence for a global-scale change, MOC is special. Even though a change in the Atlantic Ocean might be considered as a regional one, it should be taken as the evidence for the Global Conveyor Belt, since the Belt starts in the North Atlantic and takes long time to reach the Pacific. (Motoyoshi Ikeda, Hokkaido University)	Sentence deleted. Space limitations
SPM-503	E-SPM-320	A	4	11	4	15	There are many climatic variables that did not show a long-term change, and also there are many that show a change somehow positive for human and ecosystems. The authors may need to explain why they only choose these rather than those? (Guoyu Ren, National Climate Center)	Sentence deleted. Space limitations
SPM-504	E-SPM-319	A	4	11			This statement does hide significant trends within part of the Antarctic region, notably west of the Antarctic Peninsula (Peter Convey, British Antarctic Survey)	Sentence deleted. Space limitations
SPM-505	G-SPM-163	A	4	12	4	13	The description here of MOC issues is complicated for the reader also because MOC is a new term to many readers. Consider a rewrite to increase the readability. (Government of Norway)	Sentence deleted. Space limitations
SPM-506	E-SPM-322	A	4	12	4	14	It has been found that dust storm in northern China and central Asia decreases in frequency during the past half a century. (Guoyu Ren, National Climate Center)	Sentence deleted. Space limitations
SPM-507	E-SPM-323	A	4	12			Add 'or data' after 'evidence' (Javier Martin-Vide, Group of Climatology)	Sentence deleted. Space limitations

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SPM-508	E-SPM-324	A	4	12			"insufficient evidence to determine trends": please clarify whether there is not enough data to see a trend if it was there -or- if there is evidence of the absence of any trend (as if any trend is too small to see) (Leonard Allen Smith, London School of Economics)	Sentence deleted. Space limitations
SPM-509	E-SPM-325	A	4	13	4	13	Meridonal overturning circulation' is jargon and needs to be explained. (John R. Porter, University of Copenhagen)	Sentence deleted. Space limitations
SPM-510	E-SPM-326	A	4	13	4	14	insufficient evidence to determine trends in MOC' ?? Is this consistent with what is stated later on page 13, line 9 to line 18? (Michel Rixen, NATO Undersea Research Center)	Sentence deleted. Space limitations
SPM-511	E-SPM-331	A	4	14	4	14	Insert 'annual total number of Tcs', to avoid confusion with intense Tcs earlier. (Michael Manton, Monash University)	Sentence moved; WGI SPM wording.
SPM-512	G-SPM-164	A	4	14	4	14	This sentence can be confusing since there is an increase in the intensity but not in the total number of tropical cyclones. The sentence can also be understood as related only to tropical areas, but in many cases hurricanes is included in the numbers. We suggest that the phrase "total global annual number" is used instead of "annual number" and that number is put in italics. Furthermore it could be made clear whether or not tropical cyclones here include hurricanes and typhoons. (Government of Norway)	Sentence moved; WGI SPM wording.
SPM-513	G-SPM-166	A	4	14	4	14	Delete "clear" (Government of Netherlands)	Sentence moved; WGI SPM wording.
SPM-514	E-SPM-327	A	4	14	4	15	This should say that "There is no clear global trend" as there is a trend in the Atlantic. Also, at the end of the sentence, a phrase should be added "cyclones, although there are some indications of increasing intensity." (Michael MacCracken, Climate Institute)	Sentence moved; WGI SPM wording.
SPM-515	E-SPM-328	A	4	14	4	15	The sentence referring to tropical cyclones does not make it clear what region or strength we are talking about, as regionally there have been some changes in strong tropical cyclones. Would be better to say: "There is no clear global trend in the total number of tropical cyclones." (Andrew Watkins, National Climate Centre, Australian Bureau of Meteorology)	Sentence moved and changed to: "There is evidence for an increase of intense tropical cyclone activity in the Atlantic north of the equator since about 1970. There is no clear trend in the global numbers of tropical cyclones per year."
SPM-516	E-SPM-330	A	4	14	4	15	Is the absence of a trend in the annual number of tropical cyclones true in all regions? (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Sentence moved; WGI SPM wording.
SPM-517	G-SPM-165	A	4	14	4	15	The statement "There is no clear trend in the annual number of tropical cyclones" does not seem to fit well under this section. Wherever this statement appears, "global" should	Sentence moved.

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							be added between “clear” and “trend”. (Government of United States)	
SPM-518	G-SPM-9	B	4	14	4	15	The comment on tropical cyclones does not seem to be entirely consistent with that on p1 line 32. Need clearer drafting on intensity vs number (Government of United Kingdom)	Sentence moved to combine statements.
SPM-519	E-SPM-329	A	4	14			no trend in the annual global number of tcs (Gabriele Hegerl, Duke University)	Sentence moved; WGI SPM wording.
SPM-520	G-SPM-167	A	4	15	4	15	“There is no clear trend in the annual number of tropical cyclones”. Perhaps, “total number”, because intense cyclones becomes more frequent in the Northern Atlantic region (see page 1). (Government of Russian Federation)	Sentence moved; WGI SPM wording.
SPM-521	E-SPM-332	A	4	15	4	21	Insert after cyclones ", even though there is evidence of an increase of intense tropical cyclone activity in the North Atlantic since 1970." (John Church, CSIRO)	Sentence moved and combined with other statement; WGI SPM wording.
SPM-522	E-SPM-333	A	4	16	4	16	Indicate at what level in the atmosphere the westerlies have strengthened, e.g. "upper-level westerlies" or "low-level westerlies". (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Comment does not apply.
SPM-523	E-SPM-334	A	4	17	4	20	Very unclear. What responses occur outside of adaptation? Are the responses you are looking for not actual adaptations? What then does this sentence mean? The key point here is that there are many responses to climate change in human systems because human societies continue to manage risks associated with climate variability. What is difficult to detect in many cases is whether these responses are generally effective and whether a more rapidly changing climate is making it more difficult to devise and implement effective responses. It is inaccurate to imply that it is difficult to detect adaptations. (Peter Berry, Health Canada)	Paragraph deleted. Space limitations.
SPM-524	E-SPM-335	A	4	17	4	20	This paragraph is out of place under heading of no observed changes - it may warrant its own section. (Donald Lemmen, Natural Resources Canada)	Paragraph deleted. Space limitations.
SPM-525	E-SPM-336	A	4	17	4	20	It seems quite possible to determine impacts from climate change in coastal regions and water catchments, particularly sea level rise, extreme storm events, and temperature and precipitation changes. Other human interactions combine with climate change to potentially increase the impact of these events; however they do not mask these climate changes. A big future challenge will be to monitor how existing human uses - such as coastal development, fishing/overfishing, land-based nutrient pollution, other forms of pollution and contamination and water uses- that will combine with and increase the negative impacts of climate change. (Magdalena Muir, Environmental and Legal Services Ltd.)	Paragraph deleted. Space limitations.

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SPM-526	G-SPM-168	A	4	17	4	20	While this topic (why it is difficult to observe climate responses in some cases) is relevant to scientists we wonder about its relevance for policy makers, and suggest it be omitted. (Government of New Zealand)	Paragraph deleted. Space limitations.
SPM-527	G-SPM-169	A	4	17	4	23	This information belongs logically to the text piece from p.3, line 21 to p. 4, line 7. It could also be dropped. (Government of European Community)	Paragraph deleted. Space limitations.
SPM-528	E-SPM-338	A	4	18	4	18	Comment: There is a problem here since adaptation is also unambiguously a response. This paragraph is saying that certain responses are difficult to detect due to the specified factors. Adaptation is then cited as one of them. I'm afraid I'm not sure what to do about this other than perhaps saying "...difficult to detect due to masking by adaptation response measures and the effects of non-climatic drivers...." etc etc) (Pat Finnegan, Grian)	Paragraph deleted. Space limitations.
SPM-529	E-SPM-337	A	4	18	4	20	It doesn't seem worthwhile giving a list of non-climatic driving factors, since this will depend entirely on the system being examined, and a complete list would be very long. (Nathan Gillett, University of East Anglia)	Paragraph deleted. Space limitations.
SPM-530	E-SPM-339	A	4	19	4	19	Perhaps indicate the sea level driver here, e.g. "extreme high tides". I assume you don't mean tsunamis. Are storm surges also meant here? If so that could be mentioned, e.g. "extreme high sea level due to tides and storm surge". (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Paragraph deleted. Space limitations.
SPM-531	E-SPM-340	A	4	19	4	20	"and other environmental changes" Does not follow - "other environmental changes are not human interventions. Also, what is a change in a health system? This is so broad as to make this point almost meaningless. Need to provide an example. (Peter Berry, Health Canada)	Paragraph deleted. Space limitations.
SPM-532	E-SPM-341	A	4	21	4	21	Add a reference to WGII chapter 4 "Ecosystems" (section 4.2.2) (Andreas Fischlin, Integrative Biology - Systems Ecology)	Paragraph deleted. Space limitations.
SPM-533	G-SPM-171	A	4	22	4	22	Insert "observational" before "data and "scientific" before "literature" for clarity. (Government of United States)	Sentence moved; WGII SPM wording.
SPM-534	E-SPM-342	A	4	22	4	23	This sentence could not be a paragraph, i.e. - to begin at new row (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Sentence moved and combined with information on data.
SPM-535	E-SPM-343	A	4	22	4	23	It is very correct to indicate the notable lack of geographic balance in data and literature on observed changes. But why do not the IPCC authors make efforts to use as many as possible the non-English publications. There are a lot of Chinese papers on observed change in climate, for example. (Guoyu Ren, National Climate Center)	Non-English literature has been incorporated in assessment.

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SPM-536	E-SPM-344	A	4	22	4	23	Is it a lack of studies (whether they indicate significant change or not) or a lack of studies that report significant changes (may report no change). This should be clarified in order to interpret the spatial patterns in Fig. SPM-2. Also, this statement should appear earlier on page 2 (see earlier comment [TSU note: See Comment E-SPM-288-A]). (Sharon Smith, Geological Survey of Canada)	Clarified in figure caption. Sentence moved earlier in SPM text.
SPM-537	E-SPM-345	A	4	22	4	23	general comment which could be added here : most of the measurements are done in the Northern hemisphere. This unequal geographical distribution can produce some bias in the given values (Nicole Lenotre, BRGM)	Sentence moved; WGII SPM wording.
SPM-538	E-SPM-346	A	4	22	4	23	Can some emphasis be put on this statement? (Andy Morse, University of Liverpool)	Sentence moved and combined with information on data.
SPM-539	E-SPM-347	A	4	22	4	23	a very important point, which requires elaboration. Also, is there more research on China and India than the rest of the developing world? How about small island developing states? (Peter Haas, University of Massachusetts)	Comment not clear.
SPM-540	G-SPM-170	A	4	22	4	23	This observation about data from some areas does not mean that climate has not changed. The sentence belongs elsewhere. (Government of United States)	Sentence moved.
SPM-541	G-SPM-172	A	4	22	4	23	A very important point, which may benefit from elaboration. Also, is there more research on China and India than the rest of the developing world? How about small island states? (Government of United States)	Comment not clear.
SPM-542	G-SPM-10	B	4	22	4	23	This paragraph would fit better further up (e.g. p2), it should be linked with fig SPM-2 (Government of United Kingdom)	Sentence moved.
SPM-543	E-SPM-348	A	4	23	4	23	Insert 'in developing countries and the southern hemisphere'. (Michael Manton, Monash University)	Current text is WGII SPM approved language.
SPM-544	E-SPM-349	A	4	25	4	25	Why only rising carbon dioxide concentrations? What about concentrations of sulfate, nitrogen etc.? (Gesa Weyhenmeyer, Environmental Assessment)	Section deleted, lack of space.
SPM-545	E-SPM-352	A	4	25	4	25	Please omit heading, only confusing. Keep heading at line 9. (Caroline Leck, Department of Meteorology)	Section deleted, lack of space.
SPM-546	G-SPM-173	A	4	25	4	25	This sentence is rather weak. The term "can" should be dropped, and "on terrestrial and marine ecosystems" should be added at the end. (Government of European Community)	Section deleted, lack of space.
SPM-547	E-SPM-350	A	4	25	4	30	The very short paragraph on non-climate effects really has the implication of downplaying the fact that the effects on ecosystems are expected (probably with high confidence) to be	Section deleted, lack of space.

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							tremendous, in many cases even more dramatic than the non-direct effects due to climate and circulation change; see Table SPM-2, widespread coral bleaching is expected already at a global mean temperature increase of only 1 C, widespread mortality slightly above 2 C; more needs to be stated about this in the main text to give it an appropriate balance. (Mark Lawrence, Max Planck Institute for Chemistry)	
SPM-548	E-SPM-351	A	4	25	4	30	The section on ocean acidification does not appear to deal with observed climate change or its effects at all. It rather deals with effects related to changes in the composition of the atmosphere. (Kenneth Möllersten, Swedish Energy Agency)	Section deleted, lack of space.
SPM-549	E-SPM-353	A	4	25	4	30	non-climate' effects: this is not clearly defined, so title does not reflect what is stated in the body of the text (Michel Rixen, NATO Undersea Research Center)	Section deleted, lack of space.
SPM-550	E-SPM-354	A	4	25	4	30	I think that this brief sub-section is not necessary or it should be situated in another place in the text (Javier Martin-Vide, Group of Climatology)	Section deleted, lack of space.
SPM-551	G-SPM-174	A	4	25	4	30	This is very important section and should be maintained in the final draft. (Government of Japan)	Section deleted, lack of space. Information on clear observed effects is very limited, hence not a high priority.
SPM-552	G-SPM-175	A	4	25	4	30	Authors should consider additional non-climate effects such as CH ₄ , O ₃ , and air quality. For example, methane abundance has more than doubled since 1750 and has caused about half of the increase in tropospheric ozone, thus worsening air quality and impacting human health on a global scale. [WG1 7.4.4] (Government of United States)	Paragraph deleted. Space limitations.
SPM-553	E-SPM-356	A	4	27	4	27	The change in pH is very significant, and its impact should be explained with an extra sentence. (Michael Manton, Monash University)	Paragraph deleted. Space limitations.
SPM-554	E-SPM-359	A	4	27	4	27	It would be clearer to say "Ocean surface waters have become more acidic by 0.1 pH units over the last 200 years." (Michael MacCracken, Climate Institute)	Paragraph deleted. Space limitations.
SPM-555	E-SPM-360	A	4	27	4	27	It should be made clear the increase in acidity of the oceans is due to higher CO ₂ intake (Richard Anyah, Rutgers University)	Paragraph deleted. Space limitations.
SPM-556	E-SPM-361	A	4	27	4	27	Despite concern over the size (number of words/pages), I would suggest that it would be useful to relate the rise in pH of the ocean to the cause. As currently presented, the sentence appears almost out of place (at least to the uninitiated).	Paragraph deleted. Space limitations.

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							(Roger Street, UKCIP-OUCE)	
SPM-557	E-SPM-362	A	4	27	4	27	Change to "The near-surface oceans" (John Church, CSIRO)	Paragraph deleted. Space limitations.
SPM-558	G-SPM-178	A	4	27	4	27	In order to clarify the connection between atmospheric CO2 levels and acidification we suggest the following rewrite: "The uptake of anthropogenic carbon has led to the ocean becoming more acidic with an average decrease in pH of 0.1 units in the last 200 years." (Government of Norway)	Paragraph deleted. Space limitations.
SPM-559	G-SPM-179	A	4	27	4	27	For a policy maker referring only to 0,1 pH units is most probably not very meaningful. Better to express also in relative terms. (Government of European Community)	Paragraph deleted. Space limitations.
SPM-560	G-SPM-180	A	4	27	4	27	Editorial suggestion: " The SURFACE WATERS OF the oceans have become more acidic by 0.1 pH units in the last 200 years AS A RESULT OF ENHANCED UPTAKE OF CARBON FROM THE ATMOSPHERE". This linkage may seem obvious to some readers, but to others, the linkage between the changing atmospheric CO2 and increasing acidity in the ocean may need to be made clear. (Government of Canada)	Paragraph deleted. Space limitations.
SPM-561	E-SPM-355	A	4	27	4	30	The following rephrasing is suggested: Increasing atmospheric CO2 from human activities and through the acidification of the oceans by 0.1 pH units in surface water in the last 200 years can have a direct influence on terrestrial carbon uptake. However, the net effect of this cannot at present be quantified reliably at large scales due to interactions with other factors such as water and nutrient availability. {1.5} (Caroline Leck, Department of Meteorology)	Paragraph deleted. Space limitations.
SPM-562	E-SPM-357	A	4	27	4	30	stomatal response to CO2 rise will also affect runoff and hydrology (this impact has been detected in the historical record and has implications for the future) (Chris Jones, Met Office Hadley Centre)	Paragraph deleted. Space limitations.
SPM-563	E-SPM-358	A	4	27	4	30	Need to provide more information on the role of the oceans in carbon sequestration, and what is known about the risk of acidification, such as the difficulties in forming carbonate structures (certain species of plankton and larger marine ecosystems like coral reefs), and the consequential impacts throughout the coastal and marine foodweb. Once ocean acidification occurs, mitigation is not possible. There will also come a point when CO2 can no longer be absorbed in the oceans, which may soon be occurring in the southern seas. (Magdalena Muir, Environmental and Legal Services Ltd.)	Paragraph deleted. Space limitations.
SPM-564	G-SPM-176	A	4	27	4	30	This paragraph on acidification and terrestrial carbon CO2 uptake should be split into two discrete paragraphs.	Paragraph deleted. Space limitations.

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							(Government of Australia)	
SPM-565	G-SPM-177	A	4	27			It would be better to say "Calculations showed that the oceans have become more acidic by 0.1 pH units in surface water in the last 200 years." This statement (if globally) came from model calculations, not from observational data, and it is essential. (Government of Russian Federation)	Paragraph deleted. Space limitations.
SPM-566	G-SPM-11	B	4	27			This is quite technical for a SYR SPM – Please explain what a 0.1 pH unit reduction means in lay terms? (Government of United Kingdom)	Paragraph deleted. Space limitations.
SPM-567	G-SPM-183	A	4	28	4	28	Please insert the word 'concentrations' after 'CO2', thus: "Increasing atmospheric CO2 concentrations can have ..." (Government of New Zealand)	Paragraph deleted. Space limitations.
SPM-568	E-SPM-363	A	4	28	4	30	These statements really don't say much at all about CO2 fertilization--giving scale as the excuse. A stronger statement should be made. (Michael MacCracken, Climate Institute)	Paragraph deleted. Space limitations.
SPM-569	G-SPM-181	A	4	28	4	30	This sentence about the effect of ocean acidity changes doesn't seem to belong in this section on observed changes. (Government of United States)	Paragraph deleted. Space limitations.
SPM-570	G-SPM-182	A	4	28	4	30	Suggest inserting the sentence beginning on page 7, line 32, of Topic 1. (Government of United States)	Paragraph deleted. Space limitations.
SPM-571	E-SPM-364	A	4	29	4	30	the text states that the effect of ocean acidification 'cannot at present be quantified reliably' yet in Topic 3 (page 6, lines 38-39) the text states that ocean acidification with medium confidence will have negative impact on corals (Thomas Spencer, University of Cambridge)	Paragraph deleted. Space limitations.
SPM-572	E-SPM-365	A	4	30	4	30	Change ".. other factors such as water and nutrient availability." to "... other factors such as water and nutrient availability, and plant stressors such as ozone." REASONING-- ozone levels are increasing, and at least in some regions, functioning to offset (at least partly) increases in plant carbon uptake resulting from CO2 or nutrient fertilization. (Knut Nadelhoffer, University of Michigan)	Paragraph deleted. Space limitations.
SPM-573	E-SPM-366	A	4	33	4	33	using "understanding and attributing changes" to replace "causes of change" (Zong-Ci Zhao, China Meteorological Administration)	Rejected; title is clear and consistent with approved topic heading
SPM-574	E-SPM-368	A	4	33	4	33	Causes of change - what kind of change? Here you refer to atmospheric changes so that it might be good to specify this kind of change	Rejected; title is clear and consistent with approved topic heading

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							(Gesa Weyhenmeyer, Environmental Assessment)	
SPM-575	E-SPM-369	A	4	33	4	33	"causes of change" should include both natural and human-made changes. This topic only concentrates to anthropogenic cause. Suggestion is to add some paragraphs to talk about natural cause. (Zong-Ci Zhao, China Meteorological Administration)	Rejected; title is clear and consistent with approved topic heading
SPM-576	G-SPM-185	A	4	33	4	33	Consider changing heading to "Causes of climate change". (Government of United States)	Rejected; title is clear and consistent with approved topic heading
SPM-577	G-SPM-13	C	4	33	4	33	General remark: The role and evolution of the halocarbons (managed by the Montreal Protocol) should at least be referred to here (e.g., their combined radiative forcing is much larger than that of N ₂ O and well over 50% that of CH ₄), in particular as they are by far those mostly of anthropogenic origin. One should not just deal with the species specifically listed in the Kyoto Protocol, but merge/coordinate the efforts of both! (Government of Belgium)	Rejected. Space limitations prevent this in the SPM.
SPM-578	G-SPM-184	A	4	33	5	19	It is confusing that the first part of this section deals with the recent period 1970 to 2004, while the next part deals with the historic record, from 1750. The natural expectation is that the order would be the opposite. The fact that the first is dealing with emissions, the second with concentrations, is easily overlooked by a lay reader. The distinction needs to be made clearer. (Government of New Zealand)	Rejected. Revised wording should make the flow clearer.
SPM-579	E-SPM-367	A	4	33			Suggested wording: "Drivers of change" (Volodymyr Demkine, UNEP)	Rejected. Plenary-approved topic title must be retained
SPM-580	G-SPM-186	A	4	34	4	34	As per General Comment , this section needs some more introductory text. The one sentence is good, but not enough. Suitable text can be found in either the WGI Technical Summary of the WGI SPM. For example: "The average climate on Earth is determined by incoming energy from the Sun and by the properties of the Earth and its atmosphere. Most important have been changes in....." (From Introduction to Drivers of CC in the WGI Technical Summary.) Alternatively, use text from WGI SPM "Changes in the atmospheric abundance of greenhouse gases and aerosols, in solar radiation and in land surface properties alter the energy balance of the climate system. These changes are expressed in terms of radiative forcing which is used to compare how a range of human and natural factors drive warming or cooling influences on global climate." Also, add a short section on what's new since the TAR, especially noting the stronger evidence about a human role in recent warming. (Government of Canada)	Rejected. Space limitations prevent this.

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SPM-581	G-SPM-14	C	4	35	4	35	make a reference to Lucc ? (Government of Belgium)	Land cover and land use are mentioned briefly
SPM-582	G-SPM-15	C	4	35	4	35	halocarbons occur in fig 2,4 in the full text; therefore it might be useful to address these also in the spm and a little more broadly in the longer syr and the legend to the figure (Government of Belgium)	Rejected. Space limitations prevent this.
SPM-583	E-SPM-371	A	4	35	4	36	delete this sentence (Suam Kim, Pukyong National University)	Rejected. This is a useful sentence, but moved for better flow.
SPM-584	G-SPM-188	A	4	35	4	36	Even though this sentence correctly states that beyond greenhouse gases other factors also influence climate change, it does not add much information and can be difficult to understand for policymakers due to reference to a new term, i.e. Earth Energy Balance, which is not explained. (Government of European Community)	Text revised
SPM-585	G-SPM-12	B	4	35	4	36	Please add "atmospheric" to read: "Changes in the atmospheric concentrations of greenhouse gases and aerosols, land-cover and solar radiation alter the Earth's energy balance.". Should this paragraph be in bold? (Government of United Kingdom)	Accepted; text moved.
SPM-586	G-SPM-187	A	4	35	4	48	The following statement, from Topic 2 page 2 lines 23-26, is significant in this context for policymakers and should be included at this point in the SPM if space allows: "Differences in terms of per capita income, per capita emissions, and energy intensity among countries remain significant. In 2004 UNFCCC Annex I countries held a 20% share in world population, produced 57% of world Gross Domestic Product based on Purchasing Power Parity (GDPppp), and accounted for 46% of global greenhouse gas emissions. {WGIII 1.3} (Government of New Zealand)	Rejected. Space limitations prevent this.
SPM-587	E-SPM-370	A	4	35			This section puts forth the wrong information for the 'Causes of change'. (Suggest title to be: 'Causes and attribution of climate change'). The cause of climate change is the total anthropogenic radiative forcing from 1750 as shown in Figure 2.4. Figure SPM-3 is not particularly relevant here because it shows the sources and trends of one component and is better shown in a mitigation section. So I suggest that Figure SPM-3 be replaced by Figure 2.4 and discussion in this section be changed to describe that figure. An important missing component in this section is aerosols. Aerosols have a large net negative forcing so do much to offset the forcing from GHGs and change the regional nature of the forcing and response and hence, 'can't' be found missing from this section. Somewhere in this section it would be appropriate to point out that the net anthropogenic RF is almost exactly equal the forcing of CO2 alone. This means that all of the other positive terms (largely other GHGs) and negative terms (largely aerosol effects) offset one another to a large extent. However, the	Rejected. The title must remain as it is plenary approved, but covers, emissions, concentrations, radiative forcing, and attribution of climate change, as required in the Plenary approved outline.

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							uncertainties associated with aerosol effects is substantially larger leaving us with a large uncertainty in the net anthropogenic RF as shown by the uncertainty in the associated bar at the bottom of the figure. (David Fahey, NOAA Earth Science Research Laboratory)	
SPM-588	G-SPM-189	A	4	36	4	36	The phrase "the Earth's energy balance" could confuse some readers. Suggest it is replaced with the construction from WG1 "the energy balance of the climate system". (Government of Australia)	Accepted (text moved)
SPM-2132	G-SPM-3	D	4	37	6	22	The four paragraphs in page 5, should be put in line 37 of page 4, to take into account the historical development of the increasing in GHG's emissions. (Government of Argentina)	Rejected. Order is based on underlying topic; emissions are primary cause of change, concentrations are a consequence..
SPM-589	E-SPM-372	A	4	38	4	38	please add: with the increase of, before population, GDP and total primary energy supply, (Bangzhong Wang, China Meterological Administration)	Text revised. Comment no longer relevant
SPM-590	G-SPM-191	A	4	38	4	38	It would be more logical to change the order to "Population, GDP, total primary energy supply, and greenhouse gas emissions have..." (Government of United States)	Text revised. Comment no longer relevant
SPM-591	G-SPM-192	A	4	38	4	38	Insert "global" before GDP. (Government of Australia)	Text revised. Comment no longer relevant
SPM-592	G-SPM-193	A	4	38	4	38	Delete population, GDP : their growth is not relevant to IPCC mission and does not deserve a statement in bold. The statement on lines 47,48 convey the right information (Government of France)	Accepted
SPM-593	E-SPM-2	B	4	38	4	38	GDP - this abbreviation was not previously defined in this document and for people not familiar with scientific vocabulary this might confuse. Plese, define GDP. (Constanta Boroneant, National Meteorological Administration)	Text revised. Comment no longer relevant
SPM-594	G-SPM-16	C	4	38	4	38	spell out 'GDP'as it occurs for the first time in the text or refer to Glossary (Government of Belgium)	Text revised. Comment no longer relevant
SPM-595	E-SPM-373	A	4	38	4	39	My comments exclusively focus on the boldfaced assertion in the Summary: "Greenhouse gas emissions, population, GDP and total primary energy supply have all grown during the period 1970 to 2004." My concern is that some policy makers may be inclined to read increase in GDP as directly causative and directly linked to total greenhouse gas emissions. Elsewhere in the SPM and in several topic areas, this assertion is more nuanced and more carefully explained. Subsequent comments further expand on concern expressed here. The actual IPCC assessment more accurately illustrates that GDP "fueled by unsustainable development" leads to increased emissions, greater vulnerability, and weakened adaptation and mitigation	Text revised. Comment no longer relevant

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							responses. (Peter Liotta, Pell Center for International Relations and Public Policy)	
SPM-596	E-SPM-374	A	4	38	4	44	It seems like lines 38-39 are pretty obvious, why have this in bold? Better would be lines 41-44 in bold. (Mark Lawrence, Max Planck Institute for Chemistry)	Accepted
SPM-597	E-SPM-376	A	4	38	4	48	delete lines (Hugo Beltrami, St. Francis Xavier University)	Text revised, accepted in part.
SPM-598	G-SPM-190	A	4	38	5	5	These three paragraphs and figure should be moved after current figure SPM 4, for properly reflecting the historical approach in exposing the "CAUSES OF CHANGE" (i.e. firstly the reference to GHG concentrations since 1750 (p. 5, lines 8-19); then the reference to temperature growth due to the increase in anthropogenic GHG concentrations since the mid-20th century (p. 5, Lines 21-31 and p. 6, figure SPM 4); and then the reference to GHG emissions in the recent period 1970-2004. (Government of Cuba)	Rejected. Order based on underlying report; emissions are primary cause of change, concentrations are a consequence.
SPM-599	E-SPM-375	A	4	38			Greenhouse gas emissions along with population, global income growth and total primary energy supply ... (Monica Beatriz Wehbe, National University Rio Cuarto)	Text revised. Comment no longer relevant
SPM-600	G-SPM-13	B	4	38			It would be useful to note that emissions have been increasing since the industrial revolution (a graph would be good) but that in this section we will concentrate on the period since 1970 (Why?) (Government of United Kingdom)	Rejected. This is the period for which reliable data are available for many GHGs. Also space limitations.
SPM-601	E-SPM-377	A	4	39	4	39	This bold-face sentence mixes direct and indirect causes together. Greenhouse gas emissions change the Earth's energy balance. Changes in GDP and energy supply by themselves do not by themselves alter the Earth's energy balance, only via greenhouse gases. They should not be given parallel structure in the sentence. Also, "primary energy supply" is not mentioned in the subsequent paragraphs. I suggest "Greenhouse gas emissions grew during the period 1970 to 2004 despite a decrease in global energy intensity." or more simply "Greenhouse gas emissions grew during the period 1970 to 2004." (Daniel Murphy, NOAA Earth System Research Laboratory)	Text revised. Comment no longer relevant
SPM-602	E-SPM-378	A	4	39	4	39	Saying that GDP, population and emissions have grown doesn't really mean anything. Grown exponentially? Significantly? Doubled? (Katherine Casey Delhotal, RTI International)	Text revised. Comment no longer relevant
SPM-603	G-SPM-194	A	4	41	4	41	The authors need to explain how the GHGs are combined to derive this 70% increase? Relative to what baseline period? (Government of Australia)	Accepted

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SPM-604	G-SPM-195	A	4	41	4	41	Add the numerical value of GHG increases, "from 28.7 to 49 GtCO ₂ -eq" for more scientific explanation. The new sentence now reads, "Greenhouse gas emissions have grown by 70% between 1970 and 2004 from 28.7 to 49 GtCO ₂ -eq, with CO ₂ emissions growing by about 80% (28% between 1990 and 2004)". (Government of Japan)	Accepted
SPM-605	E-SPM-379	A	4	41	4	42	The use of two different time intervals makes this sentence unnecessarily confusing. (David Jackson, McMaster Institute for Energy Studies)	Accepted
SPM-606	G-SPM-196	A	4	41	4	44	Absolute figures for emissions in 2004 of CO ₂ and other GHG as well as the total (CO ₂ -equivalent) should be given somewhere, as this is a figure that policymakers often need and is hard to find consistently through the WG reports. (Government of Germany)	Accepted in part
SPM-607	G-SPM-17	C	4	41	4	44	This paragraph is very restrictive in gases involved, yet unclear (fortunately, some clarification can be deduced from Figure SPM-3). (Government of Belgium)	Noted
SPM-608	E-SPM-380	A	4	41			Suggest inserting "anthropogenic" after "Global" to be consistent with the rest of the paragraph. (Volodymyr Demkine, UNEP)	Accepted
SPM-609	E-SPM-383	A	4	42	4	42	Is the rate of CO ₂ emissions really already slowing (i.e., 52% in 20 years from 1970-1990, and only 28% in the 14 years thereafter)? If so, this needs to be emphasized more clearly in the text (as an impetus for further reductions of emissions), otherwise the numbers or the wording need to be checked carefully. (Mark Lawrence, Max Planck Institute for Chemistry)	Text revised; misunderstanding on part of reviewer – percentages do not actually indicate a reduction in growth.
SPM-610	E-SPM-385	A	4	42	4	42	"CO ₂ is the dominant anthropogenic greenhouse gas" refers in this case to emissions but could be interpreted as radiative effect, global warming potential, etc. I suggest removing this and merely stating: "CO ₂ counts for 77% of the total anthropogenic emissions in 2004..." (Richard Allan, University of Reading)	Rejected. CO ₂ is dominant by multiple measures
SPM-611	E-SPM-382	A	4	42	4	43	Need to be specific here in what terms you mean CO ₂ is 77% of anthropogenic emissions. Could be interpreted as 77% by tons or by radiative forcing, for example. Figure SPM-3a suggests it is by radiative forcing, and that should be stated here, as not every reader will understand this without specification. (Michael Mastrandrea, Stanford University)	Related text removed
SPM-612	E-SPM-381	A	4	42	4	44	The metric used to figure out the percentage share needs to be given--is this mass of the emission or weighted by CO ₂ equivalence (which I would recommend--and say so). This also applies to the first sentence. (Michael MacCracken, Climate Institute)	Related text removed

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SPM-613	E-SPM-384	A	4	42	4	44	CO2 is the dominant greenhouse gas but one cannot understand the warming even with constant concentration (Tab SPM-1) if it not mentionned that timelife of CO2 molecule is 125 years at least. Add it here. (Annick Douguédroit, Université de Provence)	Rejected, due to space restrictions
SPM-614	G-SPM-197	A	4	43	4	43	The concept of CO2 equivalent must be introduced in the SPM, before attributing to CO2 77% of the total emissions (see Box 2.1) (Government of France)	Glossary definition
SPM-615	G-SPM-198	A	4	43	4	43	Clarify the 77%. Is it by weight, volume, molecule/mole count, GWP, ...? Add this information to Figure SPM-3. (Government of United States)	Related text removed
SPM-616	G-SPM-199	A	4	43	4	43	"CO2 is the dominant anthropogenic greenhouse gas, accounting for 77% of total anthropogenic emissions ..." Please check the sum of CO2 anthropogenic emission (19,4+2,8+57,4=79,6 % ? or 19+2+57=78% ?) (Government of Germany)	Accepted. Error in Fig SPM-3 (b) fractions corrected
SPM-617	E-SPM-386	A	4	43	4	44	Without a qualifier, it's not obvious what weighting is given to the different greenhouse gases in order to come to the conclusion that CO2 accounts for 77% of total anthropogenic emissions. The uninformed reader might conclude that this was on a mass or volume basis. Possibly it would be clearer to give the fraction of total GHG forcing due to CO2 - 'accounting for x% of the anthropogenic greenhouse affect in 2004'. (Nathan Gillett, University of East Anglia)	Related text removed
SPM-618	E-SPM-387	A	4	43	4	44	As it is not very well known, it is worth to mention that the percentages (here: CO2 accounts for 77 %) are based on a 100 year horizon in applying the GWP for 100 years. Suggestion: Please add '... emissions in 2004 if a 100 year horizon for the global warming potential is applied'. Maybe it is enough if this is explained in the text of Fig. SPM-3 (Manfred Treber, Germanwatch)	Related text removed
SPM-619	E-SPM-389	A	4	43	21	14	..anthropogenic: scientific word incomprehensible for policymakers who don't know Greek language. The best would be to replace it by human-induced in the Introduction as well in the whole Summary. (Annick Douguédroit, Université de Provence)	Glossary
SPM-620	E-SPM-388	A	4	43			77%: it requires some effort to figure out where that number comes from... (Michel Rixen, NATO Undersea Research Center)	Related text removed
SPM-621	G-SPM-200	A	4	44	4	44	Remove the "for details see" in this sentence and just place Figure SPM-3 in brackets which is the convention used in the rest of the document. (Government of Canada)	Accepted

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SPM-622	G-SPM-201	A	4	45	1	45	Insert the following paragraph from the SPM from the AR4 WG III report: "In 2004 UNFCCC Annex I countries held a 20% share in world population, produced 57% of world Gross Domestic Product based on Purchasing Power Parity (GDPppp) and accounted for 46% of global GHG emissions" (Government of Switzerland)	Rejected. Space limitations prevent this.
SPM-623	E-SPM-394	A	4	46	4	46	I suggest to report the meaning of energy intensity to improve the readability of the text. The meaning is explained in the glossary, but it seems better to write ... energy intensity (the ratio of energy use to economic or physical output),,, (Stefano Caserini, Politecnico di Milano)	Glossary
SPM-624	E-SPM-396	A	4	46	4	46	Define "global energy intensity" for those of us that are not in the field. (Peter Berry, Health Canada)	Glossary
SPM-625	E-SPM-398	A	4	46	4	46	"global energy intensity" needs to be defined. (Michael MacCracken, Climate Institute)	Glossary
SPM-626	G-SPM-202	A	4	46	4	46	The term "global energy intensity" may not be clear to some audiences. Suggest a brief parenthetical definition. (Government of United States)	Glossary
SPM-627	G-SPM-207	A	4	46	4	46	suggest inserting "greenhouse gas" between global and emissions (Government of Republic of Korea)	Accepted
SPM-628	G-SPM-210	A	4	46	4	46	Editorial suggestion. "The effect on global emissions of decreases in (i.e. improvements in) global energy intensity....." This is often confusing and adding the brief explanation in the brackets that a decrease in energy intensity is equivalent to an improvement in energy intensity would be helpful. (Government of Canada)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-629	E-SPM-397	A	4	46	4	47	"The effect of the decrease in global energy intensity...to 2004 on global emissions has been smaller..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-630	E-SPM-390	A	4	46	4	48	This sentence is unclear. It requires an in-text definition of 'global energy intensity'. This term is not in the glossary. (Steven Clemens, Brown University)	Rejected. In Glossary for SyR
SPM-631	E-SPM-391	A	4	46	4	48	The sentence should be rephrased for greater clarity and to add information as follows: "The effect on global emissions during the period 1970 to 2004 of growth in worldwide per capita income (77%) and population (69%) was greater than the effect of the decrease in global emissions intensity (-43%), most of which was due to a decrease in energy intensity (-33%)." (Kenneth Ruffing, N/A)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-632	E-SPM-392	A	4	46	4	48	The fourth parameter affecting anthropogenic emissions, carbon intensity, is omitted from this finding. It needs to be included. Overall between 1970 and 2004, carbon intensity decreased. However, the decline in carbon intensity ceased in 2000, and carbon intensity has increased slightly since then. (Robert Siveter, IPIECA)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-633	G-SPM-203	A	4	46	4	48	The sentence should state at the beginning rather than at the end that it is concerned with *energy-related CO2* emissions. Energy intensity needs to be explained and the conclusions of carbon intensity of WG III should be added. (Government of European Community)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-634	G-SPM-204	A	4	46	4	48	The sentence is quite complicated. Could the sentence read as follows: "Although the global energy intensity has decreased (-33%) during 1970 to 2004, the global emissions have grown due to the combined effect of global income growth (77%) and global population growth (69%); both..." (Government of Finland)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-635	G-SPM-205	A	4	46	4	48	The phrase is unclear, especially for policymakers and the public: "The effect on global emissions of the decrease in global energy intensity (-33%) during 1970to 2004 has been smaller than the combined effect of global income growth (77 %) and global population growth (69%); both drivers of increasing energy-related CO2 emissions." (Government of Russian Federation)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-636	G-SPM-206	A	4	46	4	48	The fourth parameter affecting anthropogenic emissions (carbon intensity) is omitted from this finding. It needs to be included. Overall between 1970 and 2004, carbon intensity decreased. However, the decline in carbon intensity ceased in 2000, and carbon intensity has increased slightly since then. (Government of United States)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-637	G-SPM-209	A	4	46	4	48	may be deleted, as they do not directly explain the Causes of Change, but link it to population growth and income growth. These lines may be replaced by the text "The largest growth in global GHG emissions between 1970 and 2004 has come from the energy supply sector (an increase of 145%). The growth in direct emissions in this period from transport was 120%, industry 65% and land use, land use change, and forestry 40%." (Government of India)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-638	E-SPM-3	B	4	46	4	48	The sentence is not clear: it is not clear to what kind of "global energy intensity" the text refers. Please, reformulate the sentence or remove it because, as it is it gives no clear information. (Constanta Boroneant, National Meteorological Administration)	Glossary definition

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-639	G-SPM-18	C	4	46	4	48	This paragraph is even less comprehensible, primarily because of series of expressions having different statistical significances (demanding consultation of the Glossary). (Government of Belgium)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-640	E-SPM-393	A	4	46			Not all policy makers may be familiar with the concept of energy intensity. It should be defined here. (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Glossary
SPM-641	E-SPM-395	A	4	46			Global energy intensity should be defined. (Robert Molinari, University of Miami)	Glossary
SPM-642	G-SPM-208	A	4	46			Since many readers probably will not be familiar with the term energy intensity, we propose the following rewriting: "The effect from energy conservation measures during 1970 to 2004 (global energy intensity down 33%) has been smaller than..." (Government of Norway)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-643	E-SPM-399	A	4	47	4	47	"global income growth" means total GDP? or GDP per capita? (Toshihiko Masui, National Institute for Environmental Studies)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-644	G-SPM-211	A	4	47	4	47	suggest inserting "energy" between global and income (Government of Republic of Korea)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-645	G-SPM-212	A	4	47	4	47	Consider changing "has been smaller than" to "has been offset by", which makes the meaning a bit clearer. (Government of United States)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-646	G-SPM-213	A	4	48	4	48	An important sentence from Topic 2.1 is missing, please add: "The long-term trend of a declining carbon intensity of energy supply reversed after 2000. Investments today are again more carbon intensive than before 2000. {2.1}" (Government of Germany)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-647	G-SPM-19	C	4	48	4		replace ';' by ',' (Government of Belgium)	Paragraph deleted and merged with preceding text for focus on energy and carbon intensity trends only.
SPM-648	E-SPM-400	A	5	1	5	1	please adding "estimated" before "Global...." (Zong-Ci Zhao, China Meteorological Administration)	Rejected; understates knowledge of emissions for this period.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-649	E-SPM-402	A	5	1	5	1	Can "reduction in tundra ponds" be mentioned here with permafrost instability? (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Comment appears unrelated to text.
SPM-650	G-SPM-215	A	5	1	5	1	The footnotes for figure SPM-3c are missing (Government of Norway)	Accepted – footnote references deleted.
SPM-651	G-SPM-216	A	5	1	5	2	The comments for the used footnotes 1) to 7) in the graph are missing. (Government of Germany)	Accepted – footnote references deleted.
SPM-652	G-SPM-219	A	5	1	5	2	Consider spelling out fluorine in the graphic (instead of F-gases). Are chlorine compounds treated in the figure? (Government of United States)	Glossary
SPM-653	E-SPM-401	A	5	1	5	5	In the figure, indicate if the pie chars are done as CO2 equivalent. (Michael MacCracken, Climate Institute)	Accepted
SPM-654	G-SPM-214	A	5	1	19	10	Why are the units for the ordinate scales in Figures SPM-3, SPM-6, and SPM-7 in Gt CO2 and the units for the ordinate in Figure SPM-8 in Gt C? One or the other should be used throughout the report. (Government of United States)	Figure SPM-8 changed to Gt CO2.
SPM-655	G-SPM-217	A	5	1			Figure SPM 3(c): The authors need to either explain or delete the footnotes on each of the sectors included in the Figure. (Government of Australia)	Accepted – footnote callouts deleted.
SPM-656	G-SPM-218	A	5	1			Figure SPM 3(b): The authors need to recalibrate this figure as the pie chart currently equals 102.9%. Is it possible that the "CO2 (other)" component has been double counted? (Government of Australia)	Accepted – errors corrected.
SPM-657	E-SPM-403	A	5	3	5	3	What are 'F gases'? - needs explaining. (John R. Porter, University of Copenhagen)	Glossary
SPM-658	E-SPM-405	A	5	3	5	3	The figure shows "emissions," not "trends"--one can see they are changing, but this does not mean what is shown is a trend. (Michael MacCracken, Climate Institute)	Accepted
SPM-659	G-SPM-20	C	5	3	5	4	define F-gases (is it just SF6?); not completely excluded from the Figure, as they appear in SPM-3(b). (Government of Belgium)	Glossary
SPM-660	G-SPM-221	A	5	3	5	5	We suggest to rewrite the following sentences: "Global Anthropogenic Greenhouse Gas Emission Trends..." and "Share of different anthropogenic greenhouse gases of total emissions in 2004".	Accepted

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							(Government of Norway)	
SPM-661	E-SPM-404	A	5	3			Uninitiated will be confused by "F-gases" (Joanna Haigh, Imperial College)	Glossary
SPM-662	E-SPM-406	A	5	3			F-Gases: Add footnote about F-Gases (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	Glossary
SPM-663	E-SPM-407	A	5	3			caption of the footnotes is missing (Gabriele Hegerl, Duke University)	Accepted – footnote callouts deleted.
SPM-664	G-SPM-220	A	5	3			Does the figure on f-gases include CFCs and other gases covered by the Montreal protocol? (Government of Norway)	Glossary
SPM-665	G-SPM-222	A	5	4	5	4	The concept of CO2 equivalent must be introduced in the SPM, the first time this concept is used, i.e.before attributing shares of the total emissions (see Box 2.1) (Government of France)	Glossary
SPM-666	E-SPM-408	A	5	5	5	6	As suggested in my previous comment, the caption for SPM-3b and 3c should specify that these percentages are calculated based on share of total radiative forcing rather than some other measure. (Michael Mastrandrea, Stanford University)	Accepted. CO2 equivalent
SPM-667	E-SPM-409	A	5	7			I suggest to include in the SPM - Section 2,1 the Fig. 2.2 (Distribution of regional greenhouse gas by population and GDP). The differences in CO2 emissions between countries are very important (Stefano Caserini, Politecnico di Milano)	Rejected. Space limitations
SPM-668	E-SPM-410	A	5	8	5	12	The first half of this paragraph focuses exclusively on greenhouse gas buildup and the attribution of GHG increase to human activity, but at the end there is a leap to warming. By itself this is OK, but the effects go well beyond warming, and I suggest adding a clause that acknowledges that here and thus reminds the reader of (or prepares the reader for) other sections that address these multiple consequences. (Noel Gurwick, Carnegie Institution)	Other effects on the climate system are explicitly stated in SPM.
SPM-669	G-SPM-224	A	5	8	5	12	The temporal reference "many thousand years" is too weak, given that WG1 TS.2.1.1 refers to the last 650.000 years. The text should be added to reflect the full length of the historical record from ice cores. (Government of European Community)	Accepted – reference to ice core record for CO ₂ added.
SPM-670	E-SPM-411	A	5	8	5	19	For goodness sake, don't be so timid about showing the Dome C CO2 record (forget the rest) versus the present! You are underselling the magnitude of this problem by only discussing the last fw thousand years! This figure should be in your SPM! TSU note: This suggested Figure	Text revised to give ice core record for CO ₂

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							is available in the Appendix] (Tom Crowley, Duke University)	
SPM-671	G-SPM-225	A	5	8	5	19	The following statement, from Topic 2 page 3 lines 25-27, is significant in this context for policymakers and should be included at this point in the SPM if space allows: "The annual CO2 concentration growth-rate was larger during the last 10 years (1995-2005 average: 1.9 ppm per year), than it has been since the beginning of continuous direct atmospheric measurements (1960-2005 average: 1. 4 ppm per year)" (Government of New Zealand)	Rejected due to space limitations
SPM-672	G-SPM-223	A	5	8			We think that F-gases should be mentioned in in this context and propose that the following sentences are added by the end of this paragraph: "In recent decades synthetic fluorinated greenhousegases (eg. CFCs and HFCs) have also been introduced into the atmosphere. Although the total effects of these gases are limited compared to the other 3 gases, some of the fluorinated gases are very long lived and have large global warming potentials." (Government of Norway)	Rejected due to space limitations
SPM-673	G-SPM-21	C	5	10	5	12	" Sentence should begin with : This implies that there is..." (Government of Belgium)	Rejected. Plenary approved text
SPM-674	G-SPM-14	B	5	10			Please replace "many thousands of years" with actual figures or range of dates. (Government of United Kingdom)	Rejected. Plenary approved text
SPM-675	G-SPM-226	A	5	11	5	12	This sentence makes sense only if complemented by a quantitative estimate such as in topic 2, page 5, line 3. It could be deleted here as it duplicates the next statement starting line 21 (Government of France)	Text revised; insufficient space to give detailed numbers, information is in longer report.
SPM-676	E-SPM-412	A	5	12			"one of warming" must be rephrased. (Kenichi Matsuoka, University of Washington)	Rejected. Plenary approved text
SPM-677	G-SPM-229	A	5	14	5	14	Insert "atmospheric" after "global" for clarity. (Government of Australia)	Rejected
SPM-678	E-SPM-413	A	5	14	5	16	The word "land-use" may not be familiar to some people. Add some examples. (Shigeki Kobayashi, Toyota Research and Development Laboratories, Inc.)	Glossary
SPM-679	G-SPM-227	A	5	14	5	16	Sentence in these lines is not in line and change the meaning of the assessment provided in the SPM-WG1 and the Report of WG1. Should be changed to the text in the SPM-WG1: "The primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use, with land use change providing another significant but smaller contribution"	Rejected. Shorter headline is from Plenary approved text for WGI SPM

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							(Government of Brazil)	
SPM-680	E-SPM-414	A	5	14	5	19	delete lines (Hugo Beltrami, St. Francis Xavier University)	Rejected, no justification.
SPM-681	G-SPM-228	A	5	14	5	19	It would be useful to include a new sentence between the second and third sentences (on line 16) along the lines of: "The concentrations of methane and nitrous oxide have been relatively static over recent years compared to the rapid increase in carbon dioxide concentration." This is useful information for a policymaker. (Government of New Zealand)	Rejected space limitations
SPM-682	E-SPM-416	A	5	15	5	15	Should read: 'methane (CH4) and nitrous oxide (N2O)' to be consistent with SPM-3 legend. (John R. Porter, University of Copenhagen)	Text revised
SPM-683	G-SPM-230	A	5	15	5	15	It may be worthwhile specifying that it is Energy Supply, Industrial and Transport use of fossil fuels that are the primary contributors to CO2. This would link the sentence to Figure SPM-3 much like the succeeding information linking methane and nitrous oxide to agriculture. Doing so would also make the connection to page 20 lines 24-31 in discussing where CO2 reductions must come from. This would also be consistent with information contained in SYR Topic 2, p 2, lines 9-11. (Government of Canada)	Rejected space limitations
SPM-684	E-SPM-415	A	5	15	5	16	the emission source "fossil fuel use" is very specific (as opposed to, eg., energy use or energy conversion) whereas land-use change is less specific and agriculture is highly unspecific. If possible, pls specify for agriculture what the major source is on a level of specificity similar to that of energy-related emissions. (Kenneth Möllersten, Swedish Energy Agency)	Rejected space limitations
SPM-685	E-SPM-417	A	5	15			Need to also refer to land use and sea use changes, due to the impact for greenhouse gas sequestration and releases of changes to coasts and wetlands. (Magdalena Muir, Environmental and Legal Services Ltd.)	Rejected already covered
SPM-686	G-SPM-231	A	5	16	5	17	Delete the sentence, as the warming influence is discussed in the next statement starting line 21 (Government of France)	Accepted
SPM-687	E-SPM-418	A	5	16	5	18	On what basis is this finding only "very likely"--this is clearly the case for the last 10,000 years--perhaps if one said this for 10,000,000 years using "very likely" would be appropriate. Why qualify this sentence and not some of the other ones that also report well-established results. (Michael MacCracken, Climate Institute)	Text revised
SPM-688	E-SPM-420	A	5	17	5	17	It seems to me that "very likely" understates the probability. Don't icecore and other data (as shown in Figure 2.3, Topic 2) suggest the likelihood here is "virtually certain"?	Text revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Knut Nadelhoffer, University of Michigan)	
SPM-689	E-SPM-419	A	5	17	5	19	only 10,000 years? (Noel Gurwick, Carnegie Institution)	Text revised
SPM-690	E-SPM-421	A	5	17	5	22	I'm surprised that only "very likely" is used at its two locations on this pg. MY understanding of the data is that "extremely likely" is more appropriate in both places. (Herman Sievering, University of Colorado)	Rejected Plenary approved language
SPM-691	E-SPM-422	A	5	18	5	18	Insert: "particularly anthropogenic aerosols" after "Aerosols" (So reads: "Aerosols, particularly anthropogenic aerosols, have partly offset...." etc etc) (Pat Finnegan, Grian)	Accepted
SPM-692	G-SPM-232	A	5	18	5	18	the sentence starting with "Aerosols" may be prefixed with "It is likely that", and "influence" be replaced with "influenced". It is necessary to incorporate the confidence level in this sentence. (Government of India)	Text revised
SPM-693	G-SPM-233	A	5	18	5	18	suggest inserting "Volcanic and anthropogenic" in front of "Aerosols" (Government of Republic of Korea)	Rejected. Text revised.
SPM-694	G-SPM-234	A	5	18	5	19	Suggest adding to this paragraph a new sentence that addresses land-cover changes. This is necessary to substantiate inclusion of this factor in the introductory lines to this section describing causes of climate change (see page 4 lines 35-36). Suggest "Changes in surface albedo due to land cover changes have also exerted a small cooling effect." Changes in solar radiation are also mentioned in the Intro text, but the effect of volcanoes and the sun are discussed in lines 26-31 of this page and therefore there it is not necessary to do so in this paragraph as well. (Government of Canada)	Rejected space limitations
SPM-695	G-SPM-235	A	5	18	5	19	Suggest abbreviating this sentence to the statement that "Aerosols have partly offset this warming effect." The rest of the sentence seems spurious here and confusing. Both indirect and direct effects are captured in the simple phrase that aerosols have offset some of the warming. (Government of Canada)	Accepted
SPM-696	G-SPM-236	A	5	18	5	19	It is not said in which direction cloud lifetimes and precipitation are influenced. If this is a robust result, it should be said in which direction it goes. Otherwise, the sentence should be deleted. (Government of France)	Text revised

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SPM-697	G-SPM-237	A	5	18	5	19	A misleading phrase: "Aerosols have partly offset this warming effect ..." . What kind of aerosols? Black carbon? Sulfate? They have different effects. The statement should be clarified. (Government of Russian Federation)	Text revised
SPM-698	G-SPM-15	B	5	18			Suggest to change "cloud lifetimes" to simply "cloudiness" (Government of United Kingdom)	Text revised
SPM-699	G-SPM-238	A	5	19			add after "precipitation" the sentence "yet remains a large source of uncertainty in radiative forcing" to be consistent with the corresponding statement in the SPM of WGI. (Government of Kingdom of Saudi Arabia)	Text revised
SPM-700	G-SPM-239	A	5	20	5	20	The results described in 2.3 Feedbacks and climate sensitivity are a significant progress relative to TAR and must be included here, in particular the precise estimates of uncertainties on climate sensitivity, and the importance of the feedbacks. (Government of France)	Rejecte due to space limitations; climate sensitivity and carbon cycle findings are included in later relevant parts of the SPM.
SPM-701	E-SPM-423	A	5	21	5	21	What aspect of agriculture? We have had agriculture for a long time. (Peter Berry, Health Canada)	Rejected space limitations
SPM-702	E-SPM-426	A	5	21	5	21	..since the mid-20th century..Second warming period during the 20th century began in the 70's; temperatures were lower between the 40's and the 60's. See SPM-4. So mid-20th , the past 50 years and past fifty years must be replaced by since the 70's, the past three decades and the past three decades. (Annick Douguédroit, Université de Provence)	Rejected Plenary approved text
SPM-703	E-SPM-424	A	5	21	5	24	Redundant -- you said in the paragraph before last that there is very high confidence that the net effect of human activity has been warming. So it's repeated -- very high confidence (above) and very likely (here). Although 'very likely' and 'high confidence' have different meanings within the vocabulary of the IPCC, that vocabulary is not defined her and this is supposed to be a summary for policy-makers. To the untrained eye, these two paragraphs -- separated by a third paragraph in between simply say the same thing and it comes across as both sloppy writing structure and inconsiderate of the reader. If the aim of this document is to reach a broad community of people with the key messages from the IPCC AR4, then this kind of problem seriously interferes with that aim. It makes the document very difficult to follow. As a member of the scientific community with a commitment to contributing to society, I find this extremely frustrating. (Noel Gurwick, Carnegie Institution)	Text revised
SPM-704	E-SPM-425	A	5	21	5	24	I believe the argument for anthropogenic warming would be significantly enhanced if in addition to Figure SPM-4 there was additional figure contrasting the observed pattern of global warming shown in Figure SPM-2 with the predicted pattern of global warming - eg the map shown in Figure 3.1 of Topic 3 for Scenario A1B during 2020-2030. Many lay people have	Rejected space limitations

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							more trouble interpreting graphs than coloured diagrams like these maps, and the similarity is so striking it would have a bigger impact on those who are turned off by mathematical descriptions than the graphs shown in Figure SPM-4. (George Walker, Aon Re Asia Pacific)	
SPM-705	G-SPM-240	A	5	21	5	31	There is a bit of a logical disconnect here, with the preceding paragraphs noting the increase in concentration since 1750, but these paragraphs referring to temperature changes since the mid-20th century. Incorporation of the statement from from Topic 2 page 3 lines 25-27, on recent CO2 concentration growth-rates, into the preceding paragraphs may help. (Government of New Zealand)	Rejected, headline statements refer to following text.
SPM-706	G-SPM-241	A	5	21	5	31	Incorporation of a brief note about feedbacks (from Section 2.3) would be useful here. It should include mention of water vapour effects, clouds, carbon cycle feedback, and the fact that spatial patterns of climate response are largely controlled by climate processes and feedbacks. (Government of New Zealand)	Rejected space limitations
SPM-707	E-SPM-427	A	5	22			Add brackets after anthropogenic (due to human activities) (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Rejected space limitations
SPM-708	E-SPM-428	A	5	23	5	24	The sentence "It is likely that ... except Antarctica" is ambiguous, in that the reader does not know whether it means that it is likely that there has not been significant anthropogenic warming over Antarctica or that we simply do not have the observational and modelling basis for expressing a likelihood. Would it be better to change "except Antarctica" to "with the possible exception of Antarctica"? (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Accepted. Footnote inserted
SPM-709	E-SPM-429	A	5	23	5	24	The last sentence of the paragraph can be easily confusing for people who do not focus on the word anthropogenic while reading it. A quick glance at the sentence seems to contradict the first statement of the summary. I would suggest deleting it or moving it down and using the first sentence from the next paragraph as part of the bolded statement. I am assuming that this summary is for non-technical people. (Katherine Casey Delhotal, RTI International)	Rejected
SPM-710	E-SPM-430	A	5	23	5	24	The "likely" in this statement sounds like it applies to the combination of significant anthropogenic warming over the six inhabited continents AND the lack of it over Antarctica. In fact it should only apply to the warming over the six inhabited continents. While no one has shown that there is a significant anthropogenic warming over Antarctica, no one has shown that there is not either, so we simply do not have the observations and/or research to back a statement that it is likely that there has been no significant anthropogenic warming there. Changing to "...continent, except Antarctica" (i.e. simply inserting a comma) may be enough to clarify this.	Accepted, footnote inserted.

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							(Dáithí Stone, University of Oxford)	
SPM-711	E-SPM-431	A	5	23	5	24	Come now, how can this be only likely (or perhaps this is because there is some minimum associated with "significant"--to what is never defined)? Global CO2 has increased and this has clearly exerted a very strong warming influence everywhere--now, it may be that there are some other influences in some places, but there has been a human-induced warming influence everywhere, and it is evident in most regions. (Michael MacCracken, Climate Institute)	Rejected
SPM-712	E-SPM-432	A	5	23	5	24	An important clarification is necessary here. Does this sentence mean that significant anthropogenic warming has not been observed in Antarctica, or that insufficient observations are available to determine whether significant anthropogenic warming has occurred in Antarctica? This sentence can be read either way, and the meaning is quite different. (Michael Mastrandrea, Stanford University)	Accepted, footnote inserted.
SPM-713	E-SPM-433	A	5	23	5	24	According to my intuition, Antarctica should show the most significant anthropogenic warming effect since it is so cold there. (Tiejun Ma, International Institute for Applied Systems Analysis)	Rejected
SPM-714	G-SPM-242	A	5	23	5	24	The statement and the cited figure gives an impression that it contains information on Antarctica but the figure does not show any thing about Antarctica (Government of India)	Accepted, footnote inserted.
SPM-715	G-SPM-243	A	5	23	5	31	Given the difference in likelihood of the 1st and 2nd bold sentences, move it into the supporting paragraph, just before the "However" (line 30) - that way the two sub-global can be juxtaposed. (Government of United States)	Rejected. Structure of this attribution headline and paragraph follows that for attribution of effects at the end of this topic.
SPM-716	E-SPM-434	A	5	24	5	24	To be consistent with Topic 2, either in the text or as a footnote, the SPM should point out that no judgment can be made about Antarctica because of lack of data. (Robert Siveter, IPIECA)	Accepted, footnote inserted.
SPM-717	E-SPM-435	A	5	24	5	24	except Antartica. I don't understand the reason of this exception, but observations or models conclusions I don't know. (Annick Douguédroit, Université de Provence)	Accepted, footnote inserted.
SPM-718	G-SPM-244	A	5	24	5	24	To be consistent with Topic 2, either in the text or as a footnote, the SPM should point out that no judgment can be made about Antarctica because of lack of data. (Government of United States)	Accepted, footnote inserted.
SPM-719	G-SPM-22	C	5	24	5	24	" Could state that Antarctica is not included due to lack of observations (footnote)" (Government of Belgium)	Accepted, footnote inserted.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-720	E-SPM-436	A	5	24			Again, this continent-wide statement hides the existence of very strong and significant trends in parts of the continent (Peter Convey, British Antarctic Survey)	Rejected. Not consistent with Plenary approved text and WGI SPM
SPM-721	G-SPM-246	A	5	26	5	26	Define the term "external forcing" (Government of United States)	Text revised
SPM-722	G-SPM-23	C	5	26	5	26	replace '... temperature change...' by '...temperature increase...'. (Government of Belgium)	Text revised
SPM-723	E-SPM-437	A	5	26	5	27	The term "external forcing" is jargon--has not been defined. Replace it with "a dominant anthropogenic influence" or something similar. (Michael MacCracken, Climate Institute)	Text revised
SPM-724	E-SPM-438	A	5	26	5	27	The global temperature increases in the "surface record can be explained by inaccuracies in the procedure by which it is compiled and by addition of El Niño to ther "natural" effects (Vincent Gray, None)	Rejected. Plenary approved text
SPM-725	E-SPM-440	A	5	26	5	27	please replace "without external forcing" by "without anthropogenic forcing" to avoid misinterpretations "external forcing" is mis-leading for non-climate scientists (Markus Erhard, European Environment Agency)	Text revised
SPM-726	E-SPM-441	A	5	26	5	27	Oceaniac circulation may vary on multi-decadal scales. Would is it good to change the sentence to "It is unlikely that the global temperature change of the past fifty years can be"?? (Guoyu Ren, National Climate Center)	Text revised
SPM-727	E-SPM-439	A	5	26	5	28	The correct emphasis on the extreme unlikelihood of global warming without external forcing requires further boldface emphasis. The data suggest that sum solar & volcanic activity would likely lead to cooling--not warming--should also receive boldface emphasis. (Peter Liotta, Pell Center for International Relations and Public Policy)	Text revised
SPM-728	E-SPM-442	A	5	26	5	28	delete the first two sentences in this paragraph. I suggest you concentrate in FigureSPM-4 for the "Science" part. (Hugo Beltrami, St. Francis Xavier University)	Text revised
SPM-729	G-SPM-245	A	5	26	5	28	This paragraph could more clearly make the following points 1) that the warming trend can only be explained by a change in external forcing and not internal climate variability, 2) that the natural external forcings have exerted a cooling effect over this time period, and therefore anthropogenic forcing is implicated. Suggest adding to line 27 the WORDS IN CAPS in the following:"without external forcing (I.E. CANNOT BE EXPLAINED BY INTERNAL CLIMATE VARIABILITY)" Also suggest adding the word "Furthermore" to the beginning of the sentence 2 to make clear that sentence 2 builds on sentence one. (Government of Canada)	Text revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-730	E-SPM-444	A	5	27	5	27	I am not sure the meaning of the phrase 'external forcing' will be clear to readers. External to what? (Noel Gurwick, Carnegie Institution)	Text revised
SPM-731	E-SPM-448	A	5	27	5	27	..external forcing: scientific expression incomprehensible for policymakers. In the glossary? I think that the least the glossary is needed, the best it is. So replace external forcing in the text by non-natural forcing? Or may better by human-induced forcing: it will be clearer to understand lines 29-30 where anthropogenic would be replaced by human_induced. External=human-induced. (Annick Douguédroit, Université de Provence)	Text revised
SPM-732	G-SPM-248	A	5	27	5	27	The authors have not at this point explained the concept of forcings, as such a footnote should be included explaining what an "external forcing" is. (Government of Australia)	Text revised
SPM-733	E-SPM-443	A	5	27	5	31	This text is only clear if one goes to the glossary to sort out exactly what 'external' means and then infers what is meant by 'natural'. Rewrite lines 27 through 31 as follows: ' explained without external anthropogenic forcing. During this time, the sum of external solar and volcanic forcings would be likely to have produced cooling, not warming. The observed patterns of warming and their changes over time are simulated only by models that include all three external forcings. However, difficulties remain in reliably simulating and attributing observed temperature changes to these external forcings at smaller than continental scales. {2.4} (Steven Clemens, Brown University)	Text revised
SPM-734	E-SPM-445	A	5	27			Explain what is meant with 'external forcing'. Apparently this means 'anthropogenic forcing', but since the reader is not aware of what are considered internal variables in the system, confusion is possible. (Marcel Marchand, Delft Hydraulics)	Text revised
SPM-735	E-SPM-446	A	5	27			Consider adding footnote (or bracketed text) to provide definition of external forcing - it is not intuitive. (Donald Lemmen, Natural Resources Canada)	Text revised
SPM-736	E-SPM-447	A	5	27			Clarify "external forcing" in Summary for policy makers. (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Text revised
SPM-737	E-SPM-449	A	5	27			"external" is not an especially well-defined term. To some it might mean forcing coming from outside the Earth. "anthropogenic" might be better. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text revised
SPM-738	E-SPM-450	A	5	27			"During this time, the sum of solar and volcanic forcings would be likely to have produced cooling, not warming". We have to qualify this by referring to Figure SPM-4. (Ben Muirheid, International Fertilizer Trade Association (IFA))	Rejected. Plenary approved text.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-739	G-SPM-247	A	5	27			We propose that "external" is substituted by "antropogenic". (Government of Norway)	Text revised
SPM-740	G-SPM-249	A	5	27			Suggest replace "without external forcing" by "GHG warming " or "by natural variability" (Government of Ireland)	Text revised
SPM-741	E-SPM-454	A	5	28	5	29	"The observed patterns of warming and their changes" Additional explanation would help to show GhG impact on global warming: tmp increase in lower troposphere, cooling in stratosphere, most increase in night temperatures more than day temperatures should be clearly communicated and attributed as impact of GhG increase on global climate system. (Markus Erhard, European Environment Agency)	Rejected space limitations
SPM-742	E-SPM-451	A	5	28	5	30	The observed...forcings. But since the 70's only human-induced forcing corresponds with warming (see SPM-4). Can such a sentence be added line 30 ? (Annick Douguédroit, Université de Provence)	Rejected Plenary approved text
SPM-743	G-SPM-250	A	5	28	5	31	These last two sentences on the page (starting "The observed patterns ...") are of limited usefulness to policymakers and could be omitted. (Government of New Zealand)	Rejected. Important for explaining attribution methods
SPM-744	E-SPM-452	A	5	28			Change "would be likely to have" to "likely have". (Katsumi Matsumoto, University of Minnesota)	Accepted, grammatical change only.
SPM-745	E-SPM-453	A	5	28			be likely to --> "likely" (Rolf Mueller, Research Centre Juelich)	Accepted, grammatical change only.
SPM-746	G-SPM-251	A	5	28			The sentence "The observed patterns of warming and their changes over time are simulated only by models that include both natural and anthropogenic forcings." might be difficult to understand, and we propose the following rewriting: "Climate models show that the observed patterns of warming and their changes over time only can be explained by a combination of both natural and anthropogenic forcings." (Government of Norway)	Rejected Plenary approved text
SPM-747	E-SPM-455	A	5	29	5	29	I would suggest changing "are simulated" to "can be simulated" (Michael MacCracken, Climate Institute)	Rejected Plenary approved text
SPM-748	E-SPM-456	A	5	29	5	29	for 'are simulated only by' write 'require'. (John R. Porter, University of Copenhagen)	Rejected Plenary approved text
SPM-749	G-SPM-252	A	5	29	5	29	To improve the meaning of the sentence we suggest to substitute the word "simulated" with "matched" and "models" by "model simulations" so the sentence reads : "are matched only by model simulations....." (Government of Norway)	Rejected Plenary approved text

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SPM-750	E-SPM-457	A	5	30	5	31	This sound in my view too much like an understatement given that figure SPM-4 follows. Why not stating that progress was made on this since TAR that allows to demonstrate the anthropogenic dominance in regional warming signals, yet that uncertainties remain. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected Plenary approved text
SPM-751	E-SPM-460	A	5	31	5	31	Again, "external forcings" has not been defined--replace with "anthropogenic influences". This sentence is also making a rather technical mathematical point, but in such a way that it is likely to be misleading to typical policymakers. The mathematical point is that we cannot do the statistics adequately for a number of reasons, but this phrasing could come across as implying that there is no human-induced effect at smaller than continental scales, which would be a very wrong impression to convey. every region is being affected by the large-scale average for the region--one cannot have a region that is not being affected. What we cannot say reliably is if the change at smaller than continental scales is larger or smaller than the continental scale average value. (Michael MacCracken, Climate Institute)	Text revised
SPM-752	G-SPM-253	A	5	31	5	31	use of "smaller" in this sentence makes it unclear. "smaller" may be replaced by "regional and local" or just "regional", as appropriate. (Government of India)	Rejected Plenary approved text
SPM-753	E-SPM-459	A	5	31	5	32	I see potential for someone to take the first clause out of context (by leaving out the information about scales) to suggest that the report expresses doubt where it actually does not. I suggest rewording to limit this potential. (Noel Gurwick, Carnegie Institution)	Rejected Plenary approved text
SPM-754	E-SPM-458	A	5	31			See comment immediately above with regard to the word "external". [TSU ote: See comment E-SPM-449-A] (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text revised
SPM-755	G-SPM-254	A	5	31			reason for these difficulties could be provided e.g. scale, resolution and natural variability (Government of Ireland)	Rejected space limitations
SPM-756	G-SPM-16	B	5	31			Please add "due to the relatively large natural variability of climate at the local scale" (Government of United Kingdom)	Rejected space limitations
SPM-757	E-SPM-461	A	5				In graph c), meaning of the numbers 1) to 7) is not clear. (Toshihiko Masui, National Institute for Environmental Studies)	Accepted and corrected
SPM-758	E-SPM-462	A	5				In Figure SPM-3 (c) lack the Notes relate with numbers from (1) to (7) (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Accepted and corrected
SPM-759	E-SPM-463	A	5				Figure SPM-3a: As far as one can see in SPM-3a from 1980 to 2004 there have been no or very small increases in emissions from N2O, deforestation and CH4 - ie the size of these parts of the columns hardly changes - in contrast to the CO2 from fossil fuel use.Later (P5, lines 15-	Noted

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							16) reference is made to increases in methane and nitrous oxide but these are hardly evident in SPM-3. (John R. Porter, University of Copenhagen)	
SPM-760	E-SPM-464	A	5				Figure SPM-3: This figure does not present trend values. Hence I would change "greenhouse gas emission trends" to "greenhouse gas emissions" in line 1 and "greenhouse gas trends" to "greenhouse gases" in line 3. (Claire Parkinson, NASA Goddard Space Flight Center)	Accepted
SPM-761	E-SPM-465	A	5				Figure SPM-3: Policymakers have practical minds; they should be interested by conclusions of the IPCC WG III Summary for policymakers, last paragraph of page 3 and beginning of page 4 on energy sector growth. There is room for a fourth small figure on page 5 (SPM-3) synthesizing energy increases (in average, direct and indirect increase as mentioned in WGII summary) (Annick Douguédroit, Université de Provence)	Rejected space limitations
SPM-762	E-SPM-466	A	5				Figure SPM-3: This graph does not show 'trends'. Suggest changing title to 'Global anthropogenic greenhouse gas emissions'. Suggest changing caption to: 'Figure SPM-3. (a) Global anthropogenic greenhouse gas annual emissions, 1970 to 2004 (F-gases accounting for around 1% excluded from this figure). (b) Percentage contributions of different anthropogenic greenhouse gases to total greenhouse gas emissions in 2004. (c) Contribution of different sectors to total anthropogenic greenhouse gas emissions in 2004. {Figure 2.1}' (David Fahey, NOAA Earth Science Research Laboratory)	Accepted
SPM-763	E-SPM-467	A	5				Figure SPM-3. The term 'F-gases' does not appear to be defined anywhere including the Glossary. (George Walker, Aon Re Asia Pacific)	Glossary
SPM-764	E-SPM-468	A	5				Figure SPM-3. I suggest indicating that other gases, such as ozone and halocarbons (even if emissions are small) also contribute to warming, if only in the legend. See comment above on Fig 2.4. (Knute Nadelhoffer, University of Michigan)	Rejected Plenary approved figure
SPM-765	E-SPM-469	A	5				Figure SPM-3, panels (b) and (c), please use decimal points instead of commas. Possibly also remove the references to notes 1-7 in panel (c). (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Accepted
SPM-766	E-SPM-470	A	5				Figure SPM-3 c). It is very difficult to understand for people that forestry generate greenhouse gases emissions. The other sectors are normally gases emissors but not "forestry". I think it is necessary a explanation that means forestry and that activities are emissors for to understand figure c) (Dionisio Rodriguez Alvarez, Xunta de Galicia)	Forestry includes deforestation

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-767	E-SPM-471	A	5				Figure SPM-3 c) what are 1) 2) 3) etc. . Written near sectors name ? (Stefano Caserini, Politecnico di Milano)	Corrected
SPM-768	E-SPM-472	A	5				Figure SPM-3 (c). The explanatory text has numbers in superscript - what are they? (Kenneth Möllersten, Swedish Energy Agency)	Corrected
SPM-769	E-SPM-473	A	5				Fig. SPM-3: '... greenhouse gases in 2004 with a 100 year time horizon for the applied global warming potential' (Manfred Treber, Germanwatch)	Caption revised
SPM-770	E-SPM-474	A	5				Fig. SPM-3, part (c): What are footnotes? Need to remove footnote numbers or include the footnotes. (Alan Robock, Rutgers University)	Corrected
SPM-771	E-SPM-475	A	5				Fig SPM3 (a). Where does CO2 from cement manufacture fit in on this diagram, or is it negligible compared to the terms shown? (Nathan Gillett, University of East Anglia)	Caption amended, it is part of the bars for fossil fuel.
SPM-772	G-SPM-255	A	5				The Figure SPM-3 c has superscripts which are not explained. They should have explanations or they must be removed. (Government of Finland)	Corrected
SPM-773	G-SPM-256	A	5				Figure SPM-3: Show information on absolute figures e.g. in a table (for sectoral as well as for global emissions of CO2 and other GHG as well as for total GHG emissions. This is information that is often asked for by policymakers and that is very hard to find in WG reports. Also, figures in WG I and WG III are partly contradictory and not consistent, e.g. when trying to put together the figures for emissions from deforestation and comparing them to total emissions. A good overview table would be useful. (Government of Germany)	Rejected space limitations
SPM-774	G-SPM-257	A	5				Figure SPM-3 comment: This is a useful figure, which we believe should be retained. (Government of New Zealand)	Noted
SPM-775	G-SPM-258	A	5				Figure SPM3 c): There are not Notes related with the small numbers from (1) to (7) (Government of Cuba)	Corrected
SPM-776	G-SPM-259	A	5				Figure SPM-3 (c): The references for "1)"-"7)" are not mentioned in the caption. Please delete these numbers or add the explanations. (Government of Japan)	Corrected
SPM-777	G-SPM-17	B	5				Please add diagram show the rise in GHG concentrations – perhaps in terms of CO2 equivalence for space reasons? (Government of United Kingdom)	Rejected space limitations

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-778	G-SPM-260	A	6	1	6	2	SPM-4 A small legend should be included similar to that done in WGI SPM-4 denoting the meaning of the different coloured lines/bands in the graph. While these coloured representations are explained in text below SPM-4 it would be helpful for policy makers to have this information summarized in a small 'legend' within the graphical area rather than such extensive explanatory text. This use of a legend will also save some space as the corresponding explanation could be deleted from the caption. (Government of Canada)	Accepted
SPM-779	G-SPM-262	A	6	1	6	2	Add temperature data graph for Antarctica. (Government of United States)	Footnote added
SPM-780	E-SPM-476	A	6	1	6	4	This is a statistician talking to a statistician--not a policymaker. Remember who the audience is and to talk in terms they can understand. This phrasing is like saying "it is very likely that the observed changes in cure rates for cancer cannot be explained entirely due to natural causes or other factors than the medical treatments being given." In the SPM, speak using the perspective of your listeners--that is what this document is for. So, say "it is very likely that human influences on the climate are a major factor in causing the observed changes in physical and biological systems." (Michael MacCracken, Climate Institute)	Rejected Plenary approved text
SPM-781	E-SPM-477	A	6	1	6	9	delete lines (Hugo Beltrami, St. Francis Xavier University)	Rejected, no justification
SPM-782	E-SPM-478	A	6	1	6	9	Concerns expressed in Comment 1 above here are further magnified. Relative and in some cases actual GDPs have markedly declined in sub-Saharan Africa (and parts of South America) yet all regional illustrations show temperature rises for all regions. Relative impact of GDP on climate change is made further unclear. (Peter Liotta, Pell Center for International Relations and Public Policy)	Rejected, space limitations
SPM-783	G-SPM-261	A	6	1	6	9	Perhaps the decrease during 1940-1970 should be explained. It often raises questions. (Government of Sweden)	Rejected, space limitations
SPM-2133	E-SPM-5	D	6	1			Again some comment that temperatures have declined in the mid-20th century particularly in the northern hemisphere, with differences between North America and Europe. (Stephen Hawkins, Marine Biological Association of the UK)	Rejected, space limitations
SPM-784	E-SPM-479	A	6	3	6	3	The graphs for North America and Asia are in complete contrast to those published for the USA by NOAA and for China by the Beijing Climate Center, both of whom show no significant warming for the last 100 years. (Vincent Gray, None)	Rejected plenary approved figure
SPM-785	E-SPM-480	A	6	4	6	4	The legend needs to be clearer: suggest 'simulated by climate models that use either natural or natural plus anthropogenic forcings.' The rest of the legend should be omitted but with a reference to the relevant WG report and section.	Accepted; remainder of legend kept because it provides important further explanation to make the

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							(John R. Porter, University of Copenhagen)	figure understandable.
SPM-786	E-SPM-481	A	6	6			for the <period> 1901-1950 (Michel Rixen, NATO Undersea Research Center)	Accepted
SPM-787	E-SPM-482	A	6	7			"Blue shaded bands show variations that account 5-95% of the range predicted by the models." (Kenichi Matsuoka, University of Washington)	Rejected, plenary approved text
SPM-788	E-SPM-483	A	6	10			is it possible to list all the significant feedbacks?? This is important enough, in my view, to take up a wee bit of space. (Herman Sievering, University of Colorado)	Rejected, space limitations
SPM-789	E-SPM-484	A	6	12	6	12	Discernable human influences: the expression is confusing. It is the warming which influences other aspects of climate. They are secondary (indirect) effects of warming. Replace by "Warming influences also other aspects of climate" (Annick Douguédroit, Université de Provence)	Rejected, plenary approved text
SPM-790	E-SPM-485	A	6	12	6	12	As I noted earlier, it's odd that this sentence comes here when a number of effects of climate change other than warming have already been identified (pages 3-4). It makes for an odd transition and seriously interferes with readability. It is almost as though a reader would need to restructure the entire document in order to then be able to read it through in a way that flows and makes sense. (Noel Gurwick, Carnegie Institution)	Rejected, this is about attribution, not observed changes
SPM-791	G-SPM-264	A	6	12	6	12	We propose to replace "discernible" by "noticeable" to make the text more understandable for non-native readers. (Government of Norway)	Rejected, plenary approved text
SPM-792	G-SPM-263	A	6	12	6	28	We suggest to delete lines 12 to 28, which add no valuable information for the policymakers, as these changes are discussed before. (Government of France)	Rejected, this is about attribution, not observed changes
SPM-793	G-SPM-265	A	6	12	7	9	Although the distinction between 'observed changes' and 'observed changes that can be attributed to human influences' is important to science, it is less important to policymakers, or is important for rather different reasons. The impression is given to the policymaker of substantial repetition and wastefulness. Where possible the two lots of information should be combined and the space saved used to draw out the relevance of the attribution for policymakers. (Government of New Zealand)	Rejected. This is policy relevant
SPM-794	E-SPM-486	A	6	14	6	21	There may be need to include a reference to the specific working group reports on the bulleted points, where readers may get the details	Details in underlying SyR text; SPM only refers to longer SYR

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							(Richard Anyah, Rutgers University)	report.
SPM-795	E-SPM-487	A	6	14	6	21	Refer to the very likely impact of "sea level rise and coastal erosion". (Magdalena Muir, Environmental and Legal Services Ltd.)	Rejected this is about attribution of observed climate change not projected impacts.
SPM-796	E-SPM-488	A	6	14	6	21	Consider adding increases in intense tropical cyclone activity to this list as described in WGI (more likely than not). (Michael Mastrandrea, Stanford University)	Rejected space limitations.
SPM-797	E-SPM-489	A	6	15	6	15	Come now--we know humans warmed the global climate and this melted glaciers and caused heat uptake by the oceans--there is no doubt that human activities contributed to sea level rise--there is no other possibility. Maybe not all the rise, but they certainly contributed. (Michael MacCracken, Climate Institute)	Rejected plenary approved text.
SPM-798	G-SPM-267	A	6	15	6	21	The bullet on line 21 has no confidence level. Ensure that likelihood/uncertainty statements are used in all necessary places and consistently throughout the document. (Government of United States)	Accepted. Text deleted
SPM-799	G-SPM-268	A	6	15	6	21	Given that there had been significant anthropogenic warming over the past 50 years, isn't it confusing to list only a limited amount of impacts due to human influence on other aspects of climate? (Government of European Community)	Rejected, these are attributable impacts
SPM-800	G-SPM-266	A	6	15			This strong statement does appear only appended to a table footnote in the SPM of WGI (SPM for WGI, page 8, table SPM.2)! (Government of Kingdom of Saudi Arabia)	Rejected, based on bold headline in TS text from WGI. Table SPM-2 is extremes table, not about mean sea level rise.
SPM-801	E-SPM-490	A	6	16	6	17	suggest that likely contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns be changed in to likely contributed to changes in wind patterns, precipitation and temperature patterns as well as poleward shift of extra-tropical storm tracks, Taking in account the following conclusions in page 9 line 22, Poleward shift of extra-tropical storm tracks with consequent changes in wind, precipitation, and temperature patterns. (Bangzhong Wang, China Meterological Administration)	Rejected, Plenary approved text.
SPM-802	G-SPM-270	A	6	16	6	17	Can you justify this statement ? Can you compare observed and projected values? (Government of France)	Yes; more detailed comparison not possible in SPM due to space limitations; see topic 2.
SPM-803	G-SPM-269	A	6	16			The term "extra-tropical" should be explained. (Government of Norway)	Rejected

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SPM-804	E-SPM-491	A	6	17	6	17	I found this sentence confusing. One could either read it as wind patterns affect storm tracks and temperature patterns (presumably this is supposed to be how it is read), or human influence contributed to changes in wind patterns, storm tracks and temperature patterns. I suggest replacing the second part of the sentence with 'which have affected extratropical storm tracks and regional temperature patterns.' This still leaves the question of whether the storm tracks drive the wind pattern changes or vice versa, which I think is debatable - the authors may wish to change the text to reflect this. (Nathan Gillett, University of East Anglia)	Rejected Plenary approved text.
SPM-805	E-SPM-494	A	6	18	6	18	Replace "...hot nights, cold nights and cold days ..." by "...warm nights, cool nights and cool days" (Serhat Sensoy, Turkish State Meteorological Service)	Rejected plenary approved text.
SPM-806	G-SPM-271	A	6	18	6	20	In the two bullets, what is the reason for downscaling by one step the confidence value in the attribution as compared with the confidence value in the observed values reported on page 1 ? (Government of France)	Rejected plenary approved text.
SPM-807	E-SPM-492	A	6	18			The bullet on temperature extremes is a bit different from the WGI SPM extremes table, although I am fine with this wording. I suggest to replace most extreme hot nights with warmest nights. (Gabriele Hegerl, Duke University)	Rejected plenary approved text.
SPM-808	E-SPM-493	A	6	18			should be "decreased cold nights and cold days" (Xiuqi Fang, Beijing Normal University)	Rejected plenary approved text.
SPM-809	E-SPM-495	A	6	18			I think "hot days" should be added here. (Sabine Wurzler, North Rhine Westphalia State Agency for Nature, Environment and Consumer Protection)	Rejected plenary approved text.
SPM-810	E-SPM-498	A	6	19	6	19	deleting "and the area affected by drought", because it is hard to say by human influence. (Zong-Ci Zhao, China Meteorological Administration)	Rejected plenary approved text.
SPM-811	E-SPM-497	A	6	19	6	20	here there is a discussion about the "risk of heat waves" on page 1, there is a discussion about the "frequency" of heat waves. I do not believe the two statements are consistent. (Rolf Mueller, Research Centre Juelich)	Rejected plenary approved text.
SPM-812	E-SPM-496	A	6	19			Use the word "likely" instead of "more likely than not". (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Rejected plenary approved text.
SPM-813	E-SPM-499	A	6	19			"increased the risk of heat waves and the area affected by drought" should be followed by "and reduced the risk of cold waves, unseasonal killing frosts, and increased precipitation in broad areas." (John Everett, Ocean Associates, Inc.)	Rejected plenary approved text.

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SPM-814	E-SPM-500	A	6	21	6	21	This statement is very weak and unquantified compared with the 4 previous points (Michael Manton, Monash University)	Accepted, text deleted
SPM-815	E-SPM-501	A	6	21	6	21	There is no confidence level attributed to this statement. It seems not to be included in WGI SPM. (Serge Planton, Météo-France)	Accepted, text deleted
SPM-816	E-SPM-503	A	6	21	6	21	deleting this point, because it is hard to say by human influences. (Zong-Ci Zhao, China Meteorological Administration)	Accepted, text deleted
SPM-817	E-SPM-506	A	6	21	6	21	"exerted some influence" is a bit wishy-washy. How about "exerted a detectable influence"? (Richard Allan, University of Reading)	Accepted, text deleted
SPM-818	G-SPM-273	A	6	21	6	21	Please explain "some" or delete. (Government of United States)	Accepted, text deleted
SPM-819	G-SPM-274	A	6	21	6	21	For consistency this bullet point should include a likelihood finding. (Government of Australia)	Accepted, text deleted
SPM-820	E-SPM-502	A	6	21			The bullet on land precipitation could use a likelyhood statement. The level depends on the literature cutoff date, if with WGISPM, probably a very weak one. In present phrasing, it sounds almost certain. (Gabriele Hegerl, Duke University)	Accepted, text deleted
SPM-821	E-SPM-504	A	6	21			Add liklihood statement for consistency with other statements (Donald Lemmen, Natural Resources Canada)	Accepted, text deleted
SPM-822	E-SPM-505	A	6	21			...land (?) precipitation... (Monica Beatriz Wehbe, National University Rio Cuarto)	Accepted, text deleted
SPM-823	G-SPM-272	A	6	21			the likelihood of the statement "exerted ... 20th century" is not assessed. (Government of Kingdom of Saudi Arabia)	Accepted, text deleted
SPM-824	E-SPM-507	A	6	22	6	22	Add a bullet: INCREASES IN OCEAN WATER TEMPERATURES(WITH INFLUENCES OVER HURRICANE INTENSITY INCREASES) (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Rejected space limitations; change in regional SSTs has not been formally attributed to anthropogenic influence
SPM-825	G-SPM-275	A	6	22			Add another reference as follows: • increased water temperatures of oceans, with influence over the intensity of hurricane in North-Atlantic area. (Government of Cuba)	Rejected space limitations; change in regional SSTs has not been formally attributed to anthropogenic influence
SPM-826	E-SPM-510	A	6	23	6	23	I would strong suggest using "human-induced" instead of anthropogenic. If I was giving a presentation to the US congress, I would not use the word anthropogenic in fear it would be	Rejected planary approved text

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							unclear to them. (Katherine Casey Delhotal, RTI International)	
SPM-827	E-SPM-508	A	6	23	6	24	It would be useful to refer to high degree of observed changes in coastal ecosystems, which are the interface between the land and the ocean. The coasts are a zone of significant observed changes, particularly in the Arctic, along the the Baltic and North Sea, and southern Europe (the south Atlantic, and the Mediterranean Sea). (Magdalena Muir, Environmental and Legal Services Ltd.)	Rejected space limitations
SPM-828	E-SPM-509	A	6	23	6	24	I'm not sure how this is different from the previous boldface sentence and the bullets underneath it. In fact, it seems like this section might weaken it. Somehow the two need to be reconciled or clarified. (Noel Gurwick, Carnegie Institution)	This section is about attribution of responses in natural systems
SPM-829	G-SPM-277	A	6	23	6	25	Please replace this bolded chapeau with the exact language from the WG2 SPM. (Government of United States)	We note the difference between this statement and the WGII statement but these words have been carefully drafted after deliberations between WGI and WGII authors in order to provide a carefull synthetic statement that more fully reflects the assessments of both WGI and WGII reports.
SPM-830	E-SPM-511	A	6	23	6	28	delete lines (Hugo Beltrami, St. Francis Xavier University)	Rejected, no justification
SPM-831	G-SPM-276	A	6	23	7	4	The arguments underpinning this statement in the SPM WG II were more clear and less confusing. Please correct or delete. The number of studies is not necessarily a good indicator of the confidence one can have in their results, for instance if the "few studies" are carefully review meta-analyses of many other studies. The conclusion in the WG II SPM is very different from the tone in this SYR statement. The following sentence from the WG II SPM p. 4 should be added for balance: "Nevertheless, the consistency between observed and modelled changes in several studies and the spatial agreement between significant regional warming and consistent impacts at the global scale is sufficient to conclude with high confidence that anthropogenic warming over the last three decades has had a discernible influence on many physical and biological systems." (Government of European Community)	Text revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-832	G-SPM-278	A	6	24			the sentence "observed changes" is not in the SPM of WGII version (SPM for WGII, page 3). (Government of Kingdom of Saudi Arabia)	We note the difference between this statement and the WGII statement but these words have been carefully drafted after deliberations between WGI and WGII authors in order to provide a careful synthetic statement that more fully reflects the assessments of both WGI and WGII reports.
SPM-833	E-SPM-512	A	6	26	7	4	text could be deleted - inconsistent with approach for all other section to state "This assessment is based on:" (Donald Lemmen, Natural Resources Canada)	Text revised
SPM-834	G-SPM-279	A	6	26	7	4	Agree that the bullets capture the two most relevant lines of evidence in support of the bolded statement; however, recommend pulling the exact language for these lines of evidence (3 and 4) from the WG2 SPM text. (Government of United States)	Text revised
SPM-835	E-SPM-513	A	6	27	6	27	The word "small" here is too subjective, and I think there may be different decision from person to person whether the existed studies should be represented as "numbers of" ones or "small numbers of" ones, or even "limited numbers of" ones. I, therefore, think it better here to write down actual number of "studies," counted by WGII authors to lead them a words of "small numbers." (Tsuneo Ono, Hokkaido National Fisheries Research Institute, Fisheries Research Agency)	Text revised
SPM-836	E-SPM-514	A	6	27	6	27	Suggest rewording to "an increasing number of studies have linked"--"small" is undefined, and the number is growing rapidly. (Michael MacCracken, Climate Institute)	Text revised
SPM-837	G-SPM-280	A	6	28	6	28	What is the meaning of "directly" ? How are identified anthropogenic climate change, as opposed to observed climate change ? (Government of France)	Text revised
SPM-838	E-SPM-515	A	6	28			...linked to anthropogenic climate change - is this an indirect attribution statement, or are there a few studies linking the changes to anthropogenic forcing directly? (Gabriele Hegerl, Duke University)	There are direct attribution studies of effects
SPM-839	E-SPM-516	A	6				Figure SPM-4: May need to extrapolate results beyond 2000 to see the effects with the current rate of natural and anthropogenic forcings as in Topic 3. (Ben Muirheid, International Fertilizer Trade Association (IFA))	Rejected Plenary approved figure.

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SPM-840	E-SPM-517	A	6				Figure SPM-4. This is an excellent figure that shows clearly and simply the difference between anthropogenic forcing and natural forcing. (John R. Porter, University of Copenhagen)	Noted
SPM-841	E-SPM-518	A	6				Figure SPM-4 caption. Include reason for omission of Antarctica graph (or it looks like you are deliberately omitting the only place not to show warming). (Joanna Haigh, Imperial College)	Accepted footnote added
SPM-842	G-SPM-281	A	6				For completeness Antarctica should be included in this figure. (Government of Norway)	Footnote added
SPM-843	G-SPM-282	A	6				Figure SPM-4 comment: While interesting to the scientist, this figure is not really useful to a policymaker and should be omitted to simplify the SPM and to save space. (Government of New Zealand)	Rejected.
SPM-844	G-SPM-283	A	6				Fig SPM-4. Readers printing text without colors can not see what is blue/red. (Government of Norway)	Noted; no obvious solution possible.
SPM-845	E-SPM-519	A	7	1	7	4	I have reservations about the statistical methods used in the assessment referred to here, although I haven't seen the latest version of the chapter this is based on to know whether these have been fully addressed. (Nathan Gillett, University of East Anglia)	Noted
SPM-846	G-SPM-284	A	7	1	7	4	This paragraph is awkwardly written. A simpler phrasing is suggested that is still consistent with the text from page 4 of the WGII SPM (Line of evidence #3): "a global-scale assessment of the consistency of observed changes in physical and biological systems with regional warming, which shows that it is very likely that such changes cannot be explained entirely by natural factors." (Government of Canada)	Text revised
SPM-847	G-SPM-285	A	7	1	7	4	the statement is not exactly as the one in SPM of WGII (page 4, point 3). In particular, the statement on page 7 added "or other non-climate factors" which alters the extent of the attribution in the statement. (Government of Kingdom of Saudi Arabia)	Text revised
SPM-848	E-SPM-520	A	7	2			Is very likely consistent with WGII SPM (I don't have it with me as I type this up on an intercontinental flight...)? (Gabriele Hegerl, Duke University)	Yes
SPM-849	E-SPM-522	A	7	3	7	3	"due to"? Why not "entirely by natural"? (Andreas Fischlin, Integrative Biology - Systems Ecology)	Text revised
SPM-850	E-SPM-521	A	7	3			"due" --> "as due" (Rolf Mueller, Research Centre Juelich)	Text revised

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SPM-851	G-SPM-286	A	7	5	7	5	Physical and biological observed impacts mentioned, add a sentence from Technical Summary of WGII, on any literature based conclusion on "Observed Socio-economic Impacts" particularly in developing countries (Government of India)	Rejected space limitations
SPM-852	E-SPM-523	A	7	6	7	9	The last sentence is very awkwardly phrased and the first sentence is not much better. On line 7, change "short time scales of many impact studies" to "the short records of many types of impacts"--it is not the studies that are short time, it is the records. Then rewrite the last sentence to say "As a result, although a linkage is likely, only a few studies have been able to achieve high statistical significance in determining the relative roles of natural and human factors." (Michael MacCracken, Climate Institute)	Text revised
SPM-853	E-SPM-524	A	7	6	7	9	Can some emphasis be put on this statement? (Andy Morse, University of Liverpool)	Rejected; seems clear as is.
SPM-854	G-SPM-287	A	7	6			the caveat on lines 6-9 suggests a weakening of the statement on lines 1-4, i.e. high likelihood but based on little evidence! (Government of Kingdom of Saudi Arabia)	Text revised
SPM-855	E-SPM-525	A	7	7	7	7	insert "currently" before "prevented" (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected, Based on plenary approved text
SPM-856	E-SPM-527	A	7	7	7	7	"greater" than what? (A comparative sentence only makes sense if both items to be compared are given). Sentence should read something like: "...impact studies, greater natural climate variability at a regional compared to the global scale, and possible..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Rejected, Based on plenary approved text
SPM-857	E-SPM-526	A	7	7	7	8	Attribution seems to be an either/or assessment, either you can or you cannot attribute responses to anthropogenic warming. It is the confidence in the attribution that can be higher or lower that appears to be at issue here, given the examples cited. "More complete" should be replaced with a statement about improving confidence: "Increased confidence in the attribution..." Also, "prevented" is a strong word, perhaps "hampered", as it is not clear that nothing more can be said based on current information. (Michael Mastrandrea, Stanford University)	Rejected, Based on plenary approved text
SPM-858	G-SPM-288	A	7	7	7	9	The language is somewhat unclear (what does "more complete" mean?) and too strong ("prevented"). Suggest to rephrase as follows: "More confidence in the attribution of natural system responses to anthropogenic warming is hindered by...". (Government of European Community)	Rejected, Based on plenary approved text
SPM-859	E-SPM-528	A	7	8	7	8	What are 'non-climate factors'? Give example. (John R. Porter, University of Copenhagen)	Rejected space limitations

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SPM-860	E-SPM-529	A	7	8	7	9	This last sentence is capable of leading the readers implicitly to an impression that the observed effects will NEVER be linked to climate model simulations, or ALL of these observed effects are extraneous of the global warming. The fact is that these effects are tentatively indeterminate to be linked with modeled results or not, because of immediate shortness of data numbers or data qualities. So, I suggest to rewrite this sentence as ".....with global climate model simulations are as yet few." (Tsuneo Ono, Hokkaido National Fisheries Research Institute, Fisheries Research Agency)	Rejected, Based on plenary approved text
SPM-861	E-SPM-530	A	7	8	7	9	Delete "Studies that...few." It is more important to link effects to causes than to link them to "model simulations". In any case, this sentence can be eliminated for brevity. (Daniel Murphy, NOAA Earth System Research Laboratory)	Text revised
SPM-862	E-SPM-531	A	7	9	7	10	They may be only few studies, but more relevant and useful would be a statement about the confidence assigned to their findings--quality is more important than quantity. (Michael Mastrandrea, Stanford University)	Text revised
SPM-863	E-SPM-532	A	7	9			"observed effects" => "observed" (Kenichi Matsuoka, University of Washington)	Text revised
SPM-864	G-SPM-18	B	7	9			Does this mean few studies have been done or lots been done but only a few have found the link? If the former then suggest rephrasing this sentence as follows: "Few studies that directly link effects and climate model simulations have been carried out." (Government of United Kingdom)	Text revised
SPM-865	E-SPM-533	A	7	11	7	11	No mention here of economic systems and sectors concerned by warming. !!!!!!! (Annick Douguédroit, Université de Provence)	Rejected, space limitations
SPM-866	E-SPM-535	A	7	12	7	12	impacts: scientific expression incomprehensible for policymakers. Replace it by "effects" which is used in page1, line 5 (Annick Douguédroit, Université de Provence)	Rejected. The word comes from the topics and seems clear.
SPM-867	E-SPM-538	A	7	12	7	12	Add 3 before Climate change... (Annick Douguédroit, Université de Provence)	Accepted.
SPM-868	G-SPM-291	A	7	12	7	13	It may be useful for the reader to know what is considered the "near" and "long" term. Suggest adding at the end of the header "to 2030." (Government of United States)	Heading shortened
SPM-869	E-SPM-536	A	7	12	8	15	Expert Review on Summary for Polycymakers: Climate change and its impacts in the near and long term under different scenarios; Expert Reviewer suggests that "oil and gas crisis" is the most important factor for future social development and emission scenarios. 1) Instability of world oil supply in future has been evaluated by Marion K. Hubbert, Colin J. Campbell and the members of the Association of the Study on Peak Oil and Gas (ASPO). It should be necessary to revise the IPCC Special Report on Emission Scenarios (SRES) using the recent Peak Oil	Rejected. Suggested statement not consistent with the WGIII scenario assessment of the literature.

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							and Gas Scenarios. 2) It should be necessary to insert the following description in this session. "The Peak Oil and Gas Scenarios have been evaluated by the Association of the Study on Peak Oil and Gas (ASPO) and ASPO has predicted that world oil and gas production will peak in around 2010. Therefore the projected IPCC scenarios on CO2 emission and the globally average surface warming (Table SPM-1, 3, 4 and Figure SPM-8) should be revised in near future." (Mitsuru Ando, Toyama University of International Studies)	
SPM-870	E-SPM-537	A	7	12	8	22	delete at these lines. Keep only lines 15-17 and lines 26-29, delete table, and then use Figure SMP_5 to introduce the range of projections. (Hugo Beltrami, St. Francis Xavier University)	The text has been modified. The information on the SRES emission scenarios is important to appreciate the climate changes.
SPM-871	E-SPM-534	A	7	12	13	30	in the part on "Climate change and its impacts in the near and long term under different scenarios" (from p. 7 to p. 13), more attention/emphasis has to be given on the results for near term change and the respective impacts because they are of greatest interest and importance for the policy-makers. (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Noted. Text has been modified.
SPM-872	G-SPM-292	A	7	12	13	30	description of impacts of climate change on infrastructure are missing already in chapter 3. A para on this issue should be added especially as at page 14 lines 9-14 adaptation measure for infrastructure are mentioned. (Government of Germany)	Insufficient space on SPM to describe impacts on specific sectors. Topic 3 contains relevant information.
SPM-873	G-SPM-289	A	7	12			The section about future changes have lost an important finding in WG II SPM about the impacts from future acidification of the oceans. This is a new finding in 4AR and we suggest inclusion of a sentence like this from WG II SPM page 6: "The progressive acidification of oceans due to increasing atmospheric carbon dioxide is expected to have negative impacts on marine shell forming organisms (e.g., corals) and their dependent species." (Government of Norway)	Space limitations prevent this from being added to the SPM.
SPM-874	G-SPM-290	A	7	12			Section "Climate Change and its impacts in the near and long term under different scenarios". This is a very important section that has very useful information. However, it could be improved considerably by enhancing the synthesis-character of this section and integrating more of the relevant information from the WG reports, in particular focussing on giving information to policymakers from the point of view of risk assessment and risk management under uncertainty. This means that information on potential impacts with large or large-scale damages involved should be included, even if they cannot be assessed with high confidence or if the likelihood is estimated low or if the impacts would occur beyond 2100. In particular, information on large-scale events or potential abrupt, non-linear changes is not included in enough detail. Please include information from WG I	Topic 5 discusses the risks associated with climate change. The lack of information in the underlying reports hinders the assessment of risk of the events noted in the comment.

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							and in particular WG II (in particular Chapter 19) on the following risks, including relationship to global mean temperature, as this is highly policy relevant: risks from positive feedbacks leading to accelerated release of GHG (Methane release from wetlands and permafrost melt and methane release of marine hydrates, CO2 from biosphere), risk of ice-sheet desintegration (both Greenland and Antarctica). Information should be given even if not included in SPMs of WG reports, as highly relevant for the purpose of this Synthesis report. (Government of Germany)	
SPM-875	G-SPM-19	B	7	12			Change Title to "Assessing the Risks of Climate Change" (Government of United Kingdom)	Rejected. The proposed wording departs too far from the prescribed topic heading on which this SPM section is based.
SPM-876	E-SPM-539	A	7	13	7	13	scenarios: scientific expression incomprehensible for policymakers. Is it possible to define it in a Box including also SPM.1 of IPCC WGIII, Summary for policymakers? Relationship with 3categories of stabilization" must also be presented (see 33 and 47). (Annick Douguédroit, Université de Provence)	Space limitation is in the SPM hinder including more details. This subject is covered in topic 3. Shortened heading no longer contains the word scenario.
SPM-877	G-SPM-293	A	7	14	7	14	An additional suggestion for the needed chapeau to this section is that information be provided on what's new since the TAR. For projections, suggest WG1 SPM, text box at top of page 10 under "Projections of Future Changes in Climate". Alternatively one could use: SYR, Topic 3, page 2, lines 11 to 14. In terms of impacts, consider using material from the SYR SPM, page 10, lines 14 to 16. (Government of Canada)	The chapeau clearly states what is covered in the following section. The bullet points which follow the chapeau have been modified.
SPM-878	G-SPM-294	A	7	14	7	14	Again, this section needs some introductory text. Within such text, it is important to define what is meant by near and long term, as used in the title to this section of the SPM. For general context setting text, we suggest the following (drawn from page 10 of the WGI SPM (caption to Projections of Future CC) and from page 7 of WGII SPM (caption to Current Knowledge about future impacts): "A major advance of this assessment of climate change projections compared with the TAR is the large number of simulations available from a broader range of models which have provided a quantitative basis for estimating likelihoods for many aspects of future climate change. Model simulations cover a range of possible futures based on varying assumptions about changes in emissions or atmospheric concentrations. The magnitude and timing of impacts will vary with the amount and timing of climate change." (Government of Canada)	Space limitations hinder adding text. The bullet points have been modified to make the time scales clearer.
SPM-879	E-SPM-4	B	7	15	4	15	I think that the sentence would be more clear such as : " There is high agreement and much evidence that even with current ..."	Rejected. WGIII SPM language.

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							(Constanta Boroneant, National Meteorological Administration)	
SPM-880	E-SPM-545	A	7	15	7	15	The phrase "high agreement" is quite awkward--it would be better to say "strong agreement" (Michael MacCracken, Climate Institute)	Rejected. WGIII SPM language.
SPM-881	E-SPM-548	A	7	15	7	15	Add: 3.1 Future warming, other climate effects and sea-rise and put off for two lines the following text. Part 3 with 6 pages is long; A subdivision is a manner for getting one's bearing in that part. (Annick Douguédroit, Université de Provence)	Rejected. Here we introduce the SRES scenarios which are used throughout the rest of the document.
SPM-882	G-SPM-296	A	7	15	7	15	Replace "with" with "despite" to show that while current policies are having an impact it is currently not sufficient to halt emission growth (Government of Australia)	Rejected. WGIII SPM language.
SPM-883	G-SPM-298	A	7	15	7	15	after "high agreement and much evidence" refer to a new footnote based on SYR Introduction p3, l1-6: "Self-explanatory terms like "high agreement" and "much evidence" refer to the qualitative assessment of uncertainty used by WG III". (Government of Netherlands)	The uncertainty language is referenced and described on page 1, footnote of the SPM.
SPM-884	G-SPM-24	C	7	15	7	15	Maybe state that the high agreement is between the experts ? (Government of Belgium)	Space limitation hinder adding these details. The uncertainty language is referenced and described on page 1, footnote of the SPM.
SPM-885	E-SPM-549	A	7	15	7	16	"that with current climate change mitigation policies" - should insert "climate change greenhouse gas mitigation policies". Many communities such as emergency managers and public health refer to adaptation as a form of "mitigation". (Peter Berry, Health Canada)	Space limitation hinder adding these details. WGIII approved SPM language.
SPM-886	E-SPM-540	A	7	15	7	17	With' mitigation policie and SD practices might read better as "even with" or "despite". With the current phrasing, it reads as if the growth in global GHG emissions is due to mitigation and SD. (Harald Winkler, Energy Research Centre, University of Cape Town)	Rejected. WGIII approved SPM language
SPM-887	E-SPM-541	A	7	15	7	17	This sentence could be read as saying that climate change mitigation and sustainable development policies cause increasing greenhouse gas emissions. This could be remedied by inserting 'the limited' before 'current climate change mitigation policies'. (Nathan Gillett, University of East Anglia)	Rejected. WGIII approved SPM language
SPM-888	E-SPM-543	A	7	15	7	17	This means emissions over the globe, per year. It would be nice to emphasize that -- because this is not just talking about a continued increase in concentrations.	Rejected. WGIII approved SPM language and space limitations.

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							(Noel Gurwick, Carnegie Institution)	
SPM-889	E-SPM-546	A	7	15	7	17	Surely the point here is that even with the current policies and practices, GHG emissions will continue to grow and GHG concentrations will not stabilise. (Archie McCulloch, University of Bristol)	Noted.
SPM-890	E-SPM-544	A	7	15	7	24	The statement in bold refers to scenarios WITH policy intervention, the two supporting paragraphs focus on SRES and non-mitigation scenarios only. The section needs a statement on mitigation or stabilisation scenarios. E.g. drawing on SPM WGIII, para 18: "The lower the stabilization level, the more quickly [a] peak and decline would need to occur." (Harald Winkler, Energy Research Centre, University of Cape Town)	Space limitations hinder adding more details. The statement does not apply to stabilisation scenarios.
SPM-891	G-SPM-297	A	7	15	7	24	For a policy maker it is important what emission profile the SRES scenarios represent for the specific cases, certainly because in Table SPM-1 they are linked to temperature rises. For instance, what do they (B1, A1, etc.) mean in emission levels in 2030, 2050 and 2100 compared to today. If this information is not clearly presented, it is difficult for a policy maker make a link between baseline emissions and temperature impacts. Similarly a link to ppmv CO2-equi. levels in for instance 2100 could be added through an illustrative figure. (Government of European Community)	Accepted, such a figure has been added to topic 3 and a footnote was added in the SPM. Space limitations duplicating the figure here.
SPM-892	E-SPM-542	A	7	15	7	37	This section fails to make two fundamental points that policymakers have to understand if they are to do anything meaningful. It talks about emissions without establishing the connection between emissions and concentrations, indeed reinforcing the stereotype (in line 26) that impacts stem only from emissions. This has the effect of leading policymakers to think that a reduction in emissions pro-rates to a reduction in impact. At some point, the relationship between emissions and concentrations should be explained, together with the attendant asymmetry of impact - the effect of releases is immediate but removal of a GHG takes a minimum of 50 years. This was covered in previous Assessments but needs to be restated in the hope that the policymakers might eventually understand it. (Archie McCulloch, University of Bristol)	This discussion is now clearer in topic 3. In addition topic 5 and table SPM 4 discuss/illustrate timescale implications of emissions for achieving stabilization of concentrations.
SPM-893	E-SPM-547	A	7	15			Rephrase to read "evidence that, even if we adopt mitigation policies today, global greenhouse gas emissions ..." (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Rejected. Approved language of WGIII SPM and space limitations. Comment also is not generally correct: If we adopt a stringent mitigation, emission could decrease.
SPM-894	G-SPM-295	A	7	15			Since current climate change mitigation policies and practices much are characterized by the lack of approach to "sustainable development", we propose that this term is deleted from the sentence.	Rejected. Approved language of WGIII SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of Norway)	
SPM-895	G-SPM-20	B	7	15			The different likelihood statements used in the SPM between the working groups could cause confusion. These are explained in the full text, but a footnote in the SPM (at least pointing to the explanatory box) would be helpful. (Government of United Kingdom)	Accepted. Footnote inserted at first use of likelihood statement.on page 1 of the SPM
SPM-896	G-SPM-299	A	7	16	7	16	Delete the word "sustainable" : if the current policies do not permit to avoid a GHG emissions growth, the related development practices cannot be qualified as sustainable. (Government of France)	Rejected. Approved language of WGIII SPM.
SPM-897	G-SPM-300	A	7	16			Delete the phrase: "and sustainable developmet" (Government of Cuba)	Rejected. Approved language of WGIII SPM.
SPM-898	E-SPM-551	A	7	17	7	17decades, add:(until 2030). (Annick Douguédroit, Université de Provence)	Rejected. Unjustified level of precision.
SPM-899	E-SPM-550	A	7	17	7	19	I suggest to add "by various authors worldwide" after "emission scenarios published". I believe it is not clear to a policymakers who published these new scenarios, IPCC or others. (Stefano Caserini, Politecnico di Milano)	Rejected as redundant.
SPM-900	E-SPM-553	A	7	19	7	20	Sentence is very unclear - "Baseline scenarios...since SRES are comparable to thos presented in SRES" - what does this mean? (Peter Berry, Health Canada)	Taken into account: Text modified.
SPM-901	E-SPM-554	A	7	19	7	20	paragraph not clear, the same for sections 3.1 and 3.2.1 (Monica Beatriz Wehbe, National University Rio Cuarto)	Noted: Text modified. Also see new Fig 3.1 in Topic 3.
SPM-902	E-SPM-555	A	7	19	7	20	Omit these two lines as they are unnecessary. (John R. Porter, University of Copenhagen)	Rejected. Clarifying the consistency between SRES and the new literature is important, since temperature projections are based on SRES. Text modified.
SPM-903	E-SPM-556	A	7	19	7	20	I don't think that this sentence is clear enough for policymakers (Javier Martin-Vide, Group of Climatology)	Taken into account: Text modified. Also see new Fig.3.1 in Topic 3.
SPM-904	E-SPM-557	A	7	19	7	20	delete this sentence (Suam Kim, Pukyong National University)	Rejected. Clarifying the consistency between SRES and the new literature is important, since many climate changes and impacts projections are based on SRES.

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SPM-905	E-SPM-558	A	7	19	7	20	As the SPM is intended to be a stand-alone report I think it is essential that these base-line scenarios be explained. Some understanding of these is critical to understanding the whole section of the SPM relating to Topic 3, but the SPM is intended for people who have no background in climate change science, many of whom will never have heard of SRES, and who should not be expected to have to refer to it to understand the SPM. Inclusion of Note 2 on page 1 of Topic 3 would help, but even this would be improved by relating the emission scenarios to such terms as estimated high, low, average etc. To a lay person numbers as such as 600, 700, 800, etc have little meaning unless qualified in this manner. (George Walker, Aon Re Asia Pacific)	Rejected due to space limitations. Footnote has been added providing reference to explanation of SRES scenarios in topic 3 Also text modified for clarification. A new figure 3.1 has been added to topic 3.
SPM-906	E-SPM-559	A	7	19	7	20	Add the definition of baseline and mitigation scenarios as footnote. (Shigeki Kobayashi, Toyota Research and Development Laboratories, Inc.)	Text revised: 'baseline' replaced with 'non-mitigation'.
SPM-907	G-SPM-302	A	7	19	7	20	We question whether this line has its place in the SyR SPM and suggest deleting it. There is insufficient room to place this line in the appropriate context here and as we think it covered well in the WG3 SPM, it does not seem to add much to the discussion. If it is to be kept in, it should be placed in the same bullet as lines 22-24 (at the end of the bullet) (Government of Canada)	Clarifying the consistency between SRES and the new literature is important, since temperature projections are based on SRES. Order of paragraphs has been changed to place more emphasis on SRES.
SPM-908	G-SPM-304	A	7	19	7	20	The language is technical. Perhaps it would be more accessible if the first sentence started: "Scenarios of future emissions are developed and used in order to explore how emissions may develop under different circumstances in order to model future climate change and provide baselines for assessing mitigation options." Then the rest could follow. (Government of Sweden)	Text slightly modified, but follows approved WGIII SPM wording.
SPM-909	G-SPM-306	A	7	19	7	20	Add information on comparison of SRES scenarios with observed trends. (Government of Germany)	Rejected. Observed trends are discussed in "Causes of change" earlier in the SPM.
SPM-910	G-SPM-25	C	7	19	7	20	maybe somewhat unclear what is meant for the lay man; make it clear that AR4 is using the SRES scenario's but that there are other baseline scenarios published since then that are similar (Government of Belgium)	Paragraph modified to clarify.
SPM-911	G-SPM-301	A	7	19	7	23	What does "baseline" mean? It appears to be jargon and is used differently in lines 19, 22, and 32. Recommend dropping it from 19 and 22 (not helpful) and replacing it with "non-mitigation" in line 32. (Government of United States)	The word baseline is deleted and the text modified.
SPM-912	G-SPM-303	A	7	19	7	24	This section would be improved if the footnotes #1 and #2 from page 1 of Topic 3 were	Text modified for clarification.

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							included for context. (Government of Canada)	Also Footnote added pointing to more detailed explanation of SRES in topic 3.
SPM-913	G-SPM-22	B	7	19	7	24	It would be better if the order of these two paragraphs were changed - then it would give the SRES ranges first then compare to these (Government of United Kingdom)	Accepted
SPM-914	G-SPM-305	A	7	19	7	33	suggest just writing "baseline scenarios" instead of "baseline emissions scenarios" (Government of Republic of Korea)	Rejected. Important to note that these are emission scenarios. Text has been modified.
SPM-915	E-SPM-552	A	7	19			SRES scenarios need a little explanation to non-experts. Also we should compare current 'business as usual' projections with the SRES set. (Joe Ravetz, University of Manchester)	Rejected due to space limitations. Footnote added pointing to more detailed information in topic 3.
SPM-916	G-SPM-21	B	7	19			It would be helpful to introduce a brief description of the SRES scenarios in plain language and to show what the emissions scenarios are. (Government of United Kingdom)	Rejected due to space limitations. Footnote added pointing to more detailed information and new figure 3.1 in topic 3.
SPM-917	E-SPM-561	A	7	20	7	20	...presented in the SRES.' (Steven Clemens, Brown University)	Text revised.
SPM-918	G-SPM-307	A	7	20	7	20	The SPM should include an explanation of the SRES. (Government of Australia)	Rejected due to space limitations. Footnote added pointing to more detailed information in topic 3.
SPM-919	G-SPM-308	A	7	20	7	20	Insert: ... (SRES) yield GHG emissions that era comparable ... (Government of Switzerland)	Text revised.
SPM-920	E-SPM-560	A	7	20			Duplicate SRES is somewhat confusing... (Michel Rixen, NATO Undersea Research Center)	Text revised
SPM-921	E-SPM-562	A	7	22	7	22	The SRES scenarios project...' (Steven Clemens, Brown University)	Text revised.
SPM-922	E-SPM-564	A	7	22	7	22	change 'SRES scenarios' to 'IPCC Special Report on Emission Scenarios (SRES)' (Suam Kim, Pukyong National University)	Text re-ordered and revised.
SPM-923	E-SPM-565	A	7	22	7	22	25-90% of what? 2000 levels? The paragraph would be better written as 'Given a dominant position for fossil fuels as global energy sources to 2030 and beyond, the IPCC SRES forecasts an increase in greenhouse gas emissions of 25-90%, depending on scenario, compared to those in 2000.	Rejected. It is clear from the text that the increase refers to 2000.

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							(John R. Porter, University of Copenhagen)	
SPM-924	G-SPM-309	A	7	22	7	22	Would it not be more appropriate to say that a scenario anticipate, rather than project which is the right term for a model ? (Government of France)	Rejected. Approved language of WGIII SPM and standard use of terminology.
SPM-925	G-SPM-312	A	7	22	7	22	Add the numerical value of GHG increases, "a range of 9.7 GtCO ₂ -eq to 36.7 GtCO ₂ -eq (25-90%)" for more scientific explanation. The new sentence now reads, "SRES scenarios project an increase of baseline global greenhouse gas emissions by a range of 9.7 GtCO ₂ -eq to 36.7 GtCO ₂ -eq (25-90%)". (Government of Japan)	Rejected. Too detailed for SPM. Information is in longer report.
SPM-926	E-SPM-563	A	7	22	7	24	The sentence should be rephrased as follows: "SRES scenarios project an increase of baseline global greenhouse gas emissions by 25-90% between 2000 and 2030. In these scenarios, there are no effective policies to promote low carbon and renewable energy sources and fossil fuels are projected to maintain their dominant position in the global energy mix to 2030 and beyond." Reason: the problem of fossil fuels maintaining a dominant position is linked to the absence of effective measures to promote low carbon and renewable energy sources. (Christian Kjaer, European Wind Energy Association (EWEA))	Rejected. Lack of climate policies implicit in use of 'non-mitigation' terminology. Some scenarios promote renewable energy for other reasons and this is included in SRES where relevant.
SPM-927	G-SPM-310	A	7	22	7	24	This section is weak in its treatment of projections of future emissions. We suggest adding the following 2 lines that provides valuable information to policy makers. "In the same period, CO ₂ emissions from energy use are projected to grow by 45-110%, with 2/3 to 3/4 of the projected increase coming from non-Annex I regions. Non-Annex I per capita energy CO ₂ emissions are projected to remain substantially lower than Annex I, while Annex I economies are projected to have lower energy use per unit of GDP." (From WG3 page SPM-3) (Government of Canada)	Rejected due to space limitations. Reference to topic 3 added.
SPM-928	G-SPM-311	A	7	22	7	24	Edit this sentence to read: "Under the SRES scenarios, global greenhouse gas emissions are projected to increase anywhere from 25 to 90% between 2000 and 2030, with fossil fuels maintaining their dominant position in the global energy mix to 2030 and beyond. {3.1}" (Government of United States)	Rejected. Wording based on approved language of WGIII SPM.
SPM-929	E-SPM-566	A	7	26	7	26	The use of "would" without a qualifier seems awkward. I would say "would very likely" or "would likely" depending on the strength of the statement and your evidence. (Katherine Casey Delhotal, RTI International)	Rejected. Approved language of WGI SPM.
SPM-930	E-SPM-567	A	7	26	7	29	Especially here, it would be useful to make the link to concentrations in between talking about emissions and warming.	Rejected. Space limitations hinder going from emission to

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							(Noel Gurwick, Carnegie Institution)	concentration to temperature. Topic 3 and 5 as well as table SPM 4 make those connections.
SPM-931	E-SPM-570	A	7	31	7	31	needs "global average" before "warming" (Keith Shine, University of Reading)	Rejected. Not necessary in view of space limitations.
SPM-932	E-SPM-572	A	7	31	7	31	It seems strange not to have a plus or minus estimate along with the 0.2 C--saying "about" is interesting, but not very helpful. (Michael MacCracken, Climate Institute)	Rejected. Approved language of WGI SPM. Full uncertainty range has not been assessed for all SRES scenarios.
SPM-933	E-SPM-576	A	7	31	7	31decades, add:(until 2030) a warming... (Annick Douguédroit, Université de Provence)	Rejected. Inappropriate level of precision.
SPM-934	E-SPM-568	A	7	31	7	33	The sentence should be rephrased as follows: "(...) is projected for a range of plausible non-mitigation emission scenarios". (Christian Kjaer, European Wind Energy Association (EWEA))	Text modified. The statement is across the SRES
SPM-935	E-SPM-569	A	7	31	7	33	The expected amount of sea level rise and increased acidification should also be mentioned--they are likely to be very important. (Michael MacCracken, Climate Institute)	Rejected. This bullet is for near term projections. Near-term sea-level rise has not been assessed.
SPM-936	E-SPM-571	A	7	31	7	33	move this sentence to 'between Line 24 and 26' (Suam Kim, Pukyong National University)	Rejected. Would break the logic of narration.
SPM-937	E-SPM-573	A	7	31	7	33	I don't understand concept of baseline scenario as defined in sentence 19. Why would we use an unrealistic and inaccurate scenario of "non-mitigation"? Countries are mitigating GHGs - not likely fast enough but they are mitigating. Are these captured by the "range of plausible baseline emissions scenarios". If not, as a policy maker I am tempted to discount this finding given it does not reflect reality. (Peter Berry, Health Canada)	Baseline scenarios are an important part of the assessment as there are considerable uncertainties about the extent of climate policies in the long term. Moreover this statement is only for the next 2 decades.
SPM-938	E-SPM-574	A	7	31	7	33	For the next....pathways. In bold because it is a fundamental conclusion (Annick Douguédroit, Université de Provence)	Rejected. Increased proportion of bold would devalue the rest messages in bold.
SPM-939	E-SPM-575	A	7	31	7	33	Does this refer to non-mitigation scenarios? (Kenneth Möllersten, Swedish Energy Agency)	Yes. Text modified to make it clear that it applies to the SRES.
SPM-940	G-SPM-313	A	7	31	7	33	Suggest these sentences be broken into two and edited slightly: "For the next two decades a warming of about 0.2°C per decade is projected for a range of plausible baseline emissions scenarios. Beyond the next few decades, temperature projections depend increasingly on socio-economic scenarios and the resulting emissions pathways.	Accepted.

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							{3.2}" (Government of United States)	
SPM-941	G-SPM-23	B	7	31			Probably better to formulate the rise in temperature over the next two decades as a total increase rather than an increase per decade - to avoid repetition and to make a clearer relationship between the text and Table SPM-1. (Government of United Kingdom)	Rejected. Approved language of WGI SPM. The statement seems clear.
SPM-942	G-SPM-314	A	7	32	7	33	The emission pathway is not only a result of socio-economic factors but also on mitigation. We suggest the following rewrite of the last part of the sentence in order to make the language less scientific and easier to understand: "...while beyond the next few decades, the changes in the climate system depend increasingly on the choice of socio-economic development and emissions pathways." (Government of Norway)	Rejected: Emissions pathways can include mitigation. Wording changed to general phrase 'scenarios of future GHG emissions'.
SPM-943	E-SPM-578	A	7	33	7	33	change 'emissions pathways' to 'emission pathways (Table SPM-1 and Figure SPM-5)' (Suam Kim, Pukyong National University)	"Pathways" deleted. .
SPM-944	G-SPM-316	A	7	33	7	33	"a blank" is needed : pathways.{3.2} ⇒ pathways. {3.2} (Government of Republic of Korea)	Pathways deleted.
SPM-945	E-SPM-577	A	7	33			Give a little bit more explanation what 0.2oC increase means. For instance, "This tempreature increase rate is largest in the last X years". (Kenichi Matsuoka, University of Washington)	Rejected due to space limitations. Can be determined from Figure SPM-5.
SPM-946	G-SPM-315	A	7	33			including international actions to reduce GHG emissions. (Government of Ireland)	Rejected: Idea is Included in general statement. Space limitations hinder adding more details.
SPM-947	G-SPM-317	A	7	34	7	37	This paragraph needs to be preceded with some information about the probabilistic climate change projections to reinforce for policymakers the value of these projections and the significant advance from the TAR in being able to provide such projections. This was something that policy-makers were specifically asking for. Suggest the following text, drawn from: "A number of methods for providing probabilistic climate change projections have emerged and have enabled an assessment of what global temperature changes are considered 'likely' by 2100, a significant advance since the TAR." (Government of Canada)	Text deleted. Space limitations adding more details. Some parts of the comment are discussed in the bullet following the table.
SPM-948	G-SPM-318	A	7	35	7	37	For the sake of brevity, merging these lines (description) in the heading on the following page (p.8, line 1-2) is suggested. (Government of Japan)	Text removed.

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SPM-949	G-SPM-319	A	7	35	7	37	As written, this sentence implies that a best estimate is given for sea level. To make clear that it does not, suggest the following "Table SPM-1 lists the best estimates and assessed likely uncertainty ranges of projected warming for the end of the 21st century for each of the six SRES marker scenarios. Further, it provides ranges of model-based projections of sea-level rise. {3.2.1}" (Government of United States)	Text removed.
SPM-950	G-SPM-24	B	7	35	7	37	Also refer to what Figure SPM-5 shows (Government of United Kingdom)	Text removed.
SPM-951	E-SPM-579	A	7	35			Word "likely" could be omitted here for ease of reading. It's specified in the figure caption that the uncertainty range is the likely one. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text removed.
SPM-952	G-SPM-320	A	7	36	7	36	For clearness and comparison is usefull to inform about the projected decade, so put in brackets after "the 21st century": (2090 -2099) (Government of Germany)	Text removed.
SPM-953	G-SPM-321	A	7	36	7	36	Explain what a "marker scenario" is. Also, this the first time that there has been a reference to there being "six" SRES scenarios. Why not introduce this earlier in the discussion? For example, on page 7, line 22, insert the phrase "The six" before "SRES" and insert "emissions marker" before "scenarios". (Government of United States)	Text removed. Information on the marker scenarios is added in footnote c on table SPM-1.
SPM-954	G-SPM-322	A	7	37	7	37	For better understanding it is better to write "projections of global average sea-level rise" (Government of Germany)	Text removed.
SPM-955	G-SPM-323	A	7	38	7	38	Wouldn't it be informative to explain the concept of climate sensitivity and the fact that the range has changed since the TAR, certainly because of its impacts on low stabilisation scenarios? (Government of European Community)	Rejected. Would require too much space and not directly relevant for AOGCM projections shown in the following section of text..
SPM-956	E-SPM-580	A	7	39	7	37	New lines after "...sea-level rise." To put attention on the line « constant ...concentration » of SPM-1:" Even with constant year 2000 concentrations temperature will increase till the end of the 21th century because of the CO2 molecule long life." (Annick Douguédroit, Université de Provence)	Rejected due to space limitations. This is covered later in the text.
SPM-957	G-SPM-324	A	8	1	8	2	Although some readers may be familiar with the various SRES scenarios, it will not be easy for a first-time reader to understand the difference in scenarios (B1, A1T, B2,...,etc). We therefore propose that the scenarios are briefly described in the SPM.	Taken into account. Footnote added providing reference to SRES explanation in longer report.

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							(Government of Norway)	
SPM-958	E-SPM-583	A	8	1	8	3	Model-run names B1-A1F1 are not explained in the summary. As stated in page 1 footnote in Topic 3, give a short description of model runs. (Kenichi Matsuoka, University of Washington)	Taken into account. Footnote added providing reference to SRES explanation in longer report.
SPM-959	E-SPM-581	A	8	1	8	7	This Table is VERY MISLEADING as the context of the changes in temperature and in sea level are very different. To derive the temperature estimates, a wide range of emissions scenarios and a wide range of likely climate sensitivity are used (with the latter accounting for both processes we understand and those we do not). This gives a quite wide range that very likely encompasses the change that is likely to happen. For the sea level estimates, this is not the case--while the wide range of emissions scenario is used, the numerical values include only those processes that we understand, and exclude the likely influences of process we do not--and this is particularly egregious as these excluded terms are, based on paleoclimatic experience, likely to be the largest contributors to long-term des level change. Just adding in the phrase "excluding future rapid dynamical changes in ice-flow" is not adequate--it gives no sense of the relative magnitude and importance of the terms--and that it is unlikely the climate models could come at all close to modeling the rates or amounts of sea level rise that we know occurred. I think it is absolutely essential to redo this table to convey the serious limitations of the sea level estimates for it is misleading and even improper to be conveying information this way--it is like suggesting a pedestrian watch out for a banana peel on the sidewalk when an uncountable number of tonnes of bricks are hurtling down at them. The Eemian had a 4-6 m sea level rise in a relatively short interglacial--and was only a degree or so warmer on a global basis. Coastal managers need to be made aware that the potential exists for a much greater rise, and that our existing capabilities for making estimates cannot explain about 40% of the rise since 1961 and the modeling capabilities cannot explain the recent acceleration in the rate (sure, we can explain it with observations of heat uptake--but do the models represent that?). The IPCC is going to very much regret having used this type of formulation--it does not come close to encompassing the range of expert opinion about the potential for larger rates and amounts of sea level rise. (Michael MacCracken, Climate Institute)	The table is approved in the WGI SPM. The analog of future climate changes to past climates is very difficult. The exact forcings (e.g. aerosols) and timing of the past climate changes are not well known. The wording for the land ice uncertainties in the text has been revised to better explain uncertainties.
SPM-960	E-SPM-584	A	8	1	8	7	I am missing a footnote after "Likely range" indicating what range climate system sensitivity was assumed. This is important in particular because the C-cycle feedbacks as currently studied do mostly ignore other global trends affecting the C-cycle, e.g. land-use change. Make also sure it is clear how these findings relate and compare to those shown in Figure SPM-8 (p. 19), where a range of climate sensitivity of 2-3°C was used. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected: Climate sensitivity was not assumed, but derived from results of many IPCC models as shown in the table footnote. Carbon-cycle feedback is noted in the text.
SPM-961	E-SPM-582	A	8	1	8	16	The modelers need to look up from their computer screens once in a while a get a sense of reality. The Earth has warmed during the heart of industrial expansion only about less than 1	Rejected. No specific suggestions. Projections make no judgement

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							deg C. (perhaps much less once urban heat island effects get properly adjusted in the next few years) since the beginning of the instrumented record in the 1850s (a cold period). We cannot realistically think it will warm 3 more this century (midpoint of the estimate), and that warming will automatically leave us "worse" off given that peak oil may have passed and peak coal is a decade or two away. I sense that activism or narrow focus is clouding too many eyes to the truth. (John Everett, Ocean Associates, Inc.)	on impacts, and emission scenarios are based on wide range of alternative scenarios.
SPM-962	E-SPM-585	A	8	1	18	1	But some aspects can be understandable for non expert readers. My principal question was the presentations predictions results about future sea level rise in tables SPM-1 and SPM-3. In the last table values of sea level rise for different stabilisation CO2 concentration was show; these values are much higher than predicted for models for different SRES at the same time, end of the 21 century. Policymakers can see these discrepancies as indetermination between experts. I suggest a better explanation for these differences, and not sentences based in the results for each table (Ricardo Anadón, Universidad de Oviedo)	SPM-1 is projection for 2100 and SPM-3 is the one for equilibrium states (1,000 years after). This distinction is clear in the tables.
SPM-963	E-SPM-586	A	8	2	8	2	Tab SPM-1: Line Constant ...concentration: what is NA? (Annick Douguédroit, Université de Provence)	Not Available. Text modified.
SPM-964	G-SPM-26	C	8	3	8	4	define F-gases (is it just SF6?); not completely excluded from the Figure, as they appear in SPM-3(b). (Government of Belgium)	Rejected as misplaced comment.
SPM-965	E-SPM-587	A	8	5	8	6	increase font size of "General Circulation" (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Text deleted. AOGCM used.
SPM-966	E-SPM-588	A	8	10	8	10	It seems like like the focus is moving now to a comparison with previous assessment now. Perhaps a subheading to indicate that would be useful and help the reader understand the flow of the document. (Noel Gurwick, Carnegie Institution)	Rejected due to space limits. The discussion is on the new projections..
SPM-967	G-SPM-325	A	8	10	8	10	The previous assessment - is that the TAR which is referred to? Please make clear. (Government of Sweden)	Approved WGI SPM language. Seems to clearly point to the TAR.
SPM-968	G-SPM-326	A	8	10	8	15	Text clarity could be improved to convey key points, I.e uncertainties reduced relative to TAR, carbon feedback and sea-level rise are subject to considerable uncertainty. (Government of Ireland)	Text seems clear and is very close to the WGI approved SPM language..
SPM-969	G-SPM-328	A	8	10	8	15	It does not seem correct that "a broader range of models" would change the probability distribution, although inclusion for more components of the climate system or more feedbacks would do so. Suggest revising to note that some possible, newly evaluated climate feedbacks tend to skew the probability to the high end.	Rejected. It is a statement of fact that the broader range of models give higher upper temperature ranges. Approved

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							(Government of United States)	WGI SPM wording.
SPM-970	G-SPM-327	A	8	10	8	22	Reference to “the previous assessment” is confusing and should be replaced with “the TAR.” (Government of Japan)	Approved WGI SPM language. Seems to clearly point to the TAR..
SPM-971	G-SPM-330	A	8	12	8	12	suggest writing "that suggest stronger climate-carbon cycle feedbacks" instead of "and carbon cycle feedbacks" (Government of Republic of Korea)	Text modified
SPM-972	G-SPM-329	A	8	12	8	15	This explanation of carbon cycle feedbacks would be more appropriate as a footnote. (Government of Australia)	Rejected. New information on carbon cycle feedbacks is one of the key findings of the AR4.
SPM-973	E-SPM-589	A	8	12			when "carbon cycle feedbacks" is first mentioned it would be helpful to have a few words stating example feedbacks -- perhaps as a footnote?? (Herman Sievering, University of Colorado)	Rejected due to space limits. The underlying text provides much more details..
SPM-974	G-SPM-331	A	8	14	8	14	This sentence should emphasize that the uncertainty lies in the magnitude of this feedback but that there is high agreement that it is positive. Suggest using this line from the WGI Technical Summary (from TS-45 lines 50 -53) instead of the existing sentence on lines 14-15: "All models that treat this coupling of the carbon cycle to climate change indicate this positive feedback, but the strength of the feedback varies among models." (Government of Canada)	Rejected. The wording already states that feedback is positive, but the strength varies.
SPM-975	G-SPM-332	A	8	15	8	15	Include the highly policy relevant information from WG I SPM and from the topic on the comparison with TAR: "TAR projections were made for 2100, whereas projections in this report are for 2090-2099. The TAR would have had similar ranges to those in Table SPM-1 if it had treated the uncertainties in the same way. Also include information on comparison of projections with observed trends. (Government of Germany)	Rejected due to space limitations. Topic 3 covers the additional details – “broadly consistent” seems to be a good summary.
SPM-976	E-SPM-597	A	8	17	8	12	After ..."have been considered." it could be interesting for policymakers to stress on the increasing warmth when CO2 concentrations increase. They must be helped to read the summary conclusions related to energy decisions. And written in bold. (Annick Douguédroit, Université de Provence)	Rejected as redundant.
SPM-977	E-SPM-593	A	8	17	8	17	The first sentence here is totally misleading--it may be that the uncertainties for the small terms are better understood, but this does not mean that we have narrower uncertainties for the whole term--indeed, the terms that are left out are looking to be more and more important and the potential for greater sea level change is growing--not shrinking. Keeping the text this way in a report for policymakers is a serious mistake.	Text modified to better express uncertainties and resulting caveats about model projections.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Michael MacCracken, Climate Institute)	
SPM-978	G-SPM-334	A	8	17	8	17	This paragraph about uncertainties in the SLR projections should be preceded by a more general statement about what is projected for sea level. Suggest something like: Sea level is projected to continue rising over the coming century due to the thermal expansion of warming water and contributions from melting land ice." (Government of Canada)	Rejected due to space limitations. The table 3.1 gives those projections.
SPM-979	E-SPM-596	A	8	17	8	18	Given the importance of projected sea level rise, some explanation of which uncertainties have been reduced and why they have been reduced should be added. The narrower uncertainty range implies that policymakers should have greater confidence in the projection of sea level rise -- they should be told the basis for that greater confidence. (Robert Siveter, IPIECA)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-980	G-SPM-337	A	8	17	8	18	Given the importance of projected sea-level rise, some explanation of which uncertainties have been reduced and why they have been reduced should be added. The narrower uncertainty range implies that policymakers should have greater confidence in the projection of sea level rise. They should be told the basis for that greater confidence. (Government of United States)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-981	G-SPM-333	A	8	17	8	20	This sentence is very long and we suggest to divide it so it reads: ".....in the projected contributions. However, they do not include....." (Government of Norway)	Text modified.
SPM-982	G-SPM-335	A	8	17	8	20	The phrase "Model uncertainties" is not clear. Change it to read: "Model-based uncertainty ranges". (Government of United States)	Text modified.
SPM-983	E-SPM-590	A	8	17	8	22	This paragraph needs to be reworded. It is contradictory as it stands. It starts off by saying the uncertainties are smaller then previous assessments and then makes it clear that several uncertainties are ignored. It is inappropriate to make uncertainties smaller by ignoring some of them. (John Church, CSIRO)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-984	E-SPM-591	A	8	17	8	22	This paragraph is very specific about sources of uncertainty that are not included in the reported SLR ranges, but is very unclear about which sources of uncertainty are included, and which uncertainties have decreased compared to the previous assessment. I suggest clearly specifying the sources of uncertainty that are included in addition to those that are excluded, and including a statement about which included uncertainties have decreased. (Michael Mastrandrea, Stanford University)	Text modified to better express uncertainties and resulting caveats about model projections.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-985	E-SPM-594	A	8	17	8	22	It is misleading to state that sea level rise has reduced uncertainties, as the treatment of both ground water and ice sheet flows are essentially neglected. (Michael Manton, Monash University)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-986	E-SPM-595	A	8	17	8	22	It is important to inform that whether or not there is AGW, SLR will happen and then show both (natural and AGW) components. Too few people are aware that in the NW Atlantic for example, only a few thousand years ago Georges Bank and Nantucket Island were part of the mainland. Most think that the whole SLR is anthropogenic. (John Everett, Ocean Associates, Inc.)	Rejected. Space limitations hinder adding these details. It is clear that only the human part of SLR is being discussed..
SPM-987	G-SPM-336	A	8	17	8	22	Text could be restructured for clarity, e.g. finish sentence L10 at assessment. Use Topic text for rest of para. (Government of Ireland)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-988	E-SPM-592	A	8	17			This is an extremely important point that the underlying WGI SPM and even the chapters did not succeed in fully clarifying. I have heard some of the CLAs involved in ice/SLR sections indicate that they themselves do not understand all the factors affecting the changes in SLR uncertainty, and its resultant decrease. The SYR provides an opportunity to be much clearer but the present version fails to do so. The term "model uncertainties" is misleading because the uncertainties this term refers to are only of one particular type. They do not reflect, for instance, the level of confidence in ice sheet models, as the second part of this paragraph indicates. I suggest more specificity by beginning the paragraph with a phrase like "Uncertainties in SLR are of several types" and then enumerating the various classes of uncertainty that are captured in the numerical estimates (like uncertainty in climate sensitivity) and those that are not (like uncertainty in ice sheet dynamics), and indicating which class has caused the decrease in range. If a clearer explanation cannot be given in the space permitted, then I suggest that the SLR column of Table SPM-1 be completed eliminated because highlighting numerical values without appropriate interpretative contextual material is certainly misleading. (Michael Oppenheimer, Princeton University)	Text modified to better express uncertainties and resulting caveats about model projections. The WGI assessment is complete.
SPM-989	E-SPM-599	A	8	19	8	19	Feedbacks should be elaborated more. (Motoyoshi Ikeda, Hokkaido University)	Rejected due to space limitations
SPM-990	E-SPM-598	A	8	19	8	20	what is meant by the term "full effects" The relevant paragraph in section 3.2.1, also uses the term "full effects" goes on in its following paragraph to say that the current rate of ice sheet flow is projected into the future without change. It is not clear from the text under either topic 3 or from the relevant section of the WG1 report that any model used included any changes in ice sheet flow. The use of the adjective "full" implies to me that there is inclusion of some of the effects of changes in flow. I think that it would be more accurate to drop the adjective "full" in this sentence. (R. Allyn Clarke, Fisheries and Oceans, Bedford Institute of Oceanography)	Text modified to better express uncertainties and resulting caveats about model projections.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-991	E-SPM-600	A	8	20	8	20	The use of "ice sheet flow rate" is too technical for most policy-makers. Please use simpler language. (Kenneth Möllersten, Swedish Energy Agency)	Rejected. Approved language of WGI SPM and appropriate terminology.
SPM-992	G-SPM-340	A	8	20	8	20	Is the term Ice-sheet flow fully understandable for policy makers? (Government of European Community)	This is approved language of WGI SPM and appropriate terminology.
SPM-993	E-SPM-601	A	8	20	8	22	It would be helpful to clearly state inclusion of ice sheet dynamic effects would increase projections of sea level rise (e.g. this is not a +/- factor). Present text does suggest this but not clearly. (Donald Lemmen, Natural Resources Canada)	Text modified to better express uncertainties and resulting caveats about model projections. Knowledge is too limited to say whether the current ice flow rates could possibly also decrease again in future, as stated in topic 3.
SPM-994	E-SPM-602	A	8	20	8	22	Explain more about ice-sheet flow something like "Understanding of possible future changes in Greenland and Antarctic ice sheets together with numerous ice caps in the Arctic is too limited to assess...." (Kenichi Matsuoka, University of Washington)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-995	G-SPM-338	A	8	20	8	22	This result is a key finding of AR4 and should be put in bold in the heading of the paragraph (Government of France)	Rejected. It is not a key finding but a key uncertainty.
SPM-996	G-SPM-339	A	8	20	8	22	The construction of this finding on the uncertainties in ice sheet flow rates tends to reduce the concerns captured in the WG1 SPM, on the possibility that recent observations of flow rates could significantly increase the projections for SLR. The authors should revert to the construction in the WG1 SPM on this issue. (Government of Australia)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-997	E-SPM-603	A	8	21	8	21	We know different studies on quite higher estimations for SLR, for example by Rahmstorf. How to indicate this? Suggestion: 'is still too limited ...' (Manfred Treber, Germanwatch)	Text modified to better express uncertainties and resulting caveats about model projections. The Rahmstorf paper came out too late to be assessed in AR4.
SPM-998	E-SPM-604	A	8	21	8	22	I would suggest that the AR4 does provide at least some additional guidance on the contribution of the ice sheets to sea level changes. As currently presented the suggestion is not very constructive or helpful as the current statement comes across as being primarily negative about the knowledge (Roger Street, UKCIP-OJUCE)	Text modified to better express uncertainties and resulting caveats about model projections. We do not have positive quantitative robust knowledge of future ice sheet flow contributions.

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SPM-999	G-SPM-341	A	8	21	8	22	Modify as follows, "Understanding ofis too limited to assess their likelihood, to provide a best estimate, and to recommend an upper bound for sea-level rise." As written, the full extent of the resulting limitations of model-based projections of sea level is not conveyed. (Government of United States)	Text modified to better express uncertainties and resulting caveats about model projections.
SPM-1000	E-SPM-605	A	8				Table SPM-1: whose best estimate? (Peter Haas, University of Massachusetts)	The assessment of the AR4. Text seems clear.
SPM-1001	E-SPM-606	A	8				Table SPM1: Temperature change and sea level rise are shown relative to "1980-1999". This is inconsistent with Table SPM 3, where these are shown relative to pre-industrial level. If possible, please show the data relative to the same base. (Shigeki Kobayashi, Toyota Research and Development Laboratories, Inc.)	Footnote added to give a general idea of the preindustrial offset in temperature.
SPM-1002	E-SPM-607	A	8				Table SPM-1: I am concerned about the projects of sea level rise from model projections. Recent work has shown that the IPCC assessment scenarios significantly underestimate the rate of mass loss from Greenland (Rahmstorf et al. Science Express, 2007). There are also several other references which have also raised this issue. I think that a statement indicating that IPCC model scenarios are underestimating observed sea level rise would be worthwhile here. (David Barber, University of Manitoba)	Rejected. Approved WGI SPM table. Accompanying text modified to better express uncertainties and resulting caveats about model projections. The Rahmstorf paper came out too late to be assessed in AR4.
SPM-1003	E-SPM-608	A	8				Table SPM-1: along with these tables of temperature and sea level change there needs to be a statement that any change will be spatially variable. I know that will be in the main chapters but it is an important point. (Philip Woodworth , Proudman Oceanographic Laboratory)	Rejected due to space limitations. Spatial variation of temperature is shown in Figure SPM-5. Spatial variation of sea level is not of comparable robustness.
SPM-1004	E-SPM-609	A	8				Table SPM-1. Understanding this table requires specialist knowledge of the SRES scenarios and what 'constant composition' means. A dumb but possible question might be 'If concentrations are constant in 2000 (1st case) then why does the temperature change but the sea level does not?' The sea level rise is also the likely range cf. the temperature change, and not the best estimate. I suggest that you give a verbal description of the A1, A2, B1 and B2 cases in column 1 with a baseline as 'emissions in 2000' and a footnote to say that 'although emissions in 2000 are set as the baseline they are calculated to contribute to global warming and sea-level rise' (John R. Porter, University of Copenhagen)	Rejected. Approved WGI SPM table. Meaning should be clear. Additional footnote points to additional information on SRES in longer report.
SPM-1005	E-SPM-610	A	8				Table SPM-1. I know this is also in the WG1 SPM, but I think the 'NA' in the table for sea level rise based on constant year 2000 concentrations should be replaced with something else. The sea level would rise through the 21st century if CO2 concentrations were held constant at 2000 levels, whereas 'not applicable' suggests that they would remain constant. Perhaps NA	Accepted. 'NA' is spelled out as "Not available"

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							means 'Not available', which is reasonable, but I think this should be spelt out, to avoid the conclusion with 'not applicable'. (Nathan Gillett, University of East Anglia)	
SPM-1006	E-SPM-611	A	8				Table SPM-1, suggested to install the same changes as argued for Table 3.1 (Topic 3, page 3). (Gottfried Kirchengast, Wegener Center for Climate and Global Change, University of Graz)	Wording of text revised to make clear what is included and what is not in the table.
SPM-1007	E-SPM-612	A	8				Table SPM-1, Column on sea level rise. This table is misleading and an additional column should be added with the allowance of the dynamical ice sheet flow as referred to in the WGI SPM added. (John Church, CSIRO)	Rejected. Approved WGI SPM table. Text modified to better express uncertainties and resulting caveats about model projections. Assumption of linear scaling is only one possible assumption, inappropriate to place next to existing column. Space limitation hinder a full discussion here. See underlying text for details.
SPM-1008	E-SPM-613	A	8				Table SPM-1 Insert reference to new footnote “b” alongside existing reference to existing footnote “a”. New footnote “b” should read; “To express temperature changes relative to 1850-1899, add about 0.5 oC” (This clarification drawn from Table SPM-2). Change existing footnote “b” to new footnote “c” and retain. An alternative option is to refer to the 1875 baseline consistently throughout. But this then probably requires clarification that this is the proxy baseline used here (and throughout ?) as “pre-industrial. There is, unfortunately, a large degree of inconsistency throughout AR4 on just which baseline is being used at any particular time. Many people have remarked to me that it is often very difficult to compute and/or compare references used throughout AR4 to their knowledge of a (frequently cited) ambition to limit warming to “2 oC or less above pre-industrial temperatures”. It may be too late to gain overall consistency right across AR4 at this stage, but obviously the Synthesis would be the best place to attempt it. (Pat Finnegan, Grian)	Accepted.
SPM-1009	E-SPM-614	A	8				Tab SPM-1: is incomprehensible for policymakers as it is presented. They need a relation between warming and CO2 concentration because they will have to take decisions on energy. Corresponding CO2 concentrations and CO2-equivalent concentrations must be introduced here (as it is in Tab SPM-3 page 18) or in the Box on scenarios which can be presented as examples of each category. And there is a problem regarding coherence between future temperatures mentioned in the tables: in SPM-1 they are relative to 1980-1999 and in SPM-3 with pre-industrial period. Policymakers will be confused if reference levels are different.	Rejected. Approved WGI SPM table. Projections also take account of aerosols and forcing history, so only giving emissions or concentrations in 2100 would be misleading. Footnote added to give preindustrial temperature offset.

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							(Annick Douguédroit, Université de Provence)	
SPM-1010	E-SPM-615	A	8				Scenarios not defined, thus the need for introductory box described in comment 2 [TSU note: See comment E-SPM-207-A]. (Robert Molinari, University of Miami)	Accepted. Box added to longer report. Space limitations prevent addition of box to SPM. References added to topic 3 in SPM.
SPM-1011	E-SPM-616	A	8				Consideration ought to be given to eliminating the SLR column in Table SPM-1 for the reasons stated in my comment on p. line 17: Highlighting numerical values with an inadequate explanation of uncertainty is misleading because numbers lead to the well-known phenomenon of "anchoring". (Michael Oppenheimer, Princeton University)	Rejected. Approved WGI SPM table and relevant information.
SPM-1012	G-SPM-342	A	8				Table SPM-1: For clarity reasons also harmonise the terminology with those in Table SPM-3. One should translate all temperature changes to pre-industrial levels. Ideally emissions, concentration levels and impacts would be visualised in comparable figures and can be integrated with figure SPM-5. (Government of European Community)	Footnote added to give preindustrial temperature offset.
SPM-1013	G-SPM-343	A	8				table SPM-1: "Model-based range excluding future rapid dynamical changes in ice flow" should be explained somehow in the text or in a footnote, because a non-professional reader most probably will not be able to guess about what ice flow the authors talk about. There is something in the text (page 8, lines 20-22) about ice sheet flows, but this is not sufficient for policymakers and the public (this is the SPM!). (Government of Russian Federation)	Taken into account. Text that accompanies the table has been modified.
SPM-1014	G-SPM-344	A	8				Table SPM-1. Could the table also include the respective GHG emissions in 2100 for each scenario? (Government of Norway)	Rejected. Emissions in 2100 are not meaningful to explain warming under each scenario. Figure added to topic 3 showing the SRES emissions.
SPM-1015	G-SPM-345	A	8				Table SPM-1 comment: Given the caveats, the sea-level data given in this table is of little use to policymakers. We suggest it should be omitted, to avoid it being mis-used. The text below (p8 lines 17-22) could stay. The data is still available in the full SYR and of course in the WG reports, but it is more likely those who go looking for it there will appreciate the caveats. (Government of New Zealand)	Rejected. Approved WGI SPM table and important information.
SPM-1016	G-SPM-346	A	8				Table SPM 1. The box describing the scenarios which is included in each of the three WG SPMs should be included in the present SPM as well. Alternatively, a footnote such as	Taken into account. Footnote pointing to more information in

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							note 2, topic 3, page 1, line 11 could be included (Government of France)	longer report has been added.
SPM-1017	G-SPM-347	A	8				Please change table title by replacing the first word “Projected” with “Model-based projections of...” (Government of United States)	Rejected. Projections are a combination of model based information and human judgement for temperature and are only model-based ranges for SLR as noted in the table.
SPM-1018	G-SPM-348	A	8				In the notes associated with Table SPM-1, include routing info to get the reader to the scenario definitions for the scenarios (presumably the glossary). (Government of United States)	Taken into account. Footnote pointing to more information in longer report has been added.
SPM-1019	G-SPM-349	A	8				In Table SPM-1, consider changing “excluding future rapid dynamical changes” to “excluding potential future rapid dynamical change”. Otherwise, it could suggest that they are excluded because they aren’t likely to happen. Also, why is the sea-level rise estimate from constant year 2000 concentrations “NA”? (Government of United States)	Rejected. Approved WGI SPM table. The words do not imply that rapid ice flow will not happen. NA changed to Not Available.
SPM-1020	G-SPM-350	A	8				For Table SPM-1, a column for the 2030s to show that all scenarios are similar (WG1 Table 10.5: for 2011-2030, A2 = 0.64C, A1B = 0.69C, B1=0.66C) would be useful. This is an important result that should be included. Also please replace likely in the table headers with “66%-confidence”. (Government of United States)	Rejected. Suggested text contains the same information i.e. 0.2□ per decade. Assessed ranges for other time periods are not available from WGI. Likely mean 66% or greater.
SPM-1021	G-SPM-25	B	8				We have a major concern that the risks associated with sea level rise are not well treated. Much is made of the effects of thermal expansion but the potentially greater threat of polar ice sheet melt is somewhat eclipsed. For example we note that paleo data suggest that when Arctic temperatures were 3-5C above current levels in the previous interglacial sea levels were 4-6m higher than today. It appears that the Arctic is warming at twice the global rate so one could argue that these levels of sea level rise may be possible for temperatures in the range 1.5 to 2.5C approximately. This suggests a far greater risk of sea level rise than is suggested in the table and is hard to relate to the statement that the Greenland ice sheet will start to lose net mass between 1.9 and 4.6C globally. Additionally recent work shows that previous assessments of the rate of ice flow (especially with respect to flow from beneath and at the front, ocean-facing, leading edge of ice sheets) are likely to be underestimates. This is implied on page10, line8, but the potential strength and implications of these possible rate changes are not clearly given. (Government of United Kingdom)	This table is for 2100. Comment is relevant for longer term sea level rise, which is discussed later. Text underneath the table has been modified to better express uncertainties and resulting caveats about model projections. Furthermore the use of past climates as a analog for future changes is very difficult.

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SPM-1022	G-SPM-26	B	8				Pg 8 - Table SPM-1 (sea level rise) – this states in lines 21/22 that it is difficult to set an upper bound on the degree of rise, but makes no mention of empirical data on the rate of rise due to melting ice sheets. (Government of United Kingdom)	Empirical data are described in detail in topic 1. Revised text also clarifies inclusion of observed ice flow rates in model projections.
SPM-1023	G-SPM-27	B	8				It would be helpful to focus information on sea level rise into one area of the document. Currently the reader gets sea level information in pp8 and 10, which makes it read a bit patchily. A cross reference to a fuller discussion on sea level rise could be made here. (Government of United Kingdom)	Taken into account. Long-term (beyond 2100) projections are now presented together with the risk of (longer-term) abrupt changes.
SPM-1024	E-SPM-617	A	9	1	9	9	The figure for the projections of surface temperature, in particular the curve for year 2000 constant concentrations, is very misleading--and that curve should be dropped from the report. Basically, to keep the greenhouse gas emissions constant would require a very substantial cut in emissions (80-90% or so)--this would lead to a sharp reduction in SO2 emissions and so a sharp drop in sulfate concentrations. Yet, these calculations were done with constant sulfate concentrations. This is a purely imaginary case, virtually impossible to ever realize. If you want to show the change in temperature if we went to zero emissions, then that would be interesting--showing how the temperature would coast up before starting to drop, but the line for constant concentrations here does not show that--it is simply an impossible case and of no use to policymakers--or even worse, of negative use. (Michael MacCracken, Climate Institute)	Reject: This is an essential physics test; no indication is given that this would be a realistic scenario.
SPM-1025	G-SPM-28	B	9	1	13	47	Pgs 9-13 We suggest it may be easier to draw out of these paragraphs material that would fit in a separate section on the longer term risks of climate change (as proposed above). This could include, inter alia, a fuller discussion on the risks of sea level rise. (Government of United Kingdom)	Taken into account. Long-term (beyond 2100) projections are now presented together with the risk of (longer-term) abrupt changes.
SPM-1026	G-SPM-351	A	9	1			Figure SPM-5: This figure doesn't show the full range of warming for years between 2000 and 2100. The bars in the middle of the figure apply to 2100 (not explicitly stated), but most stakeholders need equivalent ranges of uncertainty for other years, e.g. 2020, 2050, 2080. This information can be derived from WGI Ch 10 and could be considered for inclusion. (Government of Australia)	Likely range has only been assessed for 2100. No assessed uncertainty ranges for other time periods is available.
SPM-1027	G-SPM-352	A	9	1			Figure SPM-5: It is assumed that the authors have changed this figure from that used in the body of the SYR due to space constraints. The authors need, however, to state that the use of the A1B scenario is for illustrative purposes only and explain why A1B was chosen. The authors should also note that projected surface temperatures for 2020-2029 and A2 and B1 are included in SYR Fig 3.1. (Government of Australia)	As stated in the text geographical distributions are similar. The map illustrates the geographic pattern.

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SPM-1028	G-SPM-353	A	9	4	9	4	We propose that the text does not refer to colors in the figure. This is in order to facilitate the reading for those printing without colors. (Government of Norway)	Rejected. Colors can help communicate. But the figure is intelligible in black and white.
SPM-1029	E-SPM-618	A	9	6	9	6	Presumably the bars in the middle of the figure refer to the 2090-2099 mean? The caption doesn't say (Keith Shine, University of Reading)	Accepted. Caption modified.
SPM-1030	E-SPM-620	A	9	12	9	12	"There is now higher confidence in..." compared to the last report? Since a specific study? (Katherine Casey Delhotal, RTI International)	Same wording as in WGI SPM. 'Now' makes it clear that it is compared to previous assessments.
SPM-1031	E-SPM-621	A	9	12	9	12	"Higher confidence" -- higher than what? Than in the previous assessment? Needs clarification. (Noel Gurwick, Carnegie Institution)	Same wording as in WGI SPM. 'Now' makes it clear that it is compared to previous assessments.
SPM-1032	G-SPM-27	C	9	12	9	12	'There is higher confidence ... add: since the TAR (Government of Belgium)	Same wording as in WGI SPM. 'Now' makes it clear that it is compared to previous assessments.
SPM-1033	E-SPM-619	A	9	12	9	28	The meat of this section is all in the bullets. None of the strength of that message makes it into the boldfaced sentence that begins the section. I recommend modifying the subheading to reflect the important points in the bullets more clearly. (Noel Gurwick, Carnegie Institution)	Rejected. No specific suggestion. Heading is consistent with WGI SPM.
SPM-1034	E-SPM-622	A	9	13	9	14	What is "some aspects of ices" known? Fast-flowing ice from the ice sheets are excluded for the estimate of sea-level rise because of the lack of sufficient knowledge. However, here some aspects of ice is known, the report said. It sounds tricky for me. Explain what aspects of ice is known here. For example, continental-wide summer melting of the Greenland ice sheet. (Kenichi Matsuoka, University of Washington)	Noted. Text modified. The text means sea ice.
SPM-1035	E-SPM-623	A	9	13	9	14	Style insentence '...in winds patterns, precipitation, and some aspects of extremes AND OF ice' (Michel Rixen, NATO Undersea Research Center)	Not clear what comment means – no change suggested. Text modified. The text means sea ice.
SPM-1036	E-SPM-624	A	9	14	9	14	To replace "extremes and of ice" with "extreme and of ice phenomena" (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Noted. Text modified. The text means sea ice
SPM-1037	G-SPM-354	A	9	14			Adding "..., and some aspects of extreme WEATHER EVENTS and of ice." might make this sentence more easy to understand. (Government of Norway)	Rejected. Approved language of WGI SPM. Not only weather extremes are described.

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SPM-1038	G-SPM-356	A	9	16	9	21	The authors should make consistent use of likelihood findings for each of the bullet points. (Government of Australia)	Rejected. Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels.
SPM-1039	E-SPM-626	A	9	16	9	23	Can any confidence/likelihood statements be associated with these statements? Not including them with these statements, but with others, raises the question of confidence. (Roger Street, UKCIP-OUCE)	Rejected. Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels.
SPM-1040	E-SPM-625	A	9	16	9	28	Shall we mention the likelihood of more frequent and intense ENSO system dynamics? (Germán Poveda, Universidad Nacional de Colombia)	Rejected: No clear information available on changes in ENSO
SPM-1041	G-SPM-355	A	9	16	9	28	This bullet list lacks the statement that "Heavy precipitation events are very likely to increase in most areas". [WG1 Table SPM.2] (Government of European Community)	Rejected. Already stated in the 5 th bullet (moved to 3 rd bullet in revised text).
SPM-1042	G-SPM-357	A	9	16	9	28	It is not good to have a mixed set of statements with and without likelihood and confidence levels. All the statements should have some parallel confidence or certainty statement or be dropped. The "less confidence" assessment on cyclone numbers (line 25) seems to revert to a vernacular use rather than the formal, defined confidence levels adopted here. Please give it a formal assessed level. Also, please give specific region(s) for cyclones and other phenomena since the changes are limited to one or two regions. (Government of United States)	Rejected. Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels. Projected increases in cyclone intensity are not constrained to only one or two regions (confusion with observation and attribution).
SPM-1043	G-SPM-28	C	9	16	9	28	" Explain why these examples have been chosen (footnote)" (Government of Belgium)	Rejected. Space limitations. Selected for significance. WGI SPM language.
SPM-1044	E-SPM-627	A	9	17	9	23	These four bullets do not have likelihoods or confidence statements, although the subsequent bullets do. Such statements should be added. (Elizabeth L Malone, Pacific Northwest National Laboratory)	Rejected. Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels.
SPM-1045	E-SPM-629	A	9	17	9	23	The first four bullets don't use the phrase "very likely", or "likely" which seems odd since they are talking about projected changes. (Katherine Casey Delhotal, RTI International)	Rejected. Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific

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								likelihood levels.
SPM-1046	E-SPM-628	A	9	17	9	28	The level of confidence on the first four bullets is not stated -- does that mean these statements are certain? (Mustafa Babiker, Saudi Aramco)	Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels.
SPM-1047	G-SPM-358	A	9	17	9	28	there is an unbalanced assessment of confidence. In particular, the level of confidence on the statements on the first four bullets is not stated – does that imply that these statements are certain? (Government of Kingdom of Saudi Arabia)	Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels.
SPM-1048	G-SPM-359	A	9	17	9	28	Please be consistent in the formulation, either include likelihood for each bullet or remove from the last three bullets (Government of Sweden)	Rejected. Approved language of WGI SPM has been used consistently. Not all statements have been assessed to specific likelihood levels.
SPM-1049	G-SPM-360	A	9	17	9	28	Except for the disappearance of summer sea ice quoted on lines 18-20, the order of magnitude of the projected phenomena is not given. Orders of magnitude for some periods and some scenarios are necessary to convince the readers that the problems are real. "Very likely increase of hot extremes" carries less information than writing that the presently hot summers, such as 2003 in western Europe, will be cool summers in 2100, under the A2 scenario (Government of France)	Rejected. Approved language of WGI SPM and space limitations.
SPM-1050	E-SPM-630	A	9	18	9	20	It needs to be mentioned that the disappearance of late-summer season sea ice could occur before the latter part of the 21st century--the observations are changing faster than even some of the warmest models. As phrased, this finding is seriously underestimating the potential for change. (Michael MacCracken, Climate Institute)	Rejected. Not based consistent with WGI AR4.
SPM-1051	E-SPM-631	A	9	18	9	20	I would suggest you separate out snow cover reduction as one bullet and the sea ice summer minimum extent as a separate bullet. The reduction of sea ice is a clear and significant concern of the Arctic response to global climate change and should be highlighted as a separate bullet. (David Barber, University of Manitoba)	Noted. Due to space limits all cryospheric changes are now included in one bullet.
SPM-1052	G-SPM-361	A	9	18	9	20	This bullet is awkward to read. Suggest the following rephrasing: ".....almost COMPLETE disappearance of late-summer sea ice IN THE ARCTIC by the latter part.....projections.	Text revised.

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							Also, delete the last few words of current sentence - 'using SRES scenarios' - not needed. (Government of Canada)	
SPM-1053	G-SPM-362	A	9	18	9	20	“Contraction of snow cover and sea ice; almost entire disappearance of Arctic late summer sea ice by the latter part of the 21st century in some projections using SRES scenarios” - it would much better (and balanced) to present the range of the contraction across the models and scenarios used. (Government of Russian Federation)	Rejected. Approved language of WGI SPM and space limitations.
SPM-1054	G-SPM-363	A	9	19	9	19	The statement “some projections” is confusing. Is it some models with all SRES, or all models with some SRES? What is the confidence/certainty level is assessed? (Government of United States)	Some models with some scenarios. Insufficient space to give more detail.
SPM-1055	E-SPM-632	A	9	21	9	21	Suggest rewording of sentence: "Increased thaw depth in permafrost regions" (this is similar to wording in longer report and also more correct terminology) (Sharon Smith, Geological Survey of Canada)	Accepted.
SPM-1056	E-SPM-633	A	9	21	9	21	Permafrost thaw depth is an ambiguous term. I assume this means increased depth of the active layer. In general this parameter is determined primarily by summer conditions of temperature and insulation and shows limited correlation with annual air temperature. In general warmer conditions give a stronger temperature gradient between summer air temperature and permafrost, but drier surface soils with reduced thermal conductance. I'm not sure the thermal conductance is included in the models. What might be most relevant to policy makers would be decreased areal extent of permafrost. Permafrost temperature would increase and the thickness of the permafrost layer would decrease, but policy makers might not care about this. (F. Stuart Chapin, III, University of Alaska Fairbanks)	Noted. Text modified.
SPM-1057	E-SPM-635	A	9	21	9	21	"increased...depth" is confusing. How about "Deeper permafrost thaw" or even "Deepening permafrost thaw"? (Elizabeth L Malone, Pacific Northwest National Laboratory)	Noted. Text modified.
SPM-1058	G-SPM-364	A	9	21	9	21	What does “higher confidence” mean? Does it mean we now have high confidence or does it mean that while higher, our confidence is still relatively low? Without such context, it is difficult to gauge of the overall significance of the regional-scale model projections that follow. (Government of United States)	Rejected. Wording is from approved WGI SPM.
SPM-1059	G-SPM-365	A	9	21	9	21	Suggest rewording of sentence to use more correct terminology. "Increased thaw depth in permafrost regions." (Government of Canada)	Accepted.

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SPM-1060	E-SPM-634	A	9	21			Need include reference to coastal erosion, particularly in the Mediterranean and tropical zones. (Magdalena Muir, Environmental and Legal Services Ltd.)	Reject. Not relevant in this part of the text.
SPM-1061	G-SPM-366	A	9	22	9	23	These bullets are ordered differently from the WG1 SPM. Is there a reason behind the reordering? If not, it seems logical to keep the same order. (Government of United States)	Bullets have been re-ordered.
SPM-1062	E-SPM-636	A	9	24	9	24	what is the difference between a "hot extreme" and a "heat wave"? Literature on health impacts from extreme heat suggests that this is a very important differentiation - health impacts rise exponentially as duration of extreme heat increases. (Peter Berry, Health Canada)	Approved WGI SPM language and standard terminology
SPM-1063	E-SPM-637	A	9	25	9	26	This suggestion that cyclone number could decrease is, I believe from only one model--that is hardly the basis for saying anything here other than we are uncertain--we simply don't know. IPCC was very careful before coming to a conclusion on the MSU-surface issues, it should be equally cautious here. At the very least, if the point is going to be made, then add in that it is likely that total hurricane destructive power and the intensity of precipitation are likely to increase--we have far better information on this, and yet those points are not made. (Michael MacCracken, Climate Institute)	Rejected. Important for balance to state that total cyclone numbers could decrease. This part does not evaluate their impact. Different confidence levels are stated.
SPM-1064	E-SPM-640	A	9	25	9	26	"Less confidence in decreasing cyclone numbers." Less confidence compared to what? The first statement provides a likelihood statement, so it is not clear what the comparison being made here is. (Michael Mastrandrea, Stanford University)	Approved WGI SPM language. 'Less' is obvious in this context, less confidence that in the projected increase in intensity.
SPM-1065	G-SPM-367	A	9	25	9	26	Please add after "intensity": "with larger peak wind speeds and more heavy precipitation associated with ongoing increase of tropical SSTs." . Also, add "global" in front of "decreasing cyclone numbers" (Government of Germany)	Rejected due to space limitations.
SPM-2134	G-SPM-4	D	9	25	9	26	On cyclones. There is no confidence in decreasing cyclone numbers. This entails that cyclone numbers are currently high: But in lines 14-15 of page 4 it is stated that '[T]here is no clear trend in the annual number of tropical cyclones' Is there not a contradiction here? (Government of Argentina)	There is no contradiction: "less confidence" is relative to the likelihood of the increase in tropical cyclone intensity.
SPM-1066	E-SPM-638	A	9	25			Replacing "less confidence in decreasing cyclone numbers" by "possible decrease in cyclone numbers" would result in more readable text. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Rejected. Approved WGI SPM language.
SPM-1067	E-SPM-639	A	9	25			change 'less confidence' to 'much less confidence' (M. James C. Crabbe, University of Bedfordshire)	Rejected. Approved WGI SPM language.

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SPM-1068	E-SPM-644	A	9	27	9	27	"increases at high latitudes". (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Noted. Editorial.
SPM-1069	E-SPM-641	A	9	27	9	28	Why is there no mention of tropical areas? If one were to use the same reasoning in these lines for the high-latitudes and most sub-tropical land regions continuing observed patterns in recent trends, can't there be a statement for either increases/decreases in tropical land areas where the observed patterns could continue, as in the case of those where El Ninos have been causing decreases in rainfall (particularly if there will be more El Nino-mean like trend)? (Lourdes Tibig, Philippine Atmospheric, Geophysical and Astronomical Services Administration)	Only "very likely" and "likely" changes are mentioned (Topic 3, WG1 SPM). No consistent pattern across all tropics.
SPM-1070	E-SPM-642	A	9	27	9	28	Insert Figure 3.3 here as part of the SPM - I cannot believe you left this out. This is the figure that should be ringing alarm bells! (Tom Crowley, Duke University)	Rejected due to space limitations. Also, this annual mean runoff figure can be misleading and needs too much explanation which cannot fit here.
SPM-1071	E-SPM-643	A	9	27	9	28	I do not think that this statement is consistent with p. 6., l. 21 (Rolf Mueller, Research Centre Juelich)	No contradiction identified. Rejected as no specific suggestion is made. These are future projections. The discussion on page 6 involves the historical changes.
SPM-1072	G-SPM-368	A	9	30	7	32	The scientific expression is correct but it would be better for policymakers to use also words making reference to the "inertia of the climate system" as they are mentioned in page 17 to 18 (Government of Switzerland)	Rejected. Approved WGI SPM language. The inertia seems clear in the wording used.
SPM-1073	E-SPM-645	A	9	30	9	32	This sentence would read much more easily if taken out of the conjunctive: replace the first "would" with "will likely" or "are expected to" and the "were to be" with "are". (Mark Lawrence, Max Planck Institute for Chemistry)	Rejected. Approved WGI SPM language.
SPM-1074	E-SPM-646	A	9	30	9	32	The text here jumps straight from emissions to concentrations without explaining the connection between these. It would help if the reductions in emissions required to stabilise concentrations of individual GHGs were shown in the report. (Archie McCulloch, University of Bristol)	Rejected due to space limitations. The emissions required for stabilisation of concentrations are discussed in detail later.
SPM-1075	E-SPM-648	A	9	30	9	32	Feedbacks should be elaborated more. (Motoyoshi Ikeda, Hokkaido University)	Rejected due to space limitations. No specific suggestion made.
SPM-1076	G-SPM-370	A	9	30	9	32	This heading seems misplaced. It seems that it would be more effective earlier in the text. (Government of Japan)	Noted. Section moved to later place where it provides more consistent flow of messages and

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								puts the longer term changes next to the abrupt change discussion.
SPM-1077	G-SPM-29	B	9	30	9	32	Suggest redraft for clarity "Anthropogenic warming and sea-level rise would continue for centuries even if greenhouse gas concentrations were to be stabilised, due to timescales and feedbacks associated with climate processes." (Government of United Kingdom)	Rejected. Approved WGI SPM language.
SPM-1078	E-SPM-647	A	9	30	9	37	Including this text here, in that it seems to relate to the left panel of figure SPM-5, needs to be very carefully done as that figure is very misleading (a point made in a separate comment). It needs to be made clear in the text that stabilization of greenhouse gas concentrations will mean much less sulfate aerosol, and so this will exert a strong warming influence. (Michael MacCracken, Climate Institute)	Text moved. Stabilization issues discussed later in the text.
SPM-1079	G-SPM-369	A	9	30			Since this might not be obvious to non-scientists, the inclusion of some rationale for this statement (in the heading or the underlying text) might be useful. This could, for example, read: "If greenhouse gas concentrations were to be stabilised at a given level, it will take time before global air and sea temperatures, as well as the effects of these changes, will stabilize at a new equilibrium level. Thus both warming and sea level rise would continue long after the concentrations have been stabilized." (Government of Norway)	Rejected due to space limitations. The text seems clear.
SPM-1080	E-SPM-651	A	9	34	9	34	The choice of stabilisation at 850ppm is by far away from everything which is close to fulfil Art 2 of UNFCCC. Why not choosing a more realistic number for an example on the inertia? (Manfred Treber, Germanwatch)	Text deleted for space reasons.
SPM-1081	E-SPM-653	A	9	34	9	34	Instead of "radiative forcing", non-scientists might easier understand "radiative forcing agents", or "greenhouse gas concentrations". (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Text deleted for space reasons.
SPM-1082	E-SPM-655	A	9	34	9	34	change '850ppm' to '850 ppm' (Suam Kim, Pukyong National University)	Text deleted for space reasons.
SPM-1083	G-SPM-374	A	9	34	9	34	Some qualification of the A1B scenario would be useful: "medium high emissions scenario" (Government of Switzerland)	Text deleted for space reasons.
SPM-1084	E-SPM-649	A	9	34	9	35	This should be rephrased; at present it sounds as if stabilisation causes further warming. How about "Even if radiative forcing is stabilised in 2100 at A1B levels (approximately 850 ppm CO2-equivalent), the world would warm about an additional 0.5..."? (Elizabeth L Malone, Pacific Northwest National Laboratory)	Text deleted for space reasons.

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SPM-1085	G-SPM-373	A	9	34	9	35	The parenthetical comment could be misleading. Wouldn't stabilization at other levels, under other scenarios, also lead to significant further warming? (Government of United States)	Text deleted for space reasons.
SPM-1086	E-SPM-650	A	9	34	9	37	This is very similar to material in the section on mitigation and adaptation. Again, the entire document needs to be better organized so that ideas do not get repeated in slightly modified forms several pages after they are initially introduced. (Noel Gurwick, Carnegie Institution)	Text deleted for space reasons.
SPM-1087	E-SPM-654	A	9	34	9	37	delete lines (Hugo Beltrami, St. Francis Xavier University)	Accepted..
SPM-1088	G-SPM-372	A	9	34	9	37	This paragraph, about additional warming and SLR beyond 2100, is very misleading as it reads as though this conclusion only applies to scenario A1B. Both the WGI SPM and Technical Summary make it clear this conclusion is more broadly applicable, and applies at least to B1 and A1B and while A1B has a CO ₂ -eq conc of 850 ppm, B1 has a CO ₂ -eq of only 600 ppm. This is important information for policymakers that additional warming of half a degree or more is expected even with more stringent emission paths. We suggest using the clearer wording of WG1-SPM, page 17, lines 2 and 3 but would encourage addition of the CO ₂ -eq concs. for the B1 and A1B scenarios. (Suggested lines are: "If radiative forcing were to be stabilized in 2100 at B1 (approximately 600ppm CO ₂ -equivalent) or A1B (about 850ppm CO ₂ - equivalent) levels a further increase in global average temperature of about 0.5°C would still be expected, mostly by 2200. If radiative forcing were to be stabilized in 2100 at A1B levels, thermal expansion alone would lead to 0.3 to 0.8 m of sea level rise by 2300 (relative to 1980–1999)." (Government of Canada)	Text deleted for space reasons.
SPM-1089	G-SPM-375	A	9	34	9	37	Should this not be expressed more generally, the fact that even if GHG concentrations are stabilised, impacts will continue for centuries? If the sentence would remain it could be useful to specify if thermal expansion occurs on top of 2100 levels (Government of European Community)	Text deleted for space reasons. This point is covered in the section based on topic 5.
SPM-1090	G-SPM-30	B	9	34	9	37	Pg 9 lines 34-37 with table SPM 3 on pg 18 - It is hard to interpret text on pg 9 with the table to establish easily what this means in terms of stabilisation as we normally discuss it as opposed to stabilisation at equilibrium. The timescales seem to be much longer, but it is not clear. Lines 34-37 on pg 9 are almost completely incomprehensible. (Government of United Kingdom)	Text deleted for space reasons.
SPM-1091	E-SPM-652	A	9	34			Separate 'ppm' from '850' (Javier Martin-Vide, Group of Climatology)	Text deleted for space reasons.
SPM-1092	G-SPM-371	A	9	34			We think that a reference to percent of present or pre-industrial levels (instead of ppm CO ₂ -equivalent) would make this sentence more readable.	Text deleted for space reasons.

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							(Government of Norway)	
SPM-1093	E-SPM-656	A	9	35	9	35	Here it is written about a warming of 0.5 C if radiative forcing is stabilized by 2100, on page 12 line 21 it is written about a warming of 0.6 C if greenhouse gases and aerosols are kept constant at year 2000 levels. This is confusing and needs further short explanation. (Gesa Weyhenmeyer, Environmental Assessment)	Text deleted for space reasons.
SPM-1094	E-SPM-657	A	9	36	9	37	Given the preceding sentence, it could be worthwhile to give the sea level changes relative to 2100. (Perhaps also adding that additional contributions might arise from ice sheet melt.) (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Text deleted for space reasons.
SPM-1095	E-SPM-658	A	9				Figure SPM-5: This figure is not needed as it presents the same data as in Table SPM-1. Also there are some small (0.1 degC) differences between the best estimates and ranges of the SRES scenarios in Figure SPM-5 and Table SPM-1 (columns 2-3). For example: the A1B scenario in Fig. SPM-5 has a best estimate of 2.6 degC whereas in Table SPM-1 the best estimate is given as 2.8 degC. (John R. Porter, University of Copenhagen)	Rejected. This figure is important for the SPM as it shows transient warming over the 21 st century.
SPM-1096	E-SPM-659	A	9				Figure SPM-5 right panel. Confusing colour scale. (Joanna Haigh, Imperial College)	No specific suggestion made; we think the colour scale is clear,
SPM-1097	E-SPM-660	A	9				Fig spm-5, Please add the others surface warming patterns as described in Topic5. (Bangzhong Wang, China Meterological Administration)	Rejected due to space limitations. The point is that all patterns are very similar (point made in text).
SPM-1098	E-SPM-661	A	9				(Figure SPM-5) Explain in Figure caption what grey area around black line in left panel is. (Janice Lough, Australian Institute of Marine Science)	Grey shade deleted
SPM-1099	E-SPM-662	A	9				Figure SPM-5. Are bars relative to year 2100? 2090-2099? (Michel Rixen, NATO Undersea Research Center)	Accepted. Explanation added to the caption.
SPM-1100	G-SPM-376	A	9				This is very important information, especially regarding the comparability with the mitigation scenarios in Table SPM-3 and the temperature ranges in Figure SPM-8. PLEASE CLARIFY THE CONTRADICTION that Figure SPM-5 shows a temperature increase of 3,6°C against pre-industrial for A1B levels by 2100, so 4,1 °C until equilibrium according to line 35, BUT Figure SPM-8 (right panel) shows an increase of almost 4,9°C for 850ppm CO2-eq, which is the A1B level in 2100. SO THERE IS A GAP OF 0,8°C, ALMOST 1 °C!!! Line 35 should then read "further warming of about 1.3°C beyond 2100,...". Please provide also the further warming beyond 2100 for stabilisation at A1FI level in 2100, because A1FI is highly policy relevant with respect to recent global emission trends. (Government of Germany)	Text in line 35 deleted for space reasons. The WGI SPM has a small type-o which leads to a misinterpretation of the results. The WGI Chapter 10 text reads: For the B1 constant composition commitment run, the additional warming after 100 years is also about 0.5°C, and

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								<p>roughly the same for the A1B constant composition commitment (Supplementary Material, Figure S10.3). These new results quantify what was postulated in the TAR in that the warming commitment after stabilising concentrations is about 0.5°C for the first century, and considerably smaller after that, with most of the warming commitment occurring in the first several decades of the 22nd century.</p> <p>Here the chapter 10 authors make it clear that the 0.5C warming occurs by 2200 (in the first 100 years). Additional warming would continue for centuries. We think this eliminates the apparent contradiction noted in the comment. We also note that differences in carbon cycle feedback are expected to be important in comparing different estimates of equilibrium warming.</p> <p>The text is modified in topic 3.</p>
SPM-1101	G-SPM-377	A	9				<p>SPM,p.9, figure SPM-5: Lines for scenarios other than A2, A1B and B1 should be added to the graph. Also, why does the right-side part of this Figure (Surface warming pattern) only show the A1B scenario? Since B1 and A1F1 are the most referred to scenarios (they represent the lowest and highest temperature rise scenarios), they should be added to this Figure. (Government of Japan)</p>	<p>Rejected. The figure has been approved in WGI SPM. Other multi-model scenarios are not available. The simple climate model MAGICC is not a good emulator of the AOGCMs and is not used to generate transient temperature curves.</p>

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SPM-1102	G-SPM-378	A	9				In Figure SPM-5, do the temperature bars associated with the left-hand panel account for the likely range in emissions accounting for different model outputs, uncertainty in climate models (e.g. assumed climate sensitivity, carbon feedbacks, etc.), or both? This should be clarified in the caption or in a footnote. (Government of United States)	The assessed likely range covers known uncertainties across a hierarchy of models; see note to Table SPM-1. Inclusion of carbon cycle is stated in the text.
SPM-1103	G-SPM-379	A	9				Figure SPM-5: Please include curves for all SRES scenarios, in particular A1FI results WITHIN the diagram, analogue to the other SRES-curves, because it is highly policy relevant with respect to recent global emission trends. (Government of Germany)	Rejected. The figure approved in WGI SPM. Other multi-model scenarios are not available. The simple climate model MAGICC is not a good emulator of the AOGCMs and is not used to generate transient temperature curves.
SPM-1104	G-SPM-380	A	9				Figure SPM-5: Please include curve for A1FI results WITHIN the diagram, analogue to the other SRES-curves, because it is highly policy relevant with respect to recent global emission trends. (Government of Germany)	Rejected. The figure approved in WGI SPM. Other multi-model scenarios are not available. The simple climate model MAGICC is not a good emulator of the AOGCMs and is not used to generate transient temperature curves.
SPM-1105	G-SPM-381	A	9				Figure SPM-5. For a layman the negative temperatures in the figure are somewhat surprising. The figure could be clearer, if a thin line at the level of 0.0 degrees were drawn from 1900 to 2100 and the reference time period (1980-99) were clearly marked by thick red line and text. (Government of Finland)	Rejected. The figure approved in WGI SPM. Reference period is an arbitrary choice that should not be elevated as if it were a crucial physical variable.
SPM-1106	G-SPM-382	A	9				Figure SPM5- Right Panel: For better comparison, it would be advisable to add in this panel the graph A1B, 2020-2029 relative to 1980-1999, from Figure SPM6-WG I (Government of Cuba)	Rejected due to space limitations. No difference in pattern (as stated in text).
SPM-1107	G-SPM-383	A	9				Figure SPM-5 comment: The left-hand panel does not add significant new information and should be omitted. (It is retained, the Table SPM-1 should be omitted.) This will also mean four lines can be removed from the caption. The right-hand panel of the figure should be retained.	Rejected. The figure is important, showing transient warming information not contained in Table SPM-1.

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							(Government of New Zealand)	
SPM-1108	G-SPM-384	A	9				Figure SPM.5: The fluctuations in global warming projections are model artefacts, which are not related to fluctuations in forcing nor do they indicate the range of natural (or single-model) variability. For that reason, the fluctuations should be "flattened" out by applying a moving average filter. (Government of European Community)	Rejected. The figure approved in WGI SPM.
SPM-1109	G-SPM-385	A	9				Fig SPM-5: add after 'scenarios': "averaged over the period 2090-2099" (Government of Netherlands)	Suggestion not clear – time range of likely ranges has been clarified (if this is what is meant).
SPM-1110	G-SPM-386	A	9				Fig SPM-5. The figure in the right panel is too small to be read in detail. (Government of Norway)	Noted. It is not meant to be read in detail but only to illustrate the geographic pattern of warming across the globe.
SPM-1111	G-SPM-387	A	9				Fig SPM-5, left panel: The endpoint of the (red) "A2-line" does not correspond to the indicated middle in the S2-uncertainty band at right (Government of Netherlands)	The uncertainty range is computed for the 10-yr period preceding the line endpoint date as noted in the caption. WGI SPM figure.
SPM-1112	G-SPM-31	B	9				Figure SPM-5. We note that this is reproduced from WG1. However we consider that it is misleading because the full range of SRES marker scenarios are not shown. We urge you to consider adding these based on simpler models, suitably tuned to the GCM range, with appropriate annotation that this has been done. (Government of United Kingdom)	Rejected. The WGI SPM figure approved by governments. Inappropriate to mix SCM results with multi-model AOGCM simulations. The simple climate model MAGICC is not a good emulator of the AOGCMs and is not used to generate transient temperature curves. See WGI 10.A.1
SPM-1113	G-SPM-29	C	9				Please add a map showing changes in water runoff or water stress, drawing on figures SYR 3.2 and 3.3, and also WG2 figures eg TS5, 3.2, 3.4 and 3.5. Such a map was also proposed for WG2 SPM and when discussed in plenary was considered very useful by a large number of delegates.	Rejected due to space limitations. Also, this annual mean runoff figure can be misleading and

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							Concerns were raised regarding extreme values in a number of countries in the Sahel region, in India, and the Middle East. Figure SYR 3.3 partly resolves that problem by removing data where the agreement between models is low. An alternative figure from WG1 chap10 (similar source as SYR 3.2 but for runoff, showing changes in mm/day) was also considered, but could not be accepted in WG2 SPM as it came from WG1 (not an issue for SYR). To add more information about impacts, we also discussed superimposing boxes as in WG2 fig TS5. It was considered that those specific boxes were not necessarily the most important/representative examples for each region, and introducing them during the last hours in plenary would have led to too much debate, however the concept was good and there is now time to reconsider a figure with such example boxes for the SYR. (Government of Belgium)	needs too much explanation which cannot fit here.
SPM-1114	E-SPM-669	A	10	1	10	1	I think it is necessary a history explanation why Greenland' s name and not Whiteland name. In what time was greenland? (Dionisio Rodriguez Alvarez, Xunta de Galicia)	Rejected as not relevant for the SPM.
SPM-1115	G-SPM-388	A	10	1	10	1	Use the world "melting" instead of "contraction" of the Greenland ice sheet (Government of Switzerland)	Rejected. Approved WGI SPM language.
SPM-1116	E-SPM-668	A	10	1	10	2	Nothing has been said about the Greenland ice sheet contributing to sea level rise between the present and 2100 - the phrasing here suggests that it has. Perhaps replace with 'for many centuries' or something similar. (Nathan Gillett, University of East Anglia)	Taken into account. In the modified text, the point is mentioned following table SPM-1.
SPM-1117	E-SPM-663	A	10	1	10	4	While the models may suggest that it may take millennia for the change, it is admitted that the models are missing some very important physics. If we instead look to the situation in the Eemian, what we see is that a rise in global average temperature of only about 1 C led to a 4-6 m rise in sea level in a quite short time. We are also seeing evidence of more rapid deterioration of parts of the large ice sheets than we can explain--so we really need to say that this "millennia" timescale estimate has very low confidence--and things could well occur more rapidly. (Michael MacCracken, Climate Institute)	This point is covered under the headline on abrupt or irreversible changes, which now follows immediately after the section on millennial scale projections. Furthermore, the use of past climate as a analog for future changes is very difficult.
SPM-1118	E-SPM-664	A	10	1	10	4	This is very closely related to the section that refers to table SPM-3 under the mitigation and adaptation section. The two should be combined. (Noel Gurwick, Carnegie Institution)	Rejected. Mitigation and adaptation section is concerned with stabilisation scenarios, which are not considered here.
SPM-1119	E-SPM-665	A	10	1	10	4	This description is very serious and important for discussion of anthropogenic dangerous interference with climate system. However, there is an argument for the assumption, " if global warming were sustained for millennia. Because there will be a possibility of exhausted fossil fuel for millennia, I recommend some appropriate comment should be added after last line.	Rejected. Use of the word 'if' makes clear it is based on an assumption. Insufficient information on overshoot

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							(Koki Maruyama, Central Research Institute of Electric Power Industry (CRIEPI))	scenarios in underlying reports,
SPM-1120	E-SPM-666	A	10	1	10	4	The statements do not capture the information given in lines 2 to 5 and lines 7 to 10 of page 6, Topic 3. (Lourdes Tibig, Philippine Atmospheric, Geophysical and Astronomical Services Administration)	No specific suggestion for change made. Text has been modified.
SPM-1121	G-SPM-391	A	10	1	10	4	How large the confidence supporting these statements? (Government of Kingdom of Saudi Arabia)	Statement reports model simulations. No assessment has been made of likelihood due to insufficient information. WGI SPM language.
SPM-1122	E-SPM-667	A	10	1	10	8	The entire ice sheet discussion suffers from severe fragmentation. The statement on Greenland presents results from model projections only. The statement on Antarctica similarly reflects model outcomes. It is important to inform the reader at this point that there are two other sources of information: paleoclimate studies and recent observations of changes in both ice sheets. One of these, recent observations, casts into question the phrase "for millennia" and leads to the more capacious assessment in the WGII SPM that a substantial sea level rise from polar ice may occur in "centuries to millennia". I suggest giving a fully integrated view of ice sheet assessment in one place by moving the paragraph on p.13 lines 20-23 to the beginning of this section. Alternatively, add a sentence at the end of line 4 stating something similar to p. 13 line 21-22: "However, rapid sea level rise on century time scales cannot be excluded". With regard to Antarctica, there are two shortcomings. First, the "dynamical ice discharge" on line 8 specifically pertains to the sensitivity of the West Antarctic ice sheet (although some commentary in the literature has also mentioned parts of East Antarctica in this regard. It is West Antarctica that is discussed extensively in WGI Chapter 10 and WGII Chapter 19). Accordingly, the vulnerability of the West Antarctic ice sheet and the sea level rise hazard embodied there (~5m) should be specifically mentioned. In fact WAIS is nowhere mentioned in the SYR and that is a major oversight that should be corrected, and here is a good place to start. I suggest altering line 8 to read "However, net loss of ice mass could occur if dynamical ice discharge FROM THE WEST ANTARCTIC ICE SHEET, WHICH CONTAINS ICE EQUIVALENT TO ABOUT 5M OF SEA LEVEL RISE, dominates the ANTARCTIC ice sheet mass balance" (Michael Oppenheimer, Princeton University)	Text revised and re-ordered to reduce fragmentation. No clear basis for threshold of WAIS disintegration, hence it would be misleading to point to the consequences of this disintegration and any such statement would be in conflict with the WGI assessment..
SPM-1123	E-SPM-671	A	10	1	10	8	As noted by WGI, large sea level changes have accompanied relatively modest global mean temperature changes in earth's past climates--for instance, 120m lower 20,000 years ago when the planet was about 5C cooler, and 4-6m higher 120,000 years ago when the planet was 1-2C warmer. A short sentence should therefore be added noting that past sea-level rises appear to have been dominated by ice melting well in excess of thermal expansion. Space could be saved by deleting duplicate material here and on pg 17 line 27-32.	Noted. Specific discussion is difficult for space limitation. Paleoclimatic evidence is mentioned in the revised text.

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							(Steven Sherwood, Yale University)	
SPM-1124	G-SPM-389	A	10	1	10	8	These two paragraphs are about the Greenland Ice Sheet (lines 1-4) and the Antarctic Ice Sheet (line 6-8). The issue of how changes in ice sheet dynamics may effect future SLR is applicable to both ice sheets, not only to the Antarctic ice sheet, but it is only discussed in the second paragraph. Suggest either adding a line about dynamics to paragraph one on the GIS or restructuring these paragraphs so that the first paragraph deals with the melting of the ice sheets (in which case just move the one sentence on lines 6-7 up to the end of line 4), and the second paragraph addresses the additional uncertainty around changes in dynamics through changes in ice sheet flow rates. (Government of Canada)	Space limitations prevent a fuller discussion. Issue of more rapid change covered in subsequent section on abrupt changes. WGI SPM language
SPM-1125	G-SPM-390	A	10	1	10	8	Suggested text for new paragraph 2 on this page (drawn from TS-47 and using some of the text on existing lines 7-8): "Dynamical processes not included in current models but suggested by recent observations could increase the vulnerability of the ice sheets to warming and future SLR. Therefore, net loss of ice mass could occur for the Antarctic ice sheet as well as the Greenland ice sheet, if dynamical ice discharge were to dominate the ice sheet mass balance. However, understanding of these processes is limited and there is no consensus on their likely magnitude." (Government of Canada)	Space limitations prevent a fuller discussion. Issue of more rapid change covered in subsequent section on abrupt changes.
SPM-1126	E-SPM-670	A	10	1	10	19	delete all lines (Hugo Beltrami, St. Francis Xavier University)	Rejected. No reason given.
SPM-1127	G-SPM-392	A	10	2	10	2	We suggest changing "virtually" to "near" to be more consistent with the wording in Ch.10.7. (Government of Canada)	Rejected. Approved language of WGI SPM.
SPM-1128	E-SPM-672	A	10	2	10	4	This sentence should be reworded to emphasize the less sensationalistic - that is, while the potential elimination of the Greenland Ice Cap is of serious potential magnitude, the fact is that this eventuality is very far off. The SPM should present what is of more immediate threat. Suggest the following change: "Current models do not indicate a complete disappearance of the Greenland Ice Sheet in the next few hundred years, even at elevated warming levels." (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Rejected. Approved language of WGI SPM.
SPM-1129	G-SPM-393	A	10	2	10	4	Rewrite this sentence to make it consistent with Section 3.2.3, page 5, lines 32-37. Suggest the following language: "Contraction of the Greenland ice sheet is projected to continue to contribute to sea-level rise after 2100. Current models suggest that should global average temperature rise over 1.9 to 4.6°C, ice mass losses from increased temperatures will exceed gains from precipitation. If this negative surface mass balance were sustained for millennia, that would lead to virtually complete elimination of the	Rejected. Unnecessary details for SYR SPM. Shorter wording makes same points.

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							Greenland ice sheet and a resulting contribution to sea-level rise of about 7 m.” (Government of United States)	
SPM-1130	G-SPM-395	A	10	2	10	4	Replace " Current models suggest virtually complete elimination of the Greenland ice sheet and a resulting contribution to sea level rise of about 7 m if global average warming were sustained for millennia in excess of 1.9 to 4.6 C relative to pre-industrial values." by "If global average warming were sustained for millennia in excess of 1.9 to 4.6 C relative to pre-industrial values, current models suggest that the Greenland ice sheet will ultimately disappear altogether with a resulting contribution to sea level rise of about 7 m." (Government of Netherlands)	Rejected; current wording closer to that used in WGI SPM.
SPM-1131	G-SPM-394	A	10	2	10	6	Replace "current" with "climate" (Government of Australia)	Rejected. Approved language of WGI SPM.
SPM-1132	G-SPM-396	A	10	2			“Current models suggest virtually complete elimination of the Greenland ice sheet”. It is expedient to add “... during centuries or millennia” for not frightening a reader. (Government of Russian Federation)	Rejected. Approved language of WGI SPM. Millennial time scale is included in current wording.
SPM-1133	E-SPM-673	A	10	4	10	4	Is it really fitting to talk about consequences for millenia? Humans will likely be out of the solar system and concerned with other problems by then. (Mark Lawrence, Max Planck Institute for Chemistry)	Noted – speculation not relevant to climate science. No specific suggestions made.
SPM-1134	G-SPM-397	A	10	4	10	4	This line does not read clearly. To be in excess of a range is confusing. Also, if the range is to be taken as meaningful then it should be the 90% confidence that applies to most ranges (except the sea-level rise of course). Also, if you give a number relative to 1750, then put in perspective since many temperature increases quoted here are from 1980-1999 means. Suggest rephrasing “in excess of about 3°C [1.9 to 4.7°C] relative to pre-industrial values,” recognizing that currently temperatures are about 0.7°C above these values.” (Government of United States)	Rejected. Approved language of WGI SPM. Current knowledge does not allow statement of a best estimate or median temperature.
SPM-1135	G-SPM-398	A	10	4	10	4	It would be informative for a policy maker that the temperature changes are expressed in the same way as in Table SPM-1 to make them comparable (note that this was also suggested for table SPM-1 and SPM-3). (Government of European Community)	The offset between preindustrial and 1980-1999 can only be given in approximate terms; therefore, where specific information is available, it is preferable to stay with the relevant reference period to

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								avoid loss of information. Footnote for the preindustrial temperature offset has been added to table SPM 1.
SPM-1136	G-SPM-399	A	10	4	10	4	add: "Partial melting of polar ice sheets may lead to an enhanced sea level rise of 1m on century time scales". (Government of Netherlands)	Rejected as not supported by the underlying report.
SPM-1137	G-SPM-400	A	10	4	10	4	Add the sentence from [3.3], page 5, lines 37-39 "The corresponding future temperatures in Greenland are comparable to those inferred for the last interglacial period 125,000 years ago, when paleoclimatic information suggests reductions of polar land ice extent and 4 to 6 m of sea level rise". (Government of France)	Accepted.
SPM-1138	E-SPM-674	A	10	6	10	8	timescales required to see those imbalances? Data required to assess it? (Germán Poveda, Universidad Nacional de Colombia)	See WGI AR4 Space limitation hinder adding more here.
SPM-1139	E-SPM-675	A	10	6	10	8	This statement is seriously deficient and does not represent what is happening and could happen. First, only the East Antarctic ice sheet is likely to remain so cold. Second, many of these ice streams are in contact with warming ocean waters and these can lift the ice streams and, as happened with the Larsen-B ice shelf, lead to its rapid loss and the loss of the buttressing of the ice on land above. This phrasing shows no indication that there are serious limits in our modeling of ice streams and does not mention the omitted rapid glacial flow processes that are omitted. (Michael MacCracken, Climate Institute)	Rejected. Approved WGI SPM wording. No specific suggestions made. WGI approved SPM language.
SPM-1140	G-SPM-401	A	10	6	10	8	This is a strong section and its inclusion in the final draft is suggested. (Government of Japan)	Noted. Included in the final draft.
SPM-1141	E-SPM-676	A	10	7	10	8	The sentence spanning these lines needs rewriting. Net loss of ice mass MUST occur if dynamical ice discharge dominates the ice sheet balance. What I think is intended here is a sentence such as "However, there is a risk of net loss of ice mass, as dynamical ice discharge could become large enough to dominate the ice sheet balance." (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Rejected. Approved language of WGI SPM.
SPM-1142	E-SPM-677	A	10	7	10	8	For the sentences starting with "However, net loss..." - provide a confidence statement or drop this sentence. Again, it has a sensationalistic feel to it. (David Atkinson, International Arctic Research Center, University of Alaska Fairbanks)	Rejected. Approved language of WGI SPM.
SPM-1143	G-SPM-402	A	10	7	10	8	Strike this sentence and insert in its place the following to make it more representative of the discussion in Section 3.2.3, page 6: "Net loss of ice mass could occur if dynamical ice discharge dominates the ice sheet mass balance, but our understanding of dynamical processes is limited, and there is no consensus on their magnitude." Also, although our	Rejected. Approved language of WGI SPM. Space limitations prevent more detailed discussion.

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							understanding and ability to model ice sheet dynamics is low, observational evidence for concern exists, and a cogent and clear statement of this tension between observations and models should be made to properly educate the uninitiated reader. (Government of United States)	
SPM-1144	E-SPM-678	A	10	7			Delete "is expected to". The sentence is already talking about something that is projected. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Rejected. The wording is from WGI SPM and appropriate.
SPM-1145	E-SPM-679	A	10	8	10	8	Suggest add at the end of this sentence "as has occurred on the Antarctic Peninsular following the collapse of the Larsen B Ice Shelf" (John Church, CSIRO)	Rejected due to space limitations and because specific example could be misinterpreted to be representative of all ice flow processes, which is not substantiated.
SPM-1146	E-SPM-680	A	10	8	10	8	"dynamical ice discharge dominated the ice sheet mass balance." I am not clear what this means. It is too technical for the summary. (Katherine Casey Delhotal, RTI International)	Rejected. Approved language of WGI SPM. See glossary.
SPM-1147	G-SPM-403	A	10	8	10	8	The authors should consider whether "dynamical ice discharge" is a useful concept for inclusion in the SPM, and if so provide an explanation of the process. (Government of Australia)	This is approved language of WGI SPM. Term added to glossary.
SPM-1148	G-SPM-404	A	10	8	10	8	Is the term ice sheet mass balance fully understandable for policy makers? (Government of European Community)	This is approved language of WGI SPM. Term added to glossary.
SPM-1149	G-SPM-405	A	10	9	10	9	Please add two points: "Dynamical Processes related to ice flow not includes in current models but suggested by recent observations could increase the vulnerability of the ice sheet warming, increasing future sea level rise." and " Both past and future anthropogenic carbon dioxide emissions will continue to contribute to warming and sea level rise for more than a millennium. (Government of Germany)	Rejected due to space limitations. Main points covered in headlines.
SPM-1150	E-SPM-681	A	10	10	10	10	Add: 3.2 Effects on systems, sectors and regions and put off for two lines the rest of the text. (Annick Douguédroit, Université de Provence)	Rejected. Text removed
SPM-1151	G-SPM-32	B	10	10	10	12	This paragraph on difference with TAR should occur earlier, perhaps in the introduction (Government of United Kingdom)	Rejected. Text removed
SPM-1152	G-SPM-406	A	10	10	10	16	This heading is too broad to be useful. Deleting this and replacing it with lines 14-16 as the heading is suggested. (Government of Japan)	Accepted

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SPM-1153	G-SPM-407	A	10	13	10	13	Suggest including a result from WG1 that is of great interest for policymakers and couples with the following paragraph. "Regional projections, including probability distributions for temperature increases, are now available for all continents (see Figure SPM-xx)." Suggest that you use WG1 Figure 11.26. This should be of wide interest to many countries, allowing them to see sub-continental scale specifics. Nothing else in the Synthesis Report gets to the sub-continental scale. (Government of United States)	Rejected due to space limitations.
SPM-1154	E-SPM-682	A	10	14	10	14	To add "IPCC" in respect to "previous assessment" (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Taken into account. Replaced by "TAR"
SPM-1155	G-SPM-408	A	10	16	10	16	One important finding in WG II was that the resilience of many ecosystems will be exceeded and this should be included in the Synthesis SPM. Hence, we propose to include a new sentence from SPM WG II here: "The resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g., flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land use change, pollution, overexploitation of resources)." (page 5 WG II SPM). (Government of Norway)	Rejected due to space limitations. Too specific at this point.
SPM-1156	E-SPM-683	A	10	17	10	19	Please Delete More comprehensive information and some findings on vulnerability and adaptation, can be found in the longer report, including impacts on specific regions. (Bangzhong Wang, China Meterological Administration)	Rejected but wording revised; no reason given for deletion.
SPM-1157	G-SPM-409	A	10	17	10	19	The sentence beginning "More comprehensive information....." seems an odd type of sentence for a Summary for Policymakers, and hardly necessary. Admittedly, some reference to the discussion of impacts on Regions has to be mentioned and readers referred to the underlying reports for that information. Suggest deleting the existing sentence and replacing with the following: "Impacts on specific regions are assessed in the full WGII report." (Government of Canada)	Accepted
SPM-1158	G-SPM-30	C	10	18	10	18	remove coma after 'adaptation'. (Government of Belgium)	Wording revised.
SPM-1159	E-SPM-684	A	10	18	10	19	Need to be more precise as to where within the longer report (and which of the three working group reports) the more comprehensive information and findings can be found. (Roger Street, UKCIP-OUCE)	Wording revised
SPM-1160	E-SPM-685	A	10	19	10	19	Replace "longer" by "underlying" (Andreas Fischlin, Integrative Biology - Systems Ecology)	Wording revised

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SPM-1161	G-SPM-410	A	10	19	10	19	What is meant by “the longer report”? If by this the authors are referring to the Synthesis Report, suggest rewording the sentence to read: “More comprehensive information and some findings on vulnerability and adaptation, including impacts on specific regions, can be found under Topic 3 in this report. {3.3}” (Government of United States)	Wording revised
SPM-1162	G-SPM-411	A	10	19	10	19	Instead of referring to the longer report, would it be informative to insert a figure with a global Map with potential regional impacts? (Government of European Community)	Space limitations prevent this, also very difficult to defensibly condense the richness of information on impacts into a single map; this would very likely lead to significant bias in the selection of impacts.
SPM-1163	G-SPM-412	A	10	19	10	19	Instead of "longer report", specific reference should be provided (Government of India)	Accepted, wording revised.
SPM-1164	G-SPM-413	A	11	0	11	0	This refers to Table SPM-2. The contents of this table were debated extensively in the WGII Plenary and it was decided that the top part included in this table be removed. As a consequence of that, this table in SPM of WGII does not contain the top portion. Accordingly it is strongly felt that the figure given in the upper portion of the Table should be removed. (Government of India)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs.
SPM-1165	E-SPM-687	A	11	1	11	1	The word 'increase' in the third line in top row (WATER) should be 'increased' (Richard Anyah, Rutgers University)	accepted
SPM-1166	G-SPM-414	A	11	1	11	1	Table SPM-2 is misleading. The lower part of the table did not define what time the warming will happen, and no evidence supports this combination. It is suggested to delete the figure above the Table. (Government of China)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs.
SPM-1167	G-SPM-415	A	11	1	11	1	Add a headline above the graph: Key impacts as a function of increasing global average temperature change" (Government of Germany)	Headline added; “key” is not defined however.
SPM-1168	E-SPM-688	A	11	1	11	2	The figure is wrong and does not contain the latest, corrected version from WGII SPM. Note, in section "Ecosystems" that phrase "~40% of ecosystems affected" needs to be shown much more to the right than as this is the case here. (Andreas Fischlin, Integrative Biology - Systems Ecology)	corrected

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SPM-1169	E-SPM-686	A	11	1			What do gray bars represent for? (Kenichi Matsuoka, University of Washington)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1170	E-SPM-689	A	11	1			Comments on the chart: for water, suggest reference to salt water infiltration in depleted and declining aquifers in semi-arid coasts and small islands; coastal erosion being added to the impacts in coasts; and the increasing burden of contaminants and pollution included under health. (Magdalena Muir, Environmental and Legal Services Ltd.)	Rejected; selection of impacts is consistent with those chosen for the WGII SPM.
SPM-1171	E-SPM-690	A	11	2	11	2	I can guess what the bars at the top of the figure mean, but we arent told (Keith Shine, University of Reading)	caption revised
SPM-1172	E-SPM-692	A	11	6	11	6	"dotted arrows indicate impacts continuing *or worsening* with increasing temperature" (add text in **) (Mark Lawrence, Max Planck Institute for Chemistry)	rejected; wording of approved WGII SPM caption used
SPM-1173	E-SPM-691	A	11	6			Change "continuing" to "increasing"? (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	rejected; wording of approved WGII SPM caption used
SPM-1174	E-SPM-693	A	11	7	11	7	"Entries are placed so that the left hand side of text" : isn't it the right hand side? (Nicole Lenotre, BRGM)	no, wording is correct
SPM-1175	E-SPM-694	A	11	8	11	8	"Quantitative entries for water scarcity and flooding... - this also applies to the topic "ecosystems" (Mark Lawrence, Max Planck Institute for Chemistry)	This is more relevant for impacts directly related to human development
SPM-1176	E-SPM-695	A	11	10	11	10	should read adaptation to climate change "impacts" (Peter Berry, Health Canada)	rejected; short form is sufficiently clear and consistent with WGII SPM caption
SPM-1177	G-SPM-416	A	11	11	11	19	We support the introduction of the upper part of the graphic with the global warming. This information is very useful in this context (Government of Switzerland)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1178	E-SPM-696	A	11	13	11	14	"The purple line...2000 values." could be removed (the line seems pink and is described in the legend). Alternatively, the following could be added after "A2, A1B and B1": "..., and for a constant year 2000 concentrations case." (Richard Allan, University of Reading)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.

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SPM-1179	G-SPM-417	A	11	14	11	14	The term "experiment" is misleading to the audience of the SYR. Replace with "simulation". (Government of European Community)	constant concentration experiment deleted
SPM-1180	G-SPM-418	A	11	18			To use two baselines of temperature change might be very confusing for policymakers in spite of the remark.: "To express temperature changes relative to 1850-1899, add about 0.5°C.", so the baselines of temperature change should be unified to pre-industrial period(1850-1899) through the entire SYR. (Government of Japan)	Unification is not possible because the offset to "preindustrial" is only approximate; caption extended to explain, also footnote in Table SPM-1
SPM-1181	E-SPM-697	A	11				Upper part of the table, add « °C » after 1 2 3 4 5 (Annick Douguédroit, Université de Provence)	accepted
SPM-1182	E-SPM-698	A	11				Table SPM-2: This whole piece is slanted towards the negative. Two glaring examples: (1) coral bleaching is stated yet no mention is given that nowhere will it be too hot for corals nor that their range will expand greatly as happened before when the Earth was far warmer, and (2) the hardships of heat are addressed along with all the nastiness imaginable, but what about longer growing seasons, less heating needs, more plantable land, fewer deaths from cold, less energy demand on marine mammals, increased CO2 fertilization and so on. Balance is needed or the agenda becomes clear and leads to discredit of IPCC. As a reality check we need to consider that the Earth has been much warmer before, almost all the present species were present then, people live in the warmest places on the Earth and biodiversity is higher there also, and that human societies have done better when the Earth has been warmer and wetter, rather than cooler. Plants grow poorly in frozen ground or when there are summer frosts. They need CO2 and it is in short supply. (John Everett, Ocean Associates, Inc.)	Rejected; selection of impacts is consistent with impacts selected for WGII SPM; comparison with earlier states is not necessarily meaningful because of changes in urban form and land use, and increased ecosystem fragmentation limiting adaptive capacity of ecosystems in the modern era.
SPM-1183	E-SPM-699	A	11				Table SPM-2: The meaning of the horizontal lines in the top of the upper part of the table is not clear, it should be explained for those who are not familiar with such schemes (Martha Yvette Munguía de Aguilar, Ministry of Environment and Natural Resources)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1184	E-SPM-700	A	11				Table SPM-2: Remove the coloring in the lower part of this table because it's confusing in view of not corresponding with the coloring in the upper part of the table. (Claire Parkinson, NASA Goddard Space Flight Center)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended and colours revised.
SPM-1185	E-SPM-701	A	11				Table SPM-2: it would make more sense to classify it as a Figure. (Marco Mazzotti, ETH Zurich)	accepted, consistent with WGII SPM

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SPM-1186	E-SPM-702	A	11				Table SPM-2: It seems unlikely that one third of ecosystem diversity may face a risk of extinction if temperature raises by 1 degree. This conclusion should be supported by ecosystem vulnerability assessment, which is not provided here. Propose to explain the effects of temperature increase on ecosystems in more details. Otherwise remove this conclusion from the text. (Michael Gytarsky, Institute of Global Climate and Ecology)	this supporting information is found in the underlying WGII report chapter 4
SPM-1187	E-SPM-703	A	11				Table SPM-2: Is this a figure or a table? A very dense figure that needs to be radically simpler to be in the SPM. The most important information is the written material for each of the sectors and how the impacts start and continue for given temperature rises. The upper box should be removed as it repeats earlier information and in the side box it needs to be clear that these numbers refer to sections of the three WG reports. Other comments are: 1. Water; should read 'increased water stress' 2. Ecosystems; write '>40% extinctions' instead of 'significant extinctions' and remove footnote 1. Replace 'net carbon source' with 'net greenhouse gas source'. 3. Coasts; replace 'could experience' with 'experience'. The legend to a simplified SPM-2 needs to reflect such changes. Again the main point is that synthesis is more than 'cut and paste'. (John R. Porter, University of Copenhagen)	renamed to be a figure; wording of impacts follows approved WGII SPM wording
SPM-1188	E-SPM-704	A	11				Table SPM-2: indicate somewhere explicitly (in the caption?) the meaning of the numbers in the box to the right of the bottom panel; also, a small grammar error in the last line of text under the topic "water" in the bottom panel: "...exposed to increased water stress" (rather than "...increase water stress...") (Mark Lawrence, Max Planck Institute for Chemistry)	caption amended and text corrected
SPM-1189	E-SPM-705	A	11				Table SPM-2: Enlarge garphic to fit full page. It might be worth sacrificing point size in the explication in order to gain point size and therefore clarity in the vital far righthand box in the graphic which contains the vital references to the chapters/ sections concerned. Also insert reference to new footnote at end of bolded title of x axis "Global Mean Temperature relative to 1980-1999 (oC)". Text in the footnote is the existing last sentence of the explication, so reads; "To express temperature changes relative to 1850-1899, add about 0.5 oC" (Pat Finnegan, Grian)	graphic revised to enhance readability and caption amended
SPM-1190	E-SPM-706	A	11				Table SPM-2. You need to add a panel below "health" in this table on "political". Large drought stress in North Africa and central America are almost certain to stimualate migrations to more developed countries. International disaster aid will likely increase due to these pressures. There may be other chapters you can include. (Tom Crowley, Duke University)	rejected; insufficient quantitative information in underlying reports
SPM-1191	E-SPM-707	A	11				Table SPM-2. This table should be made larger. However, it seems overly complicated for SPM and one could question its necessity since the text highlights the important points and refers to the underlying section of SYR where it also appears. (Sharon Smith, Geological Survey of Canada)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG

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								SPMs. Caption extended.
SPM-1192	E-SPM-708	A	11				Table SPM-2. The rationale for adding 0.5 degrees C is unclear. Can an additional sentence be added to clarify matters? (Robert Jefferies, University of Toronto)	Caption amended
SPM-1193	E-SPM-709	A	11				Table SPM-2. It is not clear what the entries on the right side of the table represent. It is assumed that this is the source of the information but the caption does not indicate this. This section of the table could be removed since the table is found in the full SYR and all references can be given there (since readers are referred to the appropriate section, further details can be obtained there). (Sharon Smith, Geological Survey of Canada)	accepted
SPM-1194	E-SPM-710	A	11				Table SPM-2. It is difficult to see how 'increased coral bleaching' 'most coral bleached' and 'widespread coral mortality' can be argued for on the basis of a global mean annual temperature change because bleaching incidence is related to thresholds to bleaching and the 'distance' in local temperature terms of corals in any one location from that of the regional threshold to bleaching. In some locations these statements may well be true but it is difficult to see how one can make a blanket statement of this kind as there is no blanket response of corals around the world to temperature rise. There will even be locations on the margins of the reef seas where increased temperature will be beneficial to corals. This argument is quite apart from the additional arguments about coral adaptation to increased temperatures. (Thomas Spencer, University of Cambridge)	supporting information found in WGII chapter 4; wording follows approved WGII SPM wording
SPM-1195	E-SPM-711	A	11				Table SPM-2. I found this Table very informative but hard to follow. It came much clearer when used in Topic 3. (Alvaro Osornio Vargas, Universidad Nacional Autónoma de México)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1196	E-SPM-712	A	11				Table SPM-2. In the section on Food at the lower right hand end, presumably the comment should be 'Cereal productivity to decrease on mid- to high latitude regions'. Otherwise it is confusing given the comment above it for low latitudes. (George Walker, Aon Re Asia Pacific)	Rejected – does not necessarily apply to all mid- to high latitude regions
SPM-1197	E-SPM-713	A	11				Table SPM-2. This table appears to incorporate an element of time which was removed from WG2 SPM. Although the temperature changes may occur over the period given it is not clear whether the projected impacts would occur over a similar time scale or they represent an equilibrium condition (Sharon Smith, Geological Survey of Canada)	Table revised, no longer shows warming during the 21 st century
SPM-1198	E-SPM-714	A	11				Table SPM-2, upper part: There are six bars at the very top, unlabelled. There are only four labels in the box below them. It would help to label the six SRES marker scenarios, or at least	Table (now called Figure) has been revised to show warming

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							those not labelled in the box below. Lower part: are the reference to WGII chapters? if not within the SYR, they should be identified as such, or adjusted (Harald Winkler, Energy Research Centre, University of Cape Town)	ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1199	E-SPM-715	A	11				Table SPM-2, top section: Use same colors as Fig. SPM-5 for different scenario lines. (Alan Robock, Rutgers University)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1200	E-SPM-716	A	11				Table SPM-2, first (blue) box referring to water: ...exposed to increased water stress (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	accepted
SPM-1201	E-SPM-717	A	11				Table SPM-2 Is it possible to better explain, in the figure caption, the meaning of the numbers that are on the right-end side of the figure. (Yves Michaud, Geological Survey of Canada)	Caption amended
SPM-1202	E-SPM-718	A	11				Table SPM-2 contains a very important statement that should also be in the text: "Adaptation to climate change is not included in these estimations." (Elizabeth L Malone, Pacific Northwest National Laboratory)	accepted, is now in text
SPM-1203	E-SPM-719	A	11				Table SPM-2 : the meaning of numbers in the right hand side part of the table should be better explicited (Nicole Lenotre, BRGM)	caption amended
SPM-1204	E-SPM-720	A	11				Table SPM 2: suggest labelling the solid lines at the top with the appropriate SRES scenario identifying letter/number combinations for ease of reference. On this iteration of the table and throughout. (Steve Sawyer, Global Wind Energy Council)	accepted in revised table
SPM-1205	E-SPM-721	A	11				Table 2 and text on p. 12 between lines 17-27 make an important point about the continued warming even in the case of unchanged GHG concentrations. However, they do not bring up the CO2 emission reduction rate that would be required to achieve unchanged GHG concentrations. Adding this reference both to the figure and the text would translate the argument to practical implications. (Jouni Paavola, University of Leeds)	not possible to include this information here; constant concentration experiment deleted
SPM-1206	E-SPM-722	A	11				Suggest using the same colour as in Figure SPM.5 of WG I also for the "constant year 2000 concentrations" line, i.e. ~orange. Revise line 14 accordingly. (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	transient warming lines deleted
SPM-1207	E-SPM-723	A	11				Quality of Table SPM-2 is bad. What is the list of symbols to the right? There is a different list of scenarios for the lower and upper part of the table. Is it possible to make these consistent? (Michel Rixen, NATO Undersea Research Center)	Table (now called Figure) has been revised to show warming ranges consistent with approved

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								material from all three WG SPMs. Caption extended.
SPM-1208	E-SPM-724	A	11				Please consider extending the time extent of the top part of the table back to 1990, to match the time extent of the lower part of the table. (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Time frame removed from revised table
SPM-1209	E-SPM-725	A	11				On water availability: Increasing Water availability in moist tropics. This is not necessarily true in some tropical countries (See lines 37 to 41 in page 7 and lines 30 to 33 in page 8 of Intro 3 and lines 39 to 40 in page 12 of SPM). (Lourdes Tibig, Philippine Atmospheric, Geophysical and Astronomical Services Administration)	rejected – this is why it refers specifically to moist tropics, not all tropical countries
SPM-1210	E-SPM-726	A	11				It would help the reader if the SRES bars at the top of SPM-2 were labelled. The labels on the temperature axis should go out to 6 degrees C. (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	accepted
SPM-1211	E-SPM-727	A	11				Is this a figure or a table ? Like Fig SPM-2, it seems inappropriately complicated. There are so many words, the message might just as well be put across with some well-chosen text. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1212	E-SPM-728	A	11				I have reviewed Table SPM-2 several times and can find no definition of the information in the right hand box, should be provided. (Robert Molinari, University of Miami)	caption amended
SPM-1213	E-SPM-729	A	11				I consider it as very important, since quite informative, to keep the GMT trajectories on the top of the figure. (Andreas Fischlin, Integrative Biology - Systems Ecology)	time transient trajectories removed since not all SRES scenarios are available; replaced with complete set of SRES warming by end of 21 st century
SPM-1214	E-SPM-730	A	11				(Table SPM-2) Why is it a purple line in this figure and orange line in Fig SPM-5? (Janice Lough, Australian Institute of Marine Science)	lines removed
SPM-1215	G-SPM-419	A	11				The important issue of timing is not accounted for in Table SPM-2. It is unlikely that 2°C warming by 2100 would lead to the same impacts as 2°C warming by 2050, especially for those systems and sectors where non-climate factors such as management, technology, and adaptation can play a role in determining the extent of impacts. (Government of United States)	transient warming removed
SPM-1216	G-SPM-420	A	11				The caption correctly states that the quantitative ranges for water scarcity and flooding issues are due to ranges in underlying socio-economic assumptions embedded in SRES.	this is not correct, see underling chapters of WGII report – some

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							An additional useful caveat is that most impacts listed in this table are not directly associated with the underlying socio-economic assumptions embedded within SRES, but are usually only associated with the temperature outputs from SRES + climate models. (Government of United States)	take socio-economic projections into account
SPM-1217	G-SPM-421	A	11				Table SPM2: The reference table on the right side of the Table is effective therefore we suggest to keep it as is. One additional suggestion we would like to make is that currently, which Working Group the data comes from is slightly unclear. Thus, we would like to see the following added: i.e."Reference: WG2". (Government of Japan)	Accepted
SPM-1218	G-SPM-422	A	11				Table SPM-2: The bars at the top of the Table need a legend to identify the relevant SRES scenarios. The authors should consider if we can state that the B1 warming range is similar to that for stabilising CO2 concentrations at 550 ppm. (Government of Australia)	Accepted; stabilisation scenarios are dealt with in topic 5
SPM-1219	G-SPM-423	A	11				Table SPM-2: Please include curve for A1FI results WITHIN the diagram, analogue to the other SRES-curves, because it is highly policy relevant with respect to recent global emission trends. (Government of Germany)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1220	G-SPM-424	A	11				Table SPM-2: Please include curve for A1FI results WITHIN the diagram, analogue to the other SRES-curves, because it is highly policy relevant with respect to recent global emission trends. (Government of Germany)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1221	G-SPM-425	A	11				Table SPM-2: important Table, but it would be much more useful if the following information was included: in upper part: include all SRES scenarios, not only B1, A1B, A2. Include mitigation scenarios, including temperature ranges for equilibrium temperature. Include information on impacts even if they are not expected before 2100 (such as triggering of Greenland ice sheet melting, risk of disintegration of West-Antarctic Ice Sheet), if this impact is triggered by global warming of certain scale. In particular, add more rows including key vulnerabilities and risks of triggering abrupt non-linear changes, such as ice sheet melting/disintegration and impact on sea-level rise also beyond 2100. Otherwise this table gives the wrong impression and does not give the full picture in terms of risks linked to global warming at different levels, and in terms of which risks can be avoided by certain lower levels of temperature. If this information is not included, there is a gap between this section and the important summary of topic 5 following later (page 16 onwards). IN general, information in Table SPM-2 should not be limited to high-confidence-statements, as this can be misleading for policymakers and contradicts the	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended. Table entries follow those approved in the WGII SPM

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							approach described later in the summary of topic 5 (decision making involves an iterative risk management process. Information on impacts with large or large-scale or irreversible damages are relevant even if it is only given with medium or even low confidence. (Government of Germany)	
SPM-1222	G-SPM-426	A	11				Table SPM-2: Ecosystem: What does the black line at the left of "Up to 30% of species at increasing risk of extinction" mean? Please add an explanation of the meaning of the black line in a footnote, or delete the line if it is an error. (Government of Japan)	graphic design follows approved design of WGII SPM; indicates beginning of relevant impacts
SPM-1223	G-SPM-427	A	11				Table SPM-2. The solid bars and dotted lines and arrows need to be checked. What is the solid line before the text " Up to 30 % of species...." suppose to link between? Shouldn't the lower line on food have an arrow? (Government of Norway)	graphic design follows approved design of WGII SPM; indicates beginning of relevant impacts
SPM-1224	G-SPM-428	A	11				Table SPM-2. The intervals on top of the figure should be explained in the figure. (Government of Norway)	caption amended
SPM-1225	G-SPM-429	A	11				Table SPM-2. The fonts used in the table are very small, the figure/table should be made larger to increase font size and hence make it possible to use this figure in powerpoint presentations etc in the future. Legend and table could be separated on two pages if needed. (Government of Norway)	graphic representation improved
SPM-1226	G-SPM-430	A	11				Table SPM-2. See comment above for Figure SPM-5 on the artificial fluctuations of the global temperature projections. Furthermore, can the important conclusions on the Greenland ice sheet be included? [TSU note: See Comment G-SPM-384-A] (Government of European Community)	transient warming graphs removed; Greenland discussed in other parts of SPM
SPM-1227	G-SPM-431	A	11				Table SPM-2. Regarding the use of colours: In the upper part of the table red and green should not be used together, as these colours are impossible to separate for colour-blind people. (Government of Norway)	colouring revised
SPM-1228	G-SPM-432	A	11				Table SPM-2. Regarding the bars on the top related to the six SRES marker scenarios: even though being used and explained earlier in the SPM, the grey bars should either be removed or explained (next to the bars). The figure should be self-explaining, and at present the grey bars are only confusing. (Government of Norway)	caption amended and table revised
SPM-1229	G-SPM-433	A	11				Table SPM-2. In the row starting with "FOOD" middle column the expression "Cereal productivity to decrease in some regions" seems to be less logic or unclear. We suggest	rejected – does not apply to all mid to high latitude regions;

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							the following wording: "Cereal productivity to decrease in some regions in mid- to high latitudes" (Government of Norway)	using approved WGII SPM wording
SPM-1230	G-SPM-434	A	11				Table SPM-2. Consider to interchange the horizontal and vertical axis since temperature normally is presented on the y-axis in other figures (e.g. SPM-5 and SPM-8) and it will be more similar to a "thermometer". This will make it easier for the reader. We propose to rename the table to a figure since it looks more like a figure than a table. (Government of Norway)	table revised; transient warming graphs removed
SPM-1231	G-SPM-435	A	11				Table SPM2, Upper part of the table: 0-5 needs to be labeled for temperature. (Government of Japan)	accepted
SPM-1232	G-SPM-436	A	11				Table SPM2, Upper part of the table: The bars at the top of the table are initially confusing but the description is effective. However, there is still concern about the amount of detail required to introduce the visual representation of this data. Additionally, all of the 6 SRES scenarios should be presented in this graph. (Government of Japan)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1233	G-SPM-437	A	11				Table SPM-2 is way too complex to be understood by the average policymaker. Add column title "references" at the top of the rightmost cell. (Government of United States)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended.
SPM-1234	G-SPM-438	A	11				Table SPM-2 is problematic; even so, the inclusion of WG1 Figure SPM-5 on top is a good attempt at synthesis. The SPM-5 temperature change patterns need further discussion in the SPM to justify inclusion. If the augmented Table SPM-2 is kept as is, then (i) drop the purple line (fixed abundances) since it is not a realistic scenario and does not contribute anything here; (ii) drop the envelopes about the A2, A1B, B1 lines since these are ± 1 sigma (a totally new notation, representing 68% confidence interval) and the bars at the top are all that is needed (likely = 66%). There is a problem with this figure as used in the WG1 SPM since both envelopes and bars are "likely" (66%) but based on different range of models (without this being made clear to the reader). Showing two different confidence ranges for the same result is a bad choice in the Synthesis Report. (Government of United States)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG SPMs. Caption extended. Transient warming graphs removed, which solves most of the problems pointed out in this comment.
SPM-1235	G-SPM-439	A	11				table SPM-2 is hard to read and interpret – consider making it more readable or the alternative of replacing its contents by bullets of text. (Government of Kingdom of Saudi Arabia)	Table (now called Figure) has been revised to show warming ranges consistent with approved material from all three WG

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								SPMs. Caption extended.
SPM-1236	G-SPM-440	A	11				Table SPM-2 comment: This table has confused a number of readers, who have not read the caption fully, because it is not clear that the level of warming associated with the onset of a given impact is to be read from the left-hand side of the text. We suggest that in ALL cases, the start of the black lines forming the arrow shafts is used to indicate the onset of impacts and the text is inserted along the line, as for the first impact, extinctions, in the 'ecosystems' row. A small vertical bar, to form a 'T' at the left to indicate the onset would be still clearer, although we appreciate the onsets are generally approximate. (Government of New Zealand)	Rejected – graphic design follows approved WGII SPM table
SPM-1237	G-SPM-441	A	11				Table SPM-2 comment: This is a very useful table, with the lower part in particular providing a strong visual image that captures the attention of lay readers. (Government of New Zealand)	Noted and taken into account in revisions
SPM-1238	G-SPM-442	A	11				Table SPM-2 comment: The caption for this table is rather complex, and consideration should be given to how it can be simplified. (Government of New Zealand)	caption amended
SPM-1239	G-SPM-443	A	11				Table SPM-2 comment: It is vital that the reader is aware that the table lists only those impacts for which the confidence level is 'high'. In the caption referring to the lower part of the table, the statement referring to this should be moved from the end of that part of the caption, to the beginning (or immediately after the first sentence), and re-worded thus: "The table lists only those impacts for which the confidence level is high." (Government of New Zealand)	Rejected; proposed wording would suggest that all impacts that have high confidence are listed, but they represent only a sample.
SPM-1240	G-SPM-444	A	11				Table SPM-2 comment: In the lower part of the table, the distinction between dotted and solid black lines is not needed. (Government of New Zealand)	Rejected – graphic design follows approved WGII SPM Figure
SPM-1241	G-SPM-445	A	11				Table SPM-2 comment: Ecosystems row - top line: It is not clear why one text entry reads "Up to 30% of species at increasing risk of extinction", while the other reads "Significant extinctions around the globe" and has a footnote "Significant is defined here as more than 40%". Why not replace 'significant' with 'more than 40%' ? That then avoids the question of why 40% is defined as significant and not 30% or 50%. We note the Glossary for the SYR does not give a definition of 'significant'. (Government of New Zealand)	Rejected – wording follows approved WGII SPM Figure
SPM-1242	G-SPM-446	A	11				Table SPM-2 . This table is too busy, but the following suggestions should improve the readability. 1) Label the scenarios at the top as is done in Figure SPM-5. 2) Keep the colours the same as in Figure SPM-5 and as is used in the WGI original figure for ease of	Taken into account in revisions of the table

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							comparison. 3) Delete references in right hand column in the SPM version while adding a short sentence to the caption explaining that references can be found in the underlying report. 4) Move the last sentence from the caption, "Add about 0.5°C to express the temperature change relative to pre-industrial" to the end of the current x-axis label. This would make the conversion much easier and allow readers to directly make the association to pre-industrial. (Government of Canada)	
SPM-1243	G-SPM-447	A	11				Table SPM 2: It seems unlikely that the "percentage of species that are at increasing risk of extinction" is a robust quantity. The statement sounds alarming, but is it? Is the risk of extinction known? And its increase? Also in comparison with risks due to natural variations? We suggest to rephrase "Up to 30% of species at increasing risk of of extinction " by : "Increasing risk of extinctions". (Government of Netherlands)	Rejected – wording follows approved WGII SPM Figure
SPM-1244	G-SPM-448	A	11				Table 2. Under water: Hundreds of millions of people exposed to increased water stress (Government of Sweden)	correction accepted
SPM-1245	G-SPM-449	A	11				In Table SPM-2, the 'constant year 2000 concentration' scenario adds little value given the impossibility of its occurrence. Also, it could be confused by policymakers who view it as potential future scenario that can avoid significant impacts. The bars on top represent all six emissions scenarios, while the concentration plot only includes three. On balance, the figure underestimates impacts by excluding the A1F1 scenario and including the constant concentration scenario. The graphic could be changed along the lines of the figure shown in an attachment to be sent under separate cover to the SYR Secretariat (entitled <USG-supplement.doc>). [TSU note: See Appendix for this figure]. (Government of United States)	constant concentration deleted and table revised; suggestions taken into account in revisions
SPM-1246	G-SPM-450	A	11				In Table SPM-2 it is not clear the usefulness of including on top of the Table SPM-2 a figure with temperature predictions for the current century according to different scenarios, since very similar information is presented in the same document a few pages before (Figure SPM-5, page 9). If still it is considered appropriate to include such a figure on top of Table SPM-2, a label on the y-axis should be included, stating which is the variable plotted on the graph. (Government of Chile)	Taken into account in revision of table
SPM-1247	G-SPM-451	A	11				the upper panel: there are 4 curves (with confidence shadings), but 6 horizontal bars. This should be unified in some way. Alternatively the bars could be eliminated (some of them were produced with assumptions about carbon-temperature feedback that is not widely accepted by experts, as said above – page 8, lines 14-15). (Government of Russian Federation)	Revised table shows full set of warming ranges for SRES scenarios

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SPM-1248	G-SPM-452	A	11				Table SPM-2: It is suggested to add a similar Table on regional impacts, as apart from this globally aggregated information regionally differentiated information is very important for policymakers. (Government of Germany)	Rejected due to space limitations in longer report
SPM-1249	G-SPM-31	C	11				Table SPM-2: In the draft version of this table prepared for WG2 SPM there was also a box (row) for "singular events", such as impacts due to a change in the thermohaline circulation or a partial collapse of polar ice sheets. This box was excluded on the basis that such information should not be created by WG2 alone without consulting WG1, however delegates remarked that it could be possible to bring back such a box in the synthesis report. Another issue was that such events may occur after prolonged exposure to the indicated temperatures, rather than within the same timescales as the SRES scenarios. This long-timescale issue could be resolved by putting back the stabilisation scenario bars which were also associated with the draft of this plot for WG2 SPM, and remain in WG2 TS. (Government of Belgium)	Revised table shows stabilisation warming ranges; singular events not included because this would risk confusing long-term impacts with those expected to occur during 21 st century under SRES scenarios
SPM-1250	G-SPM-32	C	11				Table SPM-2: For the draft of WG2 SPM the authors also prepared a table like SPM2 by region rather than by sector. At the insistence of some governments the numbers had to be adjusted to be consistent with a high confidence level, a complex process which could not be completed to everybody's satisfaction during the short time available at WG2 plenary. Now that we have more time, it would be good to bring back some of this regional information in the SYR. Recalling that it was particularly difficult to find appropriate words to express the uncertainty ranges concisely but accurately, instead it is suggested to show this graphically. Small plots could be created with different-coloured lines for each region, showing how many millions of people in each region are at risk of water stress, food shortages, increased disease, coastal flooding, etc. all as a function of temperature, using shading (transparency) to indicate the uncertainty ranges. One challenge to consider is that for most items uncertainty applies to both the impacts (y) and the temperature (x) due to extrapolation from the original scenarios studied. Such a graphic should also be included in SYR topic-3. (Government of Belgium)	Rejected due to space limitations in the longer report; graphical suggestions are unlikely to find consensus and be sufficiently robust
SPM-1251	E-SPM-731	A	12	1	12	1	You discuss climate and its "effects" and also "impacts" What is the difference between the two? (Peter Berry, Health Canada)	Not a strict difference; impacts tends to be by definition negative, effects more neutral
SPM-1252	E-SPM-732	A	12	1	12	2	Too loose of a statement. It needs to be more precisely stated. (Germán Poveda, Universidad Nacional de Colombia)	taken into account, new wording used
SPM-1253	E-SPM-735	A	12	1	12	2	The word "change" is too vague. I would suggest combining the bold statement and the explanatory statement below to something like "Altered frequencies and intensities of extreme weather, climate and sea-level events are very likely to adversely effect agriculture, forestry, water resources, human health, industry and settlements." (Katherine Casey Delhotal, RTI International)	taken into account, new wording used

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SPM-1254	E-SPM-737	A	12	1	12	2	Suggest that the headline message on extremes is somewhat wanting - impacts due to altered extremes are very likely to change. (Roger Street, UKCIP-OUCE)	taken into account, new wording used
SPM-1255	E-SPM-738	A	12	1	12	2	On line 2, use of "change" hides our knowledge of the direction of the change--change "change" to something like "increase" or "intensify"--and try to generally in the text indicate the direction of the change and not use the word "change" as much. (Michael MacCracken, Climate Institute)	taken into account, new wording used
SPM-1256	E-SPM-739	A	12	1	12	2	Impacts are very likely to change -- what does this mean? That there are impacts now and they are likely to be different later? That phrase is extremely vague and much less informative than the sentence which follows; it refers to 'adverse effects' which has a clear meaning. (Noel Gurwick, Carnegie Institution)	taken into account, new wording used
SPM-1257	G-SPM-454	A	12	1	12	2	This statement is vague and unclear. (Government of European Community)	taken into account, new wording used
SPM-1258	G-SPM-455	A	12	1	12	2	This sentence is so obvious that it does not carry any information at all and as it stands, could be qualified as absolutely certain. At least, replace the last word "change" by "increase in most places" (Government of France)	taken into account, new wording used
SPM-1259	G-SPM-457	A	12	1	12	2	The sentence seems to have little meaning and not to be consistent with the text underneath, line 4-6. It could eventually be replaced with line 4-6. (Government of Norway)	taken into account, new wording used
SPM-1260	G-SPM-459	A	12	1	12	2	Could the expression "sea-level events" be explained? (Government of Norway)	taken into account, new wording used
SPM-1261	E-SPM-734	A	12	1	12	6	This is not credible. At the system level the Earth will be a more hospitable place, with problems of a more local nature. When the extreme impacts of extreme model runs of all scenarios are mixed together as has been done in some of the underlying chapters, the result is a an unlikely set of impacts that have displaced all the likely benefits, leading to poor advice to the decision-makers who are looking for guidance from IPCC. (John Everett, Ocean Associates, Inc.)	Rejected; projected changes in extremes have predominantly negative effects; this is the focus of this section
SPM-1262	E-SPM-736	A	12	1	12	6	The statement in normal type is much more meaningful than the statement in boldface, which should be deleted as too general and obvious. (Elizabeth L Malone, Pacific Northwest National Laboratory)	taken into account, new wording used
SPM-1263	G-SPM-458	A	12	1	12	6	Deleting this heading (lines 1-2) and replacing the heading with lines 4-6 is suggested. (Government of Japan)	taken into account, new wording used

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SPM-1264	G-SPM-456	A	12	1	12	15	The style of 'chapeau text followed by explanatory paragraph' leads in general, and particularly in these two cases, to unfortunate and unnecessary repetition. Some way to reduce repetition should be sought. (Government of New Zealand)	taken into account in first instance; second instance deleted
SPM-1265	G-SPM-33	B	12	1	12	44	The aggregate costs of climate change should be mentioned in this section. Including that estimates for aggregate global damage costs are negative, with some quantification - whether in terms of a range of annual GDP loss (1-5% was in WG2), or in terms of a range of social cost of carbon estimates. It would be important to caveat these quantifications, noting why they vary, that they increase over time, as well as the high likelihood that they are underestimated because it is difficult to quantify non-market impacts. Aggregation also hides the fact that costs are likely to be higher in some developing countries/regions. (Government of United Kingdom)	Aggregate costs now mentioned later in SPM
SPM-1266	E-SPM-740	A	12	1	13	30	I suggest another succession of the paragraphs: 12:17-27, 12:8-15, 12:1-6, 12:20-13:7, 13:25-30 and 13:9-23. (Annick Douguédroit, Université de Provence)	Rejected ; we believe the current order (with some deletions) is appropriate
SPM-1267	E-SPM-733	A	12	1			This sentence seems almost empty of meaning and I cant understand what it refers to - will impacts change by adaptation? Or because the extremes change (Gabriele Hegerl, Duke University)	taken into account, new wording used
SPM-1268	G-SPM-453	A	12	1			We think that most readers will not be able to distinguish between "weather" and "climate" events - could one of these words be omitted from the statement? (Government of Norway)	taken into account, new wording used
SPM-1269	G-SPM-34	B	12	1			Please make it clear that the impacts of climate change will become more severe and widespread as temperatures rise (Government of United Kingdom)	taken into account, new wording used
SPM-1270	E-SPM-741	A	12	2			Replace "change" with "be substantial". (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	taken into account, new wording used
SPM-1271	E-SPM-742	A	12	4	12	4	Replace 'to have mostly' with 'to have some positive but mostly'. (John R. Porter, University of Copenhagen)	Rejected - This seems to be implied by saying "mostly"?
SPM-1272	G-SPM-461	A	12	4	12	4	Replace "extremes" by "extreme events". (Government of Republic of Benin)	rejected – extremes is commonly used term
SPM-1273	E-SPM-743	A	12	4	12	6	Re: human health sector - Is this with or without adaptation? (Peter Berry, Health Canada)	specific reference to health has been deleted
SPM-1274	E-SPM-744	A	12	4	12	6	Include reference to biodiversity and marine and coastal ecosystems. (Magdalena Muir, Environmental and Legal Services Ltd.)	specific reference to impacted systems has been deleted

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SPM-1275	G-SPM-460	A	12	4	12	6	The sentence beginning on line 4 appears to be drawn from Topic 3, lines 4-26 (p. 12). In an attempt to summarize those lines, it states that “increases in many extremes over the 21st century are expected to have mostly adverse effects.” However, Topic 3 indicates that not all effects would be “adverse.” The sentence needs to be revised. (Government of United States)	Rejected - “mostly” implies that not all effects are adverse, otherwise one would use “all” or not use any qualifier at all
SPM-1276	G-SPM-462	A	12	4	12	6	For clarity, change "extremes" to "climate extremes". (Government of European Community)	rejected – extremes is a commonly used term
SPM-1277	G-SPM-35	B	12	4	12	6	Biodiversity should be added to this list of sectors that will be impacted the most; given table SPM-2 there's some serious impacts at medium temperature increases e.g. 30% of species at risk of extinction. Suggest add biodiversity or clarify why it is not in this list. (Government of United Kingdom)	specific reference to impacted systems has been deleted
SPM-1278	G-SPM-463	A	12	4			“natural systems” is missing from the enumeration (Government of Hungary)	specific reference to impacted systems has been deleted
SPM-1279	E-SPM-745	A	12	5	12	5	natural ecosystems and infrastructure (roads, bridges, urban settlements, etc.) (Germán Poveda, Universidad Nacional de Colombia)	specific reference to impacted systems has been deleted
SPM-1280	G-SPM-33	C	12	5	12	5	does ‘industry’ include e.g., transport, tourism ?? probably not, so maybe explain (Government of Belgium)	specific reference to impacted systems has been deleted
SPM-1281	G-SPM-464	A	12	5	12	6	To be consistent with WG2-SPM, add: forestry, "ecosystems"... industry, settlements "and society". (Government of Canada)	specific reference to impacted systems has been deleted
SPM-1282	E-SPM-746	A	12	7			Would mention the vulnerability of the energy sector; heatwaves and grid failures; storms and damage to oilrigs, pipelines and refineries and the grid; melting tundra and pipelines; heat waves, water warming and nuclear plant shutdowns. (Paul Epstein, Harvard Medical School)	specific reference to impacted systems has been deleted
SPM-1283	E-SPM-748	A	12	8	12	9	But do any development pathways hold more good news than bad news? If not, say that. (Noel Gurwick, Carnegie Institution)	Section deleted for space reasons
SPM-1284	G-SPM-465	A	12	8	12	11	This bolded language is not an accurate reflection of the language it references in the WG2 SPM. Replace “Magnitudes and timing of projected impacts” with “Future vulnerability”. Change “Impacts of” in line 11 to “Vulnerability to”. Make the same changes in bolded language in Topic 3, page 12, lines 28-29. (Government of United States)	Section deleted for space reasons
SPM-1285	G-SPM-467	A	12	8	12	13	Delete lines 8-9 and replace heading with lines 11-13. (Government of Japan)	Section deleted for space reasons

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SPM-1286	E-SPM-747	A	12	8	12	15	It is not clear how these statements fit with the table SPM-2. Were development pathways considered in developing Table SPM-2. Reference to the table could indicate to readers that development pathways have been incorporated. How is timing of impact influenced by development pathway? It is suggested that reference to the table be removed and the text simply indicate that the link between the impact and development pathways. (Sharon Smith, Geological Survey of Canada)	Section deleted for space reasons
SPM-1287	G-SPM-466	A	12	8	12	15	It is not clear how these statements are supported by Table SPM-2. Suggest deleting reference to this table and instead of existing sentence 2, use the phrasing of lines 37-40 of Topic 3 page 12: "To illustrate, the projected number of people affected by climate change in terms of food supply, risk of coastal flooding and water scarcity, is significantly greater under the SRES-A2 type scenario of development than under other SRES futures." (Government of Canada)	Section deleted for space reasons
SPM-1288	E-SPM-749	A	12	10			very unlikely abrupt changes in ice sheets - what is this based on? I cant recall this from WGI but I may have missed it. If not, what would this be based on? I thought projecting ice sheet melting is difficult at present, see caveats in sea level statement WGI? Overall, I think the sea level and ice sheet statement line 20-23 covers ice sheets well, and I would definitely avoid a new assessment of this difficult topic. (Gabriele Hegerl, Duke University)	Refers to page 13; wording revised
SPM-1289	E-SPM-752	A	12	11	12	12	First of all congratulations to the authors and thank you for the opportunity to comment.WG II chapter 20 also identifies "adaptative capacity" as a factor of vulnerability; we suggest adding it next to "development pathway". (Silvia Llosa, International Strategy for Disaster Reduction)	Section deleted for space reasons
SPM-1290	E-SPM-750	A	12	11	12	15	requires elaboration (Peter Haas, University of Massachusetts)	Section deleted for space reasons
SPM-1291	E-SPM-751	A	12	11	12	15	It seems that some impacts will be high irrespective of population, income and level of technological development. For example, oceans acidification and impacts on biodiversity and coastal ecosystems will be difficult to mitigate. Increased temperatures and declining precipitation in the Mediterranean region will continue to cause ecosystem, social and culture impacts, irrespective of adaptation measures. (Magdalena Muir, Environmental and Legal Services Ltd.)	Section deleted for space reasons
SPM-1292	E-SPM-753	A	12	11	12	15	Avoid "determinants" here; "associations" may work, but the whole statement should be recast. Confused uses of "impacts" and "vulnerable" further muddle the meaning. Defining a population as "vulnerable" of course means they will be very affected by climate change. Populations and their locations, infrastructure, and resource management technologies do not necessarily affect the impacts but certainly affect how vulnerable or resilient societies are to the impacts.	Section deleted for space reasons

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							(Elizabeth L Malone, Pacific Northwest National Laboratory)	
SPM-1293	G-SPM-468	A	12	11	12	15	Would benefit from further elaboration. (Government of United States)	Section deleted for space reasons
SPM-1294	E-SPM-754	A	12	13	12	15	This sentence is an oversimplification and does not explain the significance of development pathways clearly. It is obvious that the number of people at risk depends on the assumed size of the vulnerable population, what is missing is that development pathways can be far more important than actual changes in climate. Suggest reverting to language of SR3.3 I. 37-41. Also, drop reference to Table SPM-2 as it is not possible to conclude anything about development pathways from it. (Donald Lemmen, Natural Resources Canada)	Section deleted for space reasons
SPM-1295	G-SPM-469	A	12	13	12	16	The sentence looks rather strange. We suggest the following change "For example, the number of people exposed to reduced food supply, flood risk or water scarcity due to climate change strongly depends on the assumed size of the vulnerable low-income population. Insert here also the following new sentence "In general, elderly people are particularly more vulnerable, so also children and chronically ill persons". It is important to make this point to the decision-makers to take into account when planning adaptation strategies. (Government of Sweden)	Section deleted for space reasons
SPM-1296	E-SPM-755	A	12	15	12	15	Insert "and also on whether adaptation measures are taken, or not." (So reads: "...strongly depends on the assumed size of the vulnerable low-income population and also on whether adaptation measures are taken, or not" (Pat Finnegan, Grian)	Section deleted for space reasons
SPM-1297	E-SPM-756	A	12	16			Would add that a robust, resilient, self healing smart grid with distributed, regional and central power generation are good for coping with climate change (adaptation) and preventing further climate disruption (mitigation). [Note for the authors -- Please note this was the most forward thinking element that emerged at the May 2007 Ann Arbor Conf Coping with Climate Change, organized by Rosina Bierbaum. If you need a reference for this very crucial point, please see: Chart on Page 7 of http://chge.med.harvard.edu/research/ccf/documents/ccf_final_report.pdf (Paul Epstein, Harvard Medical School)	Section deleted for space reasons
SPM-1298	E-SPM-757	A	12	17	12	18	This sentence needs to be modified to indicate that changes are already happening. So, say that "With many types of impacts already evident, future impacts of many types are unavoidable as the global climate continues to adjust to past emissions." (Michael MacCracken, Climate Institute)	Rejected – attribution of observed impacts has not been made for all the projected impacts listed
SPM-1299	E-SPM-759	A	12	17	12	18	It is important to mention that there are also lags between changes in climate and the response of biophysical systems. This is particularly true of cryospheric systems (due to latent heat effects etc.). This also means that changes in biophysical systems may continue long	Space reasons prevent more detailed discussion in SPM

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							after climate has stabilized. This slow or delayed response of biophysical systems should be mentioned as it is quite different than the inertia of the climate system. There seems to be an assumption that climate system is understood to include all natural systems but many readers will likely not make this assumption. (Sharon Smith, Geological Survey of Canada)	
SPM-1300	E-SPM-760	A	12	17	12	18	"appear" should be replaced by "are", in order to guarantee consistency with the text in SPM, Page 12, line 23; Topic 3, Page13, line 4; WGI 10.3, 10.7, SPM; WGII Table SPM-1; WGIII 3.2, 3.3. (Christian Kjaer, European Wind Energy Association (EWEA))	Taken into account in revision of wording for entire paragraph
SPM-1301	G-SPM-470	A	12	17	12	18	This sentence is rather weak. Suggest to reformulate "Further impacts of climate change in the future are unavoidable, ...". (Government of European Community)	Rejected – there are some uncertainties that need to be recognised in the headline
SPM-1302	E-SPM-758	A	12	17	12	27	This section is a model of directness and clarity. (Elizabeth L Malone, Pacific Northwest National Laboratory)	Thank you
SPM-1303	G-SPM-471	A	12	17	12	27	This section must be revisited to address concerns made in the related Topic 3 section. Specifically, the bullets are not connected to committed warming in their original placement in the WG1 and WG2 cited text and should not be attached here. (Government of United States)	Taken into account – reference to adaptation is made in revised text
SPM-1304	G-SPM-36	B	12	17	12	27	This sentence implies a lot of uncertainty as currently phrased, please rephrase to that it is clear that we are more sure that we are committed to future impacts (Government of United Kingdom)	Wording revised, but cannot ignore remaining uncertainties
SPM-1305	G-SPM-472	A	12	17	13	8	This section is very strong and should be maintained in the final draft. (Government of Japan)	thank you; retained
SPM-1306	G-SPM-474	A	12	20	12	20	Insert "Models suggest that" before "Even if" and strike the phrase "had been" and replace it with "were". (Government of United States)	Specific statement deleted
SPM-1307	E-SPM-761	A	12	20	12	21	This is a nonsensical hypothesis--given the short lifetimes of aerosols there is no feasible way, other than some grand geoengineering scheme, to keep the concentrations of both greenhouse gases and aerosols constant. To suggest that the future warming if we halted emissions, which is what really needs to be the hypothesized case, would lead to a warming of order 1 C, not 0.6 C, as a result of adjusting to both the inertia of the system and the loss of the cooling influence of sulfate aerosols. (Michael MacCracken, Climate Institute)	Specific statement deleted
SPM-1308	G-SPM-475	A	12	20	12	22	Delete first sentence. The constant concentration scenario is academically interesting but totally unrealistic. Replace with "The most optimistic SRES scenario gives a global	Specific statement deleted

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							warming of 1.1-2.9 C by 2090-2099 relative to 1980-1999. Consequently, replace the 2nd sentence with "Even the scenario that stabilises the CO ₂ -e concentration at 445-490 ppm (see Topic 5) leads to a global warming of 2.0-2.4 C at equilibrium" (Government of Australia)	
SPM-1309	E-SPM-762	A	12	20	12	27	The concept of vulnerability implies that you only see negative impacts if you are not able (don't have the capacity) to adapt effectively. To state that "some future impacts are already unavoidable" suggests that adaptive actions either will not take place or will fail or that there are currently limits to adaptation that exist or there is widespread vulnerability (I am assuming you are referring in the paragraph to both developed and developing countries) due to significant lack of adaptive capacity. Do we know these things to be true? If so, this should be made explicit, especially any information available on the limits to adaptation. (Peter Berry, Health Canada)	Specific impacts listed cannot be avoided entirely even with adaptation; wording amended to make this explicit
SPM-1310	E-SPM-763	A	12	20	12	27	Support this summary with limited additions. Agree that decreased water availability and increased drought risk in the tropics and subtropics, including the Mediterranean Sea, coast and region. There is also "increased coastal damage from floods and extreme storm events, combined with sea level rise." (Magdalena Muir, Environmental and Legal Services Ltd.)	this is covered in last bullet point
SPM-1311	G-SPM-473	A	12	20			We think that some non-experts might, incorrectly, think that stabilisation of emissions implies stabilisation of concentrations. To underline that stabilisation of concentrations is a very demanding task, we propose that reference is made to the emission reductions needed to attain stabilisation of concentrations. (Government of Norway)	Wording simplified to prevent this misconception
SPM-1312	G-SPM-476	A	12	22	12	22	After 'the 21st century' add the following phrase: "largely in response to past emissions". This is an important part of the message about the delay in the climate system response - that the committed warming is because of past emissions, and not so much a result of what stabilization level was imposed in 2000. In fact, an alternative would be to use the phrasing from the WGII SPM Section D (page 18): Past emissions are estimated to involve some unavoidable warming (about a further 0.6°C by the end of the century) even if atmospheric concentrations remained at 2000 levels." (Government of Canada)	Wording simplified
SPM-1313	G-SPM-477	A	12	23	12	23	Simplify the sentence and make the point that some impacts already occur. Suggest deleting the word 'future' here because some of these unavoidable impacts have already begun. Also, add the phrase "and may already have begun" after the word 'unavoidable'. (Government of Canada)	Wording simplified; "may have already begun" is rejected because it implies attribution of observed effects, which is not supported for all effects listed
SPM-1314	E-SPM-764	A	12	24	12	24	increased coral bleaching 'in some localities'	Rejected, consistent with wording in WGII SPM; shorter version

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							(Thomas Spencer, University of Cambridge)	does not imply in all localities
SPM-1315	E-SPM-765	A	12	24	12	27	edits to provide balance: increased coral bleaching AND RANGE EXPANSION;risk of wildfire IN AREAS PRONE TO DROUGHTS;increased drought risk in the tropics and subtropics AND MORE PRECIPITAION AND LONGER GROWING SEASONS ELSEWHERE. Even in the tropics, there are indications that the models are wrong in that the deserts were wetter during prior warm periods and a recent paper in Nature (last couple weeks) points out that there is a ~6.5% rise in precip per deg C, while the models only use 1-3%, an error of 3X! in results. This explains better the satellite obs (NASA) of a greener, wetter Earth. Links are on my website (http://www.ClimateChangeFacts.info). (John Everett, Ocean Associates, Inc.)	This para focuses on risks from climate change, and is based on impacts highlighted in WGII SPM
SPM-1316	G-SPM-478	A	12	24	12	27	Quantify the magnitude of these impacts, as far as possible : e.g. [3.3] quotes page 7, lines 37-40 that "Changes in precipitation and temperature lead to changes in runoff and water availability which are projected to ...decrease by 10-30% over some dry regions at mid-latitudes and dry tropics".This permits to add "by 10-30%" after "decreased water availability" on line 26. (Government of France)	NO quantification possible since the unavoidable level of warming during the 21 st century is not defined, neither is the potential for adaptation
SPM-1317	E-SPM-766	A	12	25	12	25	Add at end: " and new damages from insects" (Andreas Fischlin, Integrative Biology - Systems Ecology)	rejected – impacts are based on material in Table SPM-2
SPM-1318	G-SPM-479	A	12	25	12	25	Why is “risk of wildfire” in the same bullet as “species range shifts”? It implies that the two are related. Suggest these bullets are deleted; if retained, suggest making “increased risk of wildfire” its own bullet. (Government of United States)	accepted
SPM-1319	G-SPM-480	A	12	25	12	25	It is unclear why species range shifts and risk of wildfire is commingled in the same dot point, suggest these issues are separate and should be individual bullets. (Government of Australia)	accepted
SPM-2135	E-SPM-6	D	12	25	12	25	Add text to the range shifts bullet, "... and consequences for assemblage and ecosystem structure and functioning" (Stephen Hawkins, Marine Biological Association of the UK)	rejected – impacts are based on material in Table SPM-2
SPM-2136	E-SPM-7	D	12	25	12	25	A separate bullet is required for wildfire as it is a separate issue to species range shifts (Stephen Hawkins, Marine Biological Association of the UK)	accepted
SPM-1320	E-SPM-769	A	12	26	12	26	"decreased water availability in ... tropics" is not entirely consistent with Table SPM-2 (Keith Shine, University of Reading)	wording revised; effect is most pronounced in dry tropics and subtropics

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SPM-1321	G-SPM-481	A	12	26	12	26	This bullet is not consistent with Table SPM-2 where decreased water availability is noted for the mid-latitudes and semi-arid low latitudes, rather than the tropics and subtropics. (Government of Canada)	wording revised; effect is most pronounced in dry tropics and subtropics
SPM-1322	G-SPM-482	A	12	26	12	26	Suggest adding: "and the regions supplied by meltwater from mountain glaciers and snow packs". In these regions, more than 1/6 of the world population lives therefore this is an important result. (See Topic 3, page 7, lines 31-35.) (Government of Canada)	rejected – impacts are based on material in Table SPM-2
SPM-1323	G-SPM-483	A	12	26	12	26	add "dry" before "tropics". See also line 39. (Government of Netherlands)	accepted
SPM-1324	E-SPM-767	A	12	26			This statement does not seem to be correct as a generalisation as far as the tropics are concerned and is inconsistent in this respect with Figure 3.2 and 3.3 in Topic 3 which suggest that in general, but with some exceptions low latitudes will be marked by increased rainfall and run-off. (George Walker, Aon Re Asia Pacific)	wording revised; effect is most pronounced in dry tropics and subtropics
SPM-1325	E-SPM-768	A	12	26			confusing with the SMP Table 2 "increased water availability in moist tropics ..." (tropics as generally in the text here) (Tomas Halenka, Charles University, Prague, Faculty of Mathematics and Physics)	wording revised; effect is most pronounced in dry tropics and subtropics
SPM-1326	E-SPM-770	A	12	28	12	28	Table SPM-2 also indicates disease impacts for warming less than 1.0 degC - thus an extra bullet is needed in this list. (John R. Porter, University of Copenhagen)	rejected – this is more amenable to adaptation
SPM-1327	E-SPM-771	A	12	28	12	28	Since the bullets here refer to data presented in (the preceding) Table SPM-2, consistency is vital. Based on Table SPM-2, therefore, as a minimum, in addition to the existing bullets referring to ecosystem impacts under committed forcing, new bullets appear to be required for human impacts. e.g. on: Water: " Hundreds of millions of people exposed to increased water stress" (Note typo in this phrase in the Table, BTW !) and Health: "Increased morbidity and mortality..." etc etc (Pat Finnegan, Grian)	Rejected – the quantification does not necessarily apply to very low levels of warming
SPM-1328	E-SPM-772	A	12	28	12	28	Another item should be listed here: increased rate of melting of glaciers and thawing of permafrost (Andreas Fischlin, Integrative Biology - Systems Ecology)	rejected – impacts are based on material in Table SPM-2
SPM-1329	G-SPM-484	A	12	28	12	28	The health impacts that have already begun and/or are unavoidable are missing from this list of bullets: 1) increased morbidity and mortality from increased heat waves etc., 2) changes in disease vectors. Using the phrase "For example" permits the omission of some key impacts but it will not help get the important messages about key impacts to policymakers. Suggest not using the 'for example' format and instead simply put the colon	rejected – this is more amenable to adaptation

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							after the word 'unavoidable' and then include all the appropriate impacts from Table SPM-2. (Government of Canada)	
SPM-1330	G-SPM-485	A	12	29	12	29	The first part of this sentence seems out of context here. Suggest deleting the phrase "Based on the preceding analysis" and just start the sentence with the phrase 'Some systems....' (Government of Canada)	accepted
SPM-1331	G-SPM-486	A	12	29	12	29	It is not clear which analysis is meant with "Based on the preceding analysis". Remove these words, so the sentence becomes: "Some systems, sectors and regions can ... [etc.]". (Government of Netherlands)	accepted
SPM-1332	G-SPM-487	A	12	29	12	29	Drop "Based on the preceding analysis" as this is inaccurate. The bullets on vulnerability are drawn from various chapters in the WG2 report and not necessarily on the analysis of topics presented in previous sections on page 12. (Government of United States)	Accepted
SPM-1333	E-SPM-775	A	12	29	12	30	From human health perspective it is usually the specific populations within the systems, sectors or regions that are critical for discussions of vulnerability. For example, many Canadian provinces and territories, from an international perspective are considered to have higher adaptive capacity and yet within these reside populations that can be considered highly vulnerable to climate change health risks (e.g., Aboriginal people living off the land, low income/isolated seniors, urban/homeless poor etc). (Peter Berry, Health Canada)	noted – no request for change?
SPM-1334	E-SPM-774	A	12	29	13	2	Here only negative consequences of global warming are listed. While I agree that they will most likely greatly outnumber the positive ones, it is important to be 100% objective and balanced in a scientific report of this kind. Lack of balance will only open this report to criticism by 'climate sceptics'. Therefore I feel that it is a serious omission not to mention that many high-latitude locations, e.g., Iceland, will probably experience a major increase in vegetation in general and woodlands in particular. This may potentially have significant positive consequences for the economy in these regions. (Jon Egill Kristjansson, University of Oslo)	Rejected – this particular section explicitly focuses on the most affected sectors and regions to assist decision-making in minimising damages; it does not aim nor claim to be an impacts assessment
SPM-1335	E-SPM-773	A	12	29	13	7	To show there is no agenda, there needs to be an equivalent section on benefits. These are, in fact, at least as extensive as the negatives and are short changed in the IPCC documents, perhaps because zealots have displaced less impassioned scientists, but there are some benefits that can be brought forward. (John Everett, Ocean Associates, Inc.)	Rejected – this particular section explicitly focuses on the most affected sectors and regions to assist decision-making in minimising damages; it does not aim nor claim to be an impacts assessment

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SPM-2137	G-SPM-5	D	12	29	13	7	On vulnerabilities to climate change it is suggested to mention also the vulnerability of the poor, the children and the elderly. [cf. Topic 3, page 13, lines 37-38] (Government of Argentina)	accepted
SPM-1336	G-SPM-37	B	12	29			The presentation of the regional impacts is very limited and does not convey a sense of urgency. It could be improved significantly by introducing a table of regional impacts for different temperature levels, similar to table SPM-2 for sectors. (Government of United Kingdom)	Rejected due to space limitations; urgency is a value judgement not appropriate for IPCC authors
SPM-1337	G-SPM-488	A	12	32	12	7	This section seems to repeat itself—for example, the Arctic on page 12 (line 36) and page 13 (line 1), low-latitude regions, and so on. Can it be tightened up? (Government of United States)	These are different perspectives; some overlap is unavoidable
SPM-1338	G-SPM-489	A	12	32	12	32	Change the word "are" to "include". The list should not be considered comprehensive. (Government of Canada)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1339	E-SPM-776	A	12	32	12	42	The level of confidence, in relative terms as used throughout the AR4 report may be used for the bulleted points, or relative uncertainty be stated (Richard Anyah, Rutgers University)	Information on calibrated confidence level is not available from underlying report
SPM-1340	E-SPM-778	A	12	32	12	44	For reference to coasts, useful to include references to deltas, estuaries and lagunas, and seagrass meadows, in addition to mangroves and salt marshes. Also useful to refer to saltwater intrusion in low lying aquifers and estuaries. (Magdalena Muir, Environmental and Legal Services Ltd.)	too much detail
SPM-1341	G-SPM-34	C	12	32	13	7	" Could be more obvious to show these impacts on a map" (Government of Belgium)	rejected; it would be difficult and not very instructive to show all systems referred to on a map
SPM-1342	E-SPM-777	A	12	32			I am pleased to see the use of the word "vulnerable" in this section, rather than "affected" as used in the WGII TS. Given this stronger language, I strongly recommend that the word "are" be replaced with "include", so as to not have this listing be considered comprehensive. This is particularly important given the important caveat in SR 3.3 "In all regions, there are certain areas, sectors and communities which are particularly vulnerable". (Donald Lemmen, Natural Resources Canada)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment. Wording has been revised back to WGII TS wording "affected".
SPM-1343	E-SPM-779	A	12	34	12	34	...mountain, grass-land and Mediterranean-type... (Masatoshi Yoshino, Retired)	Rejected; this is intended to be a selection of the most affected

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								regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1344	G-SPM-490	A	12	34	12	34	Write "... forest, mountain and alpine, ..." (Government of Switzerland)	no difference between mountain and alpine? no change
SPM-1345	G-SPM-491	A	12	35	12	36	Consider changing "along coasts" to "coastal" and "in oceans" to "oceanic", for parallelism with "terrestrial". Are authors saying that all coasts are vulnerable? (Government of United States)	wording revised; wording does not say or imply that all coasts are affected
SPM-1346	E-SPM-780	A	12	36	12	36	Coral reefs should be removed. Their range will expand in a warmer ocean and they will not be removed anywhere, based on most of the same species living in the comparatively hot Red Sea. The sea ice biome is a legit impact, but let us not forget that all the existing species were present when there was no ice on the Arctic during the immediately prior interglacial, just 125,000 years ago. (John Everett, Ocean Associates, Inc.)	Rejected; see WGII chapter 4
SPM-1347	G-SPM-492	A	12	36			The term "sea ice biome" will probably not be well understood by many readers. Could "sea ice ecosystems" be used instead? (Government of Norway)	rejected; authors consider the term more appropriate
SPM-1348	G-SPM-493	A	12	36			perhaps, it should be "In oceans: coral reefs and the Arctic sea ice biome", because the authors respond here to recently emerged problems with polar bear. (Government of Russian Federation)	rejected – not only for Arctic sea ice
SPM-1349	E-SPM-781	A	12	37	12	37	Add: " Low-lying coastal regions AND SMALL ISLANDS, due to the threat....." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	small islands are covered under next section
SPM-1350	E-SPM-782	A	12	37	12	38	Add small islands (John Church, CSIRO)	small islands are covered under next section
SPM-1351	G-SPM-494	A	12	37			Add: " Low-lying coastal regions AND SMALL ISLANDS, due to the threat....." (Government of Cuba)	small islands are covered under next section
SPM-1352	G-SPM-497	A	12	39	12	39	Change "dry tropics and subtropics" to "mid-latitudes and the dry tropics" to be consistent with WG2-SPM, page 7, 3rd paragraph or to "semi-arid and arid areas" to be consistent with WG2-chap.3, page 3, line 14 and page 31, lines 16-17. (Government of Canada)	Rejected; effects are expected to be most pronounced, in particular due to lower adaptive capacity, in subtropical regions; mid-latitudes tend to have higher adaptive capacity

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SPM-1353	G-SPM-495	A	12	39	12	40	Please add ",dry temperate" after "tropics" (See SPM of WGII). (Government of China)	rejected – temperate does not go with subtropics
SPM-1354	G-SPM-496	A	12	39	12	40	One has to consider that these effects will also be felt in the non-dry topics and that in the case of Colombia and other Andean countries two causes of the vulnerability of water resources are missing: degradation of wetlands and melting of mountain glaciers. (Government of Colombia)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1355	E-SPM-783	A	12	40	12	40	Add: "...higher rates of evapotranspiration, MAINLY IN SMALL ISLANDS" (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	small islands are referred to in next section
SPM-1356	E-SPM-784	A	12	41	12	41	Insert 'in some low-latitude regions' (Michael Manton, Monash University)	Rejected – no reason given for change, seems to weaken the statement more than appropriate
SPM-1357	E-SPM-785	A	12	41	12	41	Add 'and higher and more variable temperatures' to this bullet. (John R. Porter, University of Copenhagen)	rejected – "more variable" is not clear
SPM-1358	E-SPM-787	A	12	41	12	41	"reduced water availability" in low latitudes is not entirely consistent with Table SPM-2 (Keith Shine, University of Reading)	Correct, but effects are expected to be most pronounced, in particular due to lower adaptive capacity, in subtropical regions; mid-latitudes tend to have higher adaptive capacity
SPM-1359	E-SPM-786	A	12	41			...water availability, and globally due to increase risk from extreme events (Monica Beatriz Wehbe, National University Rio Cuarto)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1360	G-SPM-498	A	12	42	12	42	Human health is also coupled to the individual ability to cope. As it is written now one might think that the health status and the ability to cope with climate change is solely dependent on which area you live in. (Government of Sweden)	Noted; but some generalisation is necessary; also, statements refer to particularly affected sector, not individuals
SPM-1361	E-SPM-788	A	12	42			replace "low adaptive capacity" with "less adaptive capacity" (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	rejected – this would require a comparison to other areas
SPM-1362	E-SPM-789	A	12	43	12		Add: "Human marginalized settlements in urban areas prone to floods and landslides" (Martha Yvette Munguía de Aguilar, Ministry of Environment and Natural Resources)	Rejected; this is intended to be a selection of the most affected

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								regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1363	G-SPM-502	A	12	44	12	44	Change the word "are" to "include". The list should not be considered comprehensive. (Government of Canada)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1364	E-SPM-790	A	12	44	13	7	Particularly vulnerable region might include desertification region, especially the ecoregion between desert and dry grassland (Guangsheng Zhou, Institute of Botany, The Chinese Academy of Sciences)	Rejected – regions refer to defined geographic regions, not ecosystems
SPM-1365	G-SPM-499	A	12	44	13	7	With regards to presenting a list of regions across the world particularly vulnerable to climate change, Latin America is a geographic area that should be included in any list of particularly vulnerable regions following the comments stated in the WG2 Chapter as well as in Topic 3, section 3.3 of the present Synthesis Report. In this regard, the irreversibility and seriousness of impacts in the cases presented in section 3.3 of SYR used to illustrate likely impacts of climate change in specific zones of Latin America and in critical aspects such as water availability, largely merit its inclusion on this list. In more specific terms, in zones of this region as stated in section 3.3 of Topic 3 document, water availability is projected to be affected due to precipitation pattern changes and disappearance of glaciers. Also, salinisation and desertification of agricultural land will cause serious harm if occurs as projected with a high confidence level. (Government of Chile)	Rejected – adaptive capacity is higher than in Africa and coastline is less vulnerable; also some temperate regions could experience some benefits
SPM-1366	G-SPM-500	A	12	44	13	7	This is quite a subjective list. As such the authors should also note that all regions will be effected by climate change and state that an assessment of all regions is included in the body of the report. (Government of Australia)	Rejected – the list has been carefully assembled. The statement that all regions have groups particularly at risk is added.
SPM-1367	G-SPM-501	A	12	44	13	7	Should it read Particularly vulnerable regions "are" or "include"? Should the Amazon, part of North America, or other regions also be mentioned, or are the four examples unique in their vulnerability? (Government of Sweden)	This is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment

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SPM-1368	E-SPM-791	A	12	44			Change "are" to "include" for same reasons as noted for line 32. (Donald Lemmen, Natural Resources Canada)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1369	G-SPM-503	A	12		21		There may be opportunities to further integrate these text to convey key messages in relation to causes for concern, emissions pathways and solutions (Government of Ireland)	Comment not clear – no change made.
SPM-1370	E-SPM-795	A	13	1	13	1	"high rates of projected warming" - this is the first time the rate of warming, rather than the warming itself, has been raised as an issue - I think this needs to be clarified. I don't think you are trying to say that a large warming, that happens slowly, is much better? (Keith Shine, University of Reading)	For adaptation, the rate of warming is indeed important
SPM-1371	G-SPM-504	A	13	1	13	2	Writing the sentence " The Arctic because of high rates of projected warming and its impacts on natural systems" would stress the basic phenomenon : a warming larger than the average value (Government of France)	This is stated in the existing text
SPM-1372	G-SPM-38	B	13	1	13	3	Arctic seems to be identified because of effect on natural systems, rather than on people, while Africa point seems more focussed on the human element. Is it right that effects in Arctic are only on natural systems and that the effects on those natural systems are widespread rather than on people (eg what about indigenous peoples). And that in Africa there is no natural system implication but only impact on people? Also, it would be helpful to highlight that in parts of Africa water and food resources are already stretched and therefore, any worsening would impact the populations more severely. (Government of United Kingdom)	The statements are not exclusive but point to the reason why the regions have been singled out.
SPM-1373	E-SPM-794	A	13	1	13	7	Include high mountain Andean ecosystems (tropical glaciers and paramos) (Germán Poveda, Universidad Nacional de Colombia)	Rejected; this is intended to be a selection of the most affected regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment
SPM-1374	E-SPM-792	A	13	1	16		The discussion on mitigation should be distinguished from the discussion on adaptation with a sub-sub heading. (Jon Barnett, University of Melbourne)	Rejected – condensed nature of SPM seems to make this unnecessarily complicated
SPM-1375	E-SPM-793	A	13	1			Should explicit reference to Mediterranean as highly vulnerable region and sea, due to drought and declining winter precipitation in some regions (particularly in the eastern Aegean and for	Rejected; this is intended to be a selection of the most affected

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							the countries of north Africa). Conversely, there is flooding during the winter in other regions (southern France, and Adriatic Sea particularly Venice laguna). Overall, there is sea level rise and higher temperature throughout the region, particularly in the summer. In some regions, there is a shift from a Mediterranean ecosystem characterized by wet mild winters and hot dry summers to more tropical ecosystem that is hot and dry year round.. As well as these changes, there are the factors of extensive coastal development, in-migration, the presense of local and transboundary contaminants, and ecosystem shifts. Please also note here the changes documented in the EU Green Paper on Adapting to Climate Change in Europe (discussed in general comments as well). (Magdalena Muir, Environmental and Legal Services Ltd.)	regions and sectors; others are not on a par in terms of confidence and relevance in a global scale assessment. Adaptive capacity of mediterranean region is much higher than that of e.g. Africa with regard to water stress.
SPM-1376	E-SPM-796	A	13	3	13	3	As you know capacity is a relative term. Many peoples in Canadian Arctic have low adaptive capacity due existing poor health status, low income, poor health infrastructure, etc. Maybe you need to indicate people in sub-Saharan region have "very low" adaptive capacity. (Peter Berry, Health Canada)	rejected – there is no objective scale to measure "low" vs "very low"
SPM-1377	G-SPM-505	A	13	3	13	3	This statement is not supported by model simulations. Replace "sub-Saharan region" by "dry tropics and subtropics". (Government of Netherlands)	rejected – the statement is specific to Africa, not to all subtropical regions
SPM-1378	E-SPM-797	A	13	3			After "adaptive" suggest adding "and coping" (Volodymyr Demkine, UNEP)	this is implied
SPM-1379	E-SPM-799	A	13	4	13	5	I suggest a small change in the sentence. Small and low islands, due to high exposure of population and infrastructure to sea-level rise and increased storm surges. The idea was that characteristics for damage in small island are related their altitude, not only with small size. Probably (coralline islands like atolls) could be incorporated between braquets as special case (Ricardo Anadón, Universidad de Oviedo)	In small islands, most economic activity is concentrated along the coast even if they have greater elevations in the centre
SPM-1380	G-SPM-506	A	13	4	13	5	Add reference EXTREME EVENTS, as follows: • Small islands, due to high exposure of population and infrastructure to sea-level rise, extreme events and increased storm surges (See for reference SPM WG II, p. 11). (Government of Cuba)	storm surges are extreme events
SPM-1381	E-SPM-798	A	13	4			change to : 'Small islands, particularly those where there are coral reefs, due to high exposure of population, ecosystem, and infrastructure to sea level rise, ocean acidification, and increased storm surges.' (M. James C. Crabbe, University of Bedfordshire)	too much detail for SPM
SPM-1382	G-SPM-507	A	13	8	13	8	The conclusion from WGII about there being vulnerable communities even in highly developed nations or regions is critical information for policymakers. Suggest including here some text from the WGII Technical Summary (page 60): "Within other areas, even	accepted

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							those with high incomes, some people can be particularly at risk (such as the poor, the young and the elderly) as can some specific activities and areas." (Government of Canada)	
SPM-1383	E-SPM-800	A	13	8			Strongly recommend adding text from SR 3.3 "In all regions, there are certain areas, sectors and communities which are particularly vulnerable" (Donald Lemmen, Natural Resources Canada)	accepted
SPM-1384	E-SPM-804	A	13	9	13	11	Maybe the summary should be divided in some logical way to separate this-century projections and projections further into the future. There was material earlier addressing likely impacts as far ahead as 2300, and now out of the blue here is another sentence that pertains to that time scale. They would be more useful if they occurred together. And actually, there's quite a bit of far-future information here, but even this boldface paragraph doesn't really reflect the importance or theme of what follows. (Noel Gurwick, Carnegie Institution)	Taken into account. Material has been reordered to create a more logical flow.
SPM-1385	E-SPM-805	A	13	9	13	11	Is it true that it is "very unlikely that there will be abrupt changes in the ice sheets in the 21st century". This seems to contradict line 22. (John Church, CSIRO)	Text deleted.
SPM-1386	E-SPM-806	A	13	9	13	11	If first sentence is dropped and second sentence "The probability of large ...confidence" is retained only the message is clearer . (Joyashree Roy, Jadavpur University)	Text deleted.
SPM-1387	E-SPM-808	A	13	9	13	11	I do not agree with the statement on ice sheets - it may be ok with respect to its effect on the MOC, but it is certainly not ok with respect to possible more rapid melting of the Greenland ice sheet affecting sea level. (Tom Crowley, Duke University)	Text deleted.
SPM-1388	E-SPM-810	A	13	9	13	11	A balanced and good assessment. Thank you. (Guoyu Ren, National Climate Center)	Text deleted.
SPM-1389	G-SPM-508	A	13	9	13	13	If the confidence qualifier is moved to the end, authors will have to make a positive supported statement with some confidence level rather than one that is denied. It's less confusing than quoting a result and then saying "unlikely": "Large abrupt climate changes due to changes in the large scale ocean circulation (MOC) or ice sheets are not expected over the 21st century [very likely]." (Government of United States)	Text deleted.
SPM-1390	G-SPM-509	A	13	9	13	15	Delete 9-11 and replace heading with line 13-15. (Government of Japan)	Text deleted. New headline sentence developed.
SPM-1391	E-SPM-801	A	13	9	13	18	These two paragraphs contain too strong denial statements with 'very unlikely', while they state that the slowing-down MOC is expected to change marine ecosystem productivity. It	The headline statement is deleted. The MOC assessment

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							would be likely that once the marine ecosystem and ocean CO2 uptake are changed, large abrupt climate changes occur. It should rather state that the feedback mechanisms between the climate change and the ecosystem change have not been quantified yet. (Motoyoshi Ikeda, Hokkaido University)	took into account the likelihood of carbon and other feedbacks.
SPM-1392	E-SPM-802	A	13	9	13	18	not sure the 'very unlikely' qualification fits the recent literature. There is considerable published evidence on abrupt climate changes in the recent past which suggests such changes will occur again, and these are related to shifts in oceanic circulation. Thompson, L. G., 2003: Long-term Andean ice core and glacier response records: placing the 20th century glacier retreat in perspective. Symposium on Mass Balance of Andean Glaciers: 21. Alley, R. B., 2004: Abrupt climate change. Scientific American, 291: 40-47. Alsos, I.G. et.al. 2007, Science. Thompson, L. G., Mosley-Thompson, E., Brecher, H., Davis, M., León, B., Les, D., Lin, P.-N., Mashiota, T., and Mountain, K., 2006: Abrupt tropical climate change: Past and present. Proceedings of the National Academy of Sciences of the United States of America (PNAS), 103: 10536–10543. Marlow, J. R., Lange, C. B., Wefer, G., and Rosell-Mele, A., 2000: Upwelling intensification as part of the Pliocene-Pleistocene climate transition. Science, 290: 2288-2291.etc. plus others cited in the extended IPCC report. It is rather 'very unlikely' that no abrupt change occurs. From the following lines this can be inferred but the writing makes it confusing. (Stephan Halloy, Conservation International)	The MOC statement is the assessment of WGI authors. Approved WGI SPM language.
SPM-1393	E-SPM-803	A	13	9	13	23	MOC should be defined, I doubt if many policymakers are familiar with this term. The MOC is also a global circulation feature not merely the Atlantic as could be inferred from the phrase "the MOC of the Atlantic Ocean". (Robert Molinari, University of Miami)	Approved WGI SPM language. The glossary defines the MOC in more detail.
SPM-1394	E-SPM-807	A	13	9	13	23	I recommend bringing this section on physical system responses before the section on impacts (i.e. insert at page 10 line 10), it is more logical this way. (Tom Crowley, Duke University)	Taken into account, The section on page 10 was moved to be just in front of the abrupt section in the SPM.
SPM-1395	E-SPM-811	A	13	9	13	23	"It is very unlikely ice sheets over the 21st century". This gives the impression that large scale abrupt possibilities are not relevant to policy makers. It should be possible to identify a range of risk estimates and confidence levels for these dynamical process to enable policymakers to respond. (Joe Ravetz, University of Manchester)	The ice sheet statement is deleted. These statements reflect the assessment of WGI and WGII on the risk of abrupt and irreversible changes.
SPM-1396	G-SPM-39	B	13	9	13	23	It would be helpful to clarify how the likelihood of such abrupt changes actually depends on stabilisation levels and what emissions reductions are made - ie the limit on temperature increase. Previous tables have shown that likelihood of abrupt events increases over 2 degrees. (Government of United Kingdom)	The new headline statement partly addresses this comment in relating the rate of change to the risk of these events. We can find little in the underlying documents to address this comment. Space limitations hinder adding much

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								more.
SPM-1397	E-SPM-809	A	13	9	13	30	delete lines (Hugo Beltrami, St. Francis Xavier University)	Rejected. This information is important to a policymaker as evidenced by there appearing in the WGI and WGII SPMs.
SPM-1398	E-SPM-812	A	13	10	13	10	change 'circulation (MOC)' to 'circulation such as MOC' (Suam Kim, Pukyong National University)	Approved WGI SPM language. Text seems clear.
SPM-1399	G-SPM-510	A	13	10	13	10	Write out meridional overturning circulation the first time MOC is cited. (Government of United States)	Text deleted. This comment is accepted later in the new text.
SPM-1400	G-SPM-512	A	13	10	13	10	The placement of MOC after "large scale ocean circulation" in this sentence suggests that MOC is an abbreviation for generic ocean circulation. Suggest rephrasing the sentence as follows: "... due to changes in the MOC (i.e., large scale ocean circulation) or ice sheets over the 21st century." (Government of United States)	Text deleted.
SPM-1401	G-SPM-513	A	13	10	13	10	Please spell out MOC in a footnote (Government of Sweden)	MOC is defined in the glossary.
SPM-1402	G-SPM-514	A	13	10	13	10	MOC is here understood as the large scale ocean circulation whereas it on page 4, line 13 is understood as the meridional overturning circulation. Consider a rewrite to make the text more readable. (Government of Norway)	Text deleted.
SPM-1403	G-SPM-515	A	13	10	13	10	Large scle ocean circulation can not be abbreviated as MOC (Government of India)	Text deleted.
SPM-1404	G-SPM-511	A	13	10	13	11	The sentence " The probability of ... with confidence" to be rewritten as " However, the confidence level is low in assessment of probability of large abrupt climate changes beyond 2100." (Government of India)	Text deleted.
SPM-1405	G-SPM-40	B	13	10			Please clarify that MOC is the "meridional overturning circulation" (Government of United Kingdom)	Text deleted.
SPM-1406	E-SPM-813	A	13	13	13	15	The topic sentence begins by suggesting a 'don't worry about this' conclusion but the next two paragraphs hold an entirely different message. The topic sentence should better reflect what follows. This first clause should include an 'although' at the beginning. That would solve the problem. (Noel Gurwick, Carnegie Institution)	Text reworded.

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SPM-1407	E-SPM-815	A	13	13	13	15	It would be helpful to include here an indication that the slowing down of the MOC is included in the projections of warming and how it has impacted on the climate of the northern hemisphere. (Roger Street, UKCIP-OUCE)	Text modified to make the meaning clearer. It now uses the same structure as the approved WGI SPM Language.
SPM-1408	E-SPM-814	A	13	13	13	18	Refer to "CO2 uptake and ocean acidification". Similarly, it might be useful to clarify what meant by "oceanic oxygen concentration and vegetation". It is assumed that referring to nutrient input, anoxic waters, and eutrophication. (Magdalena Muir, Environmental and Legal Services Ltd.)	Ocean acidification was not added due to space limitations. Terrestrial is added to make clear what vegetation is in view.
SPM-2138	G-SPM-6	D	13	13		the meridional overturning circulation (MOC)... (Government of Argentina)	Accepted.
SPM-1409	G-SPM-516	A	13	14	13	15	The authors should explain the implications of the slow down in the MOC and note (as in Topic 3 page 14) that any subsequent cooling of the Atlantic will be more than offset by greater atmospheric warming. (Government of Australia)	Space limitations hinder adding those details here.
SPM-1410	G-SPM-517	A	13	15	13	15	Give an order of magnitude of the MOC expected reduction (see topic 3, page 14, line 9) (Government of France)	Space limitations hinder adding those details here.
SPM-1411	G-SPM-35	C	13	15	13	18	" Should also include the impact of the MOC on the temperature distribution" (Government of Belgium)	Space limitations hinder adding those details here.
SPM-1412	G-SPM-518	A	13	16	13	18	It would be a mistake to infer that the threat to ocean ecosystems is due only to the MOC. What is more likely and certain is the increasing stability of the mode water and overall reduction in the ventilation of the deep water. Consider: "Overall changes in the oceanic circulation associated with warming, including a slowdown of the MOC, will impact marine ecosystem productivity, fisheries, ocean CO2 uptake, oceanic oxygen concentrations and vegetation [likely]." It is not clear what "vegetation" means here that is not included in ecosystem productivity. Drop it from the serial list. (Government of United States)	Rejected. Here we are only considering the impact of MOC changes.
SPM-2139	E-SPM-8	D	13	17	13	18	move "vegetation" from line 18 to line 17 after "fisheries" to keep the biological and chemical factors grouped together. (Stephen Hawkins, Marine Biological Association of the UK)	Terrestrail added before vegetation to make clear what is being discussed.
SPM-1413	G-SPM-520	A	13	20	13	20	Partial deglaciation of polar ice sheets ⇒ Partial deglaciations of polar ice sheets (Government of Republic of Korea)	Text seems clear.
SPM-1414	G-SPM-521	A	13	20	13	20	add after "would imply", "with medium confidence,". (Government of India)	Rejected; the medium confidence statement applies to the loss of ice; the

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								consequences to coastlines, should the melting occur, is very high confidence
SPM-1415	E-SPM-819	A	13	20	13	21	A partial deglaciation could be a very small one that does not imply major changes. A more specific indication of how much deglaciation would cause "major" changes is needed. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Space limitations hinder adding more details here.
SPM-1416	E-SPM-817	A	13	20	13	22	Need to also refer to lowlying coastal areas, lagunas and bays. (Magdalena Muir, Environmental and Legal Services Ltd.)	Space limitations hinder adding more details here
SPM-1417	E-SPM-816	A	13	20	13	23	These considerations about sea level changes were contradictories with modelled predictions (see table SPM-1). Causes of exclusion of rapid sea level change must be clearly explained. For instance, the sentence othat appear in the summary for polycimakers related to 4 to 6 m higher sea level 123000 years ago, with less atmospheric CO2 concentration than actual atmosphere, could be incoporated. (Ricardo Anadón, Universidad de Oviedo)	Space limitations hinder adding more details here. This bullet makes clear that the time scale is very different from the table (2100).
SPM-1418	E-SPM-818	A	13	20	13	23	It would be useful to provide the magnitude of these possible changes, for example the loss of the Greenland Ice Sheet will contribute about 7 metres of rise.. (R. Allyn Clarke, Fisheries and Oceans, Bedford Institute of Oceanography)	In the reordered new text, this statement is made just above.
SPM-1419	G-SPM-519	A	13	20	13	23	The statement of a temporal reference without an indication of the magnitude is not very helpful. Suggest to add "of several meters" before "on century time scales" in the last sentence. (Government of European Community)	Space limitations hinder adding more details. The text seems to clearly state the uncertainties. The full Greenland deglaciation statement is moved to be much closer to this statement in the new SPM text.
SPM-1420	E-SPM-820	A	13	21	13	21	replace "inundation" with "flooding" (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Text seems clear.
SPM-1421	G-SPM-522	A	13	21	13	23	These two sentences appear contradictory. This needs to be better explained. (Government of United States)	Space limitations hinder adding more details. The text seems to clearly state the uncertainties. The full Greenland deglaciation statement is moved to be much closer to this statement in the new SPM text.
SPM-1422	E-SPM-821	A	13	22	13	23	This is a worrying and rather odd statement. It echoes the temperature statement in WG1 SPM "Values substantially higher than 4.5 C cannot be excluded..". Surely some confidence statements corresponding to the others in the SYN should be given here. The interpretation of	Space limitations hinder adding more details. The text seems to clearly state the uncertainties.

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							the WG1 Report in the subsequent literature (e.g. Weitzman's interpretation of the PFDs in Box 10.2 in his catastrophe paper) argues that there is a 3-5% probability of an 8-10 degree C temperature rise above pre-industrial, given current trends towards a doubling or tripling of GHG concentrations over the next 40-50 years. Some indication of the consequences of such rapid rises in average temperatures on ice sheets and sea levels and of higher sea levels on coastal cities should be given since they are off the scale of table SPM2. What are the risks of higher sea levels, storm surges and major river floods coinciding in the populated megadeltas? Is the implication that flood catastrophes "cannot be excluded"? (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	The full Greenland deglaciation statement is moved to be much closer to this statement in the new SPM text.
SPM-1423	G-SPM-523	A	13	22	13	23	Strike the sentence: "Rapid sea-level rise on century time scales cannot be excluded." This is a bit soft for the SPM. There are many other impacts described in this and the IPCC reports from all WGs that "cannot be excluded", so what is the justification for picking this one? (Government of United States)	Rejected. This statement helps give balance to the uncertainty associated with land ice changes.
SPM-1424	G-SPM-524	A	13	22	13	23	A misleading phrase: "Rapid sea level rise on century time scales cannot be excluded." Yes, it can be rapid, but the expected magnitude is very modest (see table SPM-1, page 8). (Government of Russian Federation)	Table SPM-1 give projections out to 2100 without carbon feedbacks and without large changes in the land ice flows. This statement involves time scales beyond 2100 and notes the uncertainty associated with ice flow changes.
SPM-1425	G-SPM-525	A	13	23	13	23	It would be best to give brief reference as to the cause of rapid sea-level rise, since the current major contributor (steric) is obviously not going to become rapid: "be excluded because of ice sheet dynamics"? (from p. 8) (Government of United States)	Rejected. Land ice changes is the subject of this bullet. Space limitations hinder adding the suggested text.
SPM-1426	E-SPM-823	A	13	25	13	25	The meaning of "Gradual" is not clear here. (Shigeki Kobayashi, Toyota Research and Development Laboratories, Inc.)	Text deleted.
SPM-1427	E-SPM-824	A	13	25	13	25	I'm not comfortable with the concept of absolute irreversibility for the complex systems discussed. It would be better to add a time scale. For example, "irreversible for 1000's of years" or whatever an appropriate time would be. (David Jackson, McMaster Institute for Energy Studies)	The text is modified to make the meaning clearer. Extinction is irreversible at this point in time.
SPM-1428	G-SPM-526	A	13	25	13	25	This sentence makes little sense, in particular without a reference of magnitude. For instance, large changes in climate are virtually certain to lead to many irreversible impacts, even if they are gradual. (Government of European Community)	Text modified.

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SPM-1429	G-SPM-527	A	13	25	13	25	The use of the term “gradual” here is confusing. Try something more precise: “Climate change associated with sustained global warming would lead to irreversible impacts [likely].” (Government of United States)	Accepted.
SPM-1430	G-SPM-528	A	13	25	13	25	The sentence to be replaced by “There are some likely irreversible impacts”. (Government of India)	Text modified.
SPM-1431	G-SPM-529	A	13	25	13	25	The message here should be that climate changes are likely to lead irreversible impacts and that these will be more severe if the change is larger. This is not because the climate change is “gradual”. Hence, we propose the following rewrite: “Future climate changes are likely to lead to irreversible impacts with increasing severity for higher levels of global warming.” (Government of Norway)	Accepted.
SPM-1432	E-SPM-822	A	13	25	15	30	This seems that the authors need to evaluate this with the view that all/amost all the existing species were preasant when there was no ice ion the Arctic during the immediately prior interglacial, just 125,000 years ago. (John Everett, Ocean Associates, Inc.)	Rejected, see detailed assessment in WGII chapter 4. Fragmentation of landscapes, as well as warming rates, are not comparable between 125,000 years ago and what is projected for next 100 years
SPM-1433	E-SPM-831	A	13	27	13	27	“Species” refer to all living animals, plants, and so on? (Jacob Park, Green Mountain College)	Yes. Text seems clear.
SPM-1434	E-SPM-828	A	13	27	13	28	It would provide some context if the number of species assessed was included (i.e. 20-30% of x species assessed) (Roger Street, UKCIP-OUCE)	Space limitations hinder adding those details here.
SPM-1435	G-SPM-532	A	13	27	13	28	“There is medium confidence that approximately 20-30% of species assessed so far are likely to be at increasing risk of extinction if increases in global average warming exceed 1.5-2.5°C . . . {3.4}” According to the Introduction, “medium confidence” means a 5 in 10 chance and “likely” means <66% likelihood, so does that mean there is a 33% percent change that 20-30% of assessed species are at increasing risk of extinction if increases in global average warming exceed 1.5-2.5°C? And how many species have been “assessed”? This entire sentence is very fuzzy, potentially misleading, and essentially meaningless as a guide for policymakers. Another suggested rewrite: “Of the species assessed so far, approximately 20-30% may be at increasing risk of extinction if increases in global average warming exceed 1.5-2.5°C, and this risk increases for warming above 4°C. {3.4}” (Government of United States)	Taken into account in re-wording to avoid dual use of uncertainty language

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1436	G-SPM-533	A	13	27	13	28	<p>“There is medium confidence that approximately 20-30% of species assessed so far are likely to be at increasing risk of extinction if increases in global average warming exceed 1.5-2.5°C . . . {3.4}” According to the Introduction, “medium confidence” means a 5 in 10 chance and “likely” means <66% likelihood, so does that mean there is a 33% percent change that 20-30% of assessed species are at increasing risk of extinction if increases in global average warming exceed 1.5-2.5°C? And how many species have been “assessed”? This entire sentence is very fuzzy, potentially misleading, and essentially meaningless as a guide for policymakers. Another suggested rewrite: “Of the species assessed so far, approximately 20-30% may be at increasing risk of extinction if increases in global average warming exceed 1.5-2.5°C, and this risk increases for warming above 4°C. {3.4}”</p> <p>(Government of United States)</p>	Taken into account in re-wording to avoid dual use of uncertainty language
SPM-1437	E-SPM-825	A	13	27	13	30	<p>These statements need a stating of the baseline climate. Thus insert "over present climate" after "global average warming" (line 28). BTW, it would also be possible to have high confidence for the first part of this sentence, if it would be formulated as "up to 30% of species" and a warming range over present climate of "1 to 3°C would be given (see SYR Table SPM-2). However, I favor the current version, which attempts to give a narrower warming threshold. See also topic 5, p. 2, lines 16-21, which uses nicely a footnote (5) to do the job.</p> <p>(Andreas Fischlin, Integrative Biology - Systems Ecology)</p>	Figure SPM-6 clarifies baseline
SPM-1438	E-SPM-826	A	13	27	13	30	<p>The use of "increased risk of extinction" does not strike me as unduly vague. Even if we cannot quantify the precise level of additional risk, can we say "significant" or something similar?</p> <p>(Jacob Park, Green Mountain College)</p>	Rejected – follows assessed and approved confidence language from WGII SPM
SPM-1439	E-SPM-827	A	13	27	13	30	<p>The text in paragraph seems to be inconsistent with Table SPM-2. Propose to harmonise the text.</p> <p>(Michael Gytarsky, Institute of Global Climate and Ecology)</p>	Rejected – wording is different from Table entry, but exactly consistent with WGII SPM wording in text
SPM-1440	E-SPM-829	A	13	27	13	30	<p>I would reverse the order of these two clauses. That would make the underlying message more clear -- that the risk of large numbers of extinctions is very real, despite some uncertainties.</p> <p>(Noel Gurwick, Carnegie Institution)</p>	Rejected - seems appropriate to state impacts in order of increasing temperature
SPM-1441	E-SPM-830	A	13	27	13	30	<p>I do not understand the meaning of the expression "20-30% of species assessed so far", particularly because in the second part the sentence refers to ">40%" without saying whether it is the same group as before or not.</p> <p>(Marco Mazzotti, ETH Zurich)</p>	Wording is as used in WGII SPM; the 20-30% specifically includes the qualifier that the assessment only applies to species assessed, and not necessarily to all species

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1442	G-SPM-530	A	13	27	13	30	The mixture of confidence language, used in the vernacular, and split amongst clauses here lends itself to very different readings of the text. Further, the global warming is not specified as relative to now or to 1750. Finally, the idea of exceeding a "range" is confusing. Can the authors just give a number with range, then it is clear that there is uncertainty in this threshold. Is this what was meant: "Approximately 20-30% of species assessed so far risk extinction if global average warming exceeds 2°C [1.5-2.5°C] above pre-industrial/present [medium confidence, likely], and significant (>40%) extinctions would occur around the globe for warming above 4°C [high confidence] {3.4}" (Government of United States)	Taken into account in re-wording to avoid dual use of uncertainty language
SPM-1443	G-SPM-531	A	13	27	13	30	The combination of "medium confidence" and "likely" is unclear, and it is not inline with the IPCC Uncertainty Guidance Paper. The temperature change is compared to what level (this is not clear from the text). (Government of European Community)	Taken into account in re-wording to avoid dual use of uncertainty language
SPM-1444	E-SPM-832	A	13	28	9	28	Maybe I have missed the explanation of the reference 'year' before at another place in the SPM. But the 1.5 - 2.5 °C warming refers to the 'new IPCC base' 1980 - 1999', it is 2 - 2.5 degrees compared to preindustrial levels. Please find a formulation which states clearly and precisely what is to be said (Manfred Treber, Germanwatch)	Reference baseline clear from Figure SPM-6
SPM-1445	G-SPM-534	A	13	28	13	28	It seems unlikely that "percentage of species that are at increasing risk of extinction" is a robust quantity. The statement sounds alarming, but is it? Please quantify the risk of extinction and its increase. (Government of Netherlands)	Rejected – follows assessed and approved confidence language from WGII SPM. See WGII chapter 4 for details.
SPM-1446	G-SPM-535	A	13	28	13	28	Add the words 'above 1980-1999 levels' after the phrase 'exceed 1.5-2.5°C'. (Government of Canada)	Reference baseline clear from Figure SPM-6
SPM-1447	E-SPM-833	A	13	28	13	32	Firstly, is the (>40%) figure actual extinctions or species 'at increasing risk of extinction'? Secondly, 'at increasing risk of extinction' seems rather unspecific - presumably a species is at increasing risk of extinction if its population declines even slightly. Lastly, it would be more informative to compare like with like - x% of species will go extinct at a warming of 1.5-2.5C and y% will go extinct at a warming of 4C. (Nathan Gillett, University of East Anglia)	Rejected – follows assessed and approved confidence language from WGII SPM. See WGII chapter 4 for details.
SPM-1448	G-SPM-536	A	13	29			Since the term "significant" is not defined in the SPM, we propose that this sentence is rewritten as follows: " and high confidence of extinction of more than 40 percent of the species around the globe for warming above 4oC. {3.4}" (Government of Norway)	Rejected – follows assessed and approved confidence language from WGII SPM. See WGII chapter 4 for details. Significant is defined here within the text

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SPM-1449	E-SPM-838	A	13	33	13	33	Add 4. before Adaptation... (Annick Douguédroit, Université de Provence)	Accepted.
SPM-1450	G-SPM-538	A	13	33	13	33	The sentence needs to be rewritten as "Adaptive and Mitigative responses, the inter-". Options and responses are repetitive in a sense. (Government of India)	Taken into account; headline shortened
SPM-1451	G-SPM-540	A	13	33	13	33	Please clarify the division in two mitigation sections (1. "Adaptation and mitigations options, the interrelationship with sustainable development, and global and regional levels"; 2. "Long-term perspective, etc"), for example by adding introductory sentences saying that the former section addresses "what can be done in the immediate future" and the latter "what needs to be done in the longer term to stabilise Greenhouse gas concentrations". (Government of Netherlands)	Wording of introductory sentence revised.
SPM-1452	G-SPM-541	A	13	33	13	33	Inset "and" after "response". (Government of Australia)	Taken into account; headline shortened
SPM-1453	G-SPM-542	A	13	33	13	34	Header wording is awkward. Consider revising. (Government of United States)	Taken into account; headline shortened
SPM-1454	E-SPM-836	A	13	33	13	35	This title needs to be more grammatically correct and less confusing. I think just add an 'and' before 'the interrelationship' would help. (Noel Gurwick, Carnegie Institution)	Taken into account; headline shortened
SPM-1455	G-SPM-537	A	13	33	13	35	This is too long for a 'title'. We suggest just "Adaptation and mitigation" and that the detail of the scope and structure of the topic be removed from the title and set out briefly in the following text. (Government of New Zealand)	Taken into account; headline shortened
SPM-1456	E-SPM-834	A	13	33	14	14	To this section should be added the observation that societies have adapted continuously to decadal scale climate oscillations such as NAO and PDO, and the shorter term el Niño. Each of these has greater impact in temperature range and ecological effects, and occur faster than the forecast warming. (John Everett, Ocean Associates, Inc.)	Rejected. Too detailed
SPM-1457	E-SPM-835	A	13	33	16	20	This whole section needs to work better. As it stands, the writing jumps quickly from one point to another. I get no sense of a thread or of a framework in which these points fit. I think the writing team needs to start fresh on this section or else accept that few readers will be able to come away from it with a synthetic understanding of the material. (Noel Gurwick, Carnegie Institution)	Accepted. Section rewritten.
SPM-1458	G-SPM-539	A	13	33	16	20	The section on adaptation and mitigation is probably one of the most important sections for the policy makers. This section has a large potential for improvements. A table with	Rejected. Space limitations. See longer report.

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							examples of policies and instruments that have proven to have effect and that can be used for reduce emissions of climate gases could be one way to improve the section. (Government of Sweden)	
SPM-1459	E-SPM-837	A	13	33			Section "Adaptation and mitigation options and responses, the inter-relationship with sustainable development, at global and regional levels": This section lacks, in my view, clear statement on the contribution that SD can make to mitigation. I would suggest from WGIII, chapter 12: "Climate policy alone will not solve the climate problem. Making development more sustainable by changing development paths can make a major contribution to climate goals." (section 12.2.1, page 14 of the pre-copy-edit draft) (Harald Winkler, Energy Research Centre, University of Cape Town)	Accepted. Similar text added.
SPM-1460	G-SPM-41	B	13	33			Re-title this as "Managing the risks of climate change", then add a short para on the nature of adaptation and mitigation which : a) defines what they are b) notes that adaptation needs to deal with local risks, may have different options and needs to start soon, but that the scale of adaptation will grow with time and depend on the level of mitigation. Ultimately it has its limits c) notes that mitigation deals with the problem at source, will have limited impact in the short term but that action now is essential for the longer term reduction of the impacts of climate change. (Government of United Kingdom)	Rejected. Title approved by Plenary.
SPM-1461	G-SPM-544	A	13	36	13	36	Provide a short introductory section here that could include the existing sentence on lines 37-38 which is an orphan sentence, not introduced by any bolded heading. Suggest all or selected parts from: SYR, Topic 4, page 1 lines 7 to 21. With respect to what's new since the TAR, highlight the points that adaptation and mitigation have now been examined together in the AR4, that top down and bottom up economic studies for mitigation generally converge, and the reaffirmation of TAR conclusions re adaptation (the latter are stated in the SYR, Topic 4, page 2, lines 28 to 30). (Government of Canada)	Noted. Reworded and restructured (4&5)
SPM-1462	G-SPM-543	A	13	36	16	20	The material on adaptation and mitigation after page 13 needs to be better organized. It should start with the concept of risk management, followed by the need for both mitigation & adaptation, some detail on adaptation, some detail on mitigation, and some concluding comments about sustainable development. If this structure is followed, then the section on adaptation and mitigation at the bottom of page 13 should start with the risk management text from page 16 line 21 to page 17 line 37. This should be followed by the adaptation text on page 13 line 40 to page 14 line 14. It is then more logical to return to the mitigation text from page 17 line 39 through to page 21 line 11 which talks about the range of emission reductions needed to stabilize concentrations, plus some macro-	Noted. Reworded and restructured (4&5)

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							economic impacts and mitigation measures. This can be followed by the mitigation policies and instruments described from page 14 line 16 to page 15 line 35. Discussion of sustainable development can be drawn from page 15 line 21 to page 16 line 20, and page 21 lines 14 to 21. (Government of Australia)	
SPM-1463	E-SPM-841	A	13	37	13	37	Add: ".....can together reduce risks AND VULNERABILITIES of climate...." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Text revised and shifted.
SPM-1464	G-SPM-545	A	13	37	13	37	Replace "together" with "both" as mitigation and adaptation independently can reduce risks of climate change, that they can also act complementarily is then caught in the final clause of the sentence. (Government of Australia)	Taken into account, wording revised. Text shifted.
SPM-1465	E-SPM-839	A	13	37	13	38	This is much too reassuring a statement--first, there are some types of very important impacts that cannot be reduced; second, there is no indication of cost here; and third, there is no indication of how much reduction can occur--sure, a little can be done, but is it a significant amount and will it make much difference? A much more balanced statement is needed indicating that some types of impacts (like loss of species, which seems to already be started) are irreversible and some, such as the melting of Greenland, are so large that reducing the impacts one it starts would be astronomical. (Michael MacCracken, Climate Institute)	Rejected. Statement is not quantified. Wording revised for other reasons and shifted.
SPM-1466	E-SPM-840	A	13	37	13	38	I would suggest that the synthesis report should indicate that adaptation and mitigation are both essential and should not be seen as a choice (i.e. one or the other). (Roger Street, UKCIP-OUCE)	Text revised and shifted.
SPM-1467	E-SPM-842	A	13	37	13	38	"can together together reduce the "risks".... Earlier you discussed impacts. What is the difference? Can adaptation and mitigation reduce the impacts. From health perspective, I would rather reduce the impacts rather than the risks, so referring to impacts is much stronger. (Peter Berry, Health Canada)	Wording revised and shifted.
SPM-1468	G-SPM-42	B	13	37			Important to note that adaptation and mitigation are both necessary - neither are sufficient on their own (Government of United Kingdom)	Wording revised and shifted.
SPM-1469	E-SPM-843	A	13	40	13	40	What is the basis for the assertion that adaptation can reduce vulnerability? It is not explained in Topic 4. (Robert Siveter, IPIECA)	Noted. Adaptation reduces vulnerability per definition. See glossary.
SPM-1470	G-SPM-547	A	13	40	13	40	Insert "in certain sectors" after "can reduce vulnerability" (Government of Australia)	Rejected; adaptation reduces vulnerability in all sectors where it is successfully applied

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1471	E-SPM-844	A	13	40	13	41	This statement could be reworded, as any attempted adaptive activity that did not reduce vulnerability could be argued not to be an "adaptation", ie an action is only an "adaptation" if it actually works. The statement could be slightly amended in the following way: "There is high confidence that vulnerability can be reduced by adaptation, especially in the short term and where adaptation complements broader development initiatives." (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Noted. Text changed.
SPM-1472	E-SPM-845	A	13	40	13	41	This section starts optimistically but has some very important caveats that are a little bit buried. I recommend making it clear up-front that these important caveats exist . (Noel Gurwick, Carnegie Institution)	Noted. Text changed. Limits to adaptation are discussed in topic 5.
SPM-1473	E-SPM-846	A	13	40	13	41	It is not at all clear that adaptation can reduce vulnerability - the detailed wording of this sentence should be checked and revised. Adaptation definitely can reduce exposure and adverse climate change impacts. But vulnerability is another thing which has non-climatic sources. Migrating from flood plains may help to avoid detrimental effects of flooding but may make migrating people more vulnerable in the long run. The term "vulnerability" is used in a specific and problematic sense in the sentence and wording should be changed so as to make clear the intent of the statement. (Jouni Paavola, University of Leeds)	Rejected. Adaptation reduces vulnerability per definition. See glossary.
SPM-1474	E-SPM-848	A	13	40	13	41	Consider deleting "in the short term and". First it is not clear how "short-term" is defined. Secondly, adaptation reduces vulnerability at any time scale, its just that it is the ONLY means we have to reduce vulnerability over the next 2-3 decades. Finally, the resulting phrase "especially where it complements broader development initiatives" provides a strong statement about the importance of mainstreaming. (Donald Lemmen, Natural Resources Canada)	Rejected; adaptation options will run out in some sectors in the longer term
SPM-1475	G-SPM-546	A	13	40	13	41	The SPM states: "There is high confidence that adaptation can reduce vulnerability, especially in the short-term and where it complements broader development initiatives. {4.2}" Why is a confidence range applied to this, and why is it only "high confidence" (i.e., 90%)? Doesn't "adapting" to something necessarily reduce ones vulnerability to that something? (Government of United States)	Accepted.
SPM-1476	G-SPM-43	B	13	40	14	14	We note that the section on adaptation is weak. There are two key messages that were in the SPM WGII that have been omitted from the overall SPM: § the baseline adaptation situation (the SPM WGII report has two statements carrying similar messages): 'some adaptation is occurring now but on a limited basis. There are barriers, limits and costs, but these are not fully understood'. § It should be made clear that adaptation can reduce risks and impacts but very seldom reduces them to zero. Adaptation will help us deal with unavoidable changes in the short term but mitigation is the only way of avoiding dangerous climate change in the long term (i.e. both types of action are necessary – neither are sufficient).	Taken into account; revised wording includes baseline and cost. Limits to adaptation are addressed later.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of United Kingdom)	
SPM-1477	G-SPM-548	A	13	40	16	20	In section “Adaptation of mitigation options and responses, the interrelationship with sustainable development, at global and regional levels”, with regards to the paragraphs of how adaptation can reduce vulnerability and the linkages with development initiatives, it appears appropriate to place a word of caution since “adaptive capacity is intimately connected to social and economic development, but it is not evenly distributed across and within societies”, which is a statement presented in section 4.2 of Topic 4 document. Such and important statement should be included not only in the Topic 4 document, but also in the Summary for Policymakers (SPM) document, reflecting more appropriately that realistic possibilities of countries and less developed societies to deal with the effects of climate change, rely on counting with the appropriate tools to build adaptation and mitigation capabilities inside their countries. (Government of Chile)	Accepted
SPM-1478	E-SPM-847	A	13	40	21	31	It concerns Topics 4 and 5 but it is not possible to mention both numbers in the first column. The plan of the two topics appears confused to me. I suggest the following text organization. Next line after title (line 33) page 13, lines 37-38 (presentation hereafter as 13/37-38) in bold, 16/28-31 in bold. 4.1 Key vulnerabilities 16/33-47, 17/5-12, 17/27-32 (with the same presentation as the previous paragraphs), 17/34-37. 4.2 Adaptation and mitigation options and responses 13/40 to 14/14, 17/14-15, 17/17-19, 17/21-23, start on the second next line « Reliance...economic costs » in bold because it is fundamental for political choices, 15/20-22, 15/30 to 16/2, 16/4-20. Add a reference to Table SPM 3 of the WGIII on « Key mitigation and practices by sectors » which could be included in a box, because policymakers need practical information. Add 5 before « The long-terme...sustainable development » (16/23-26) 17/39-42, 17/1-4 in bold (Net aggregate impacts: suppressed). 5.1 Potential for mitigation of global greenhouse gas emissions over the coming decades (until 2030) 14/16 to 15/17, 15/24-28. 5.2 CO2 concentrations, peaking years for CO2 emissions, warming and sea-level rise 17/44 to 19/10 5.3 Cost of emissions reductions 17/39-42, 19/13 to 21/31 (Annick Douguédroit, Université de Provence)	Point accepted but dealt with differently. Structure 4 and 5 changed and clarified.
SPM-1479	G-SPM-549	A	13	41	13	41	Insert "Natural systems, however, have limited adaptive capacity" at the end of this sentence. (Government of Australia)	Rejected. Natural systems can also adapt. Limits to adaptation are discussed later in revised SPM.
SPM-2140	G-SPM-7	D	13	42	13		After the statement in bold letters, it should be added: “There are some impacts for which adaptation is the only available and appropriate response. Although many early impacts of climate change can be effectively addressed through adaptation, the options for successful adaptaton diminish and the associated costs increase with increasing climate change”. (Government of Argentina)	Rejected here. Limits to adaptation dealt with later in revised SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1480	E-SPM-849	A	13	43	13	2	Include the effects of starting with less productive ecosystems (i.e., that will reach the limits of adaptation sooner than highly productive ecosystems). (Elizabeth L Malone, Pacific Northwest National Laboratory)	Rejected. Too much detail.
SPM-1481	E-SPM-850	A	13	43	14	2	But some types of impacts we do not have good models for adapting to--a critical example being sea level. While responses have occurred in some locations that will work for a while (dikes in The Netherlands, tidal gates in the Thames), not all locations are suitable for such measures (e.g., barrier islands, coastal regions in locations subject to tropical cyclone storm surges, etc.). So, this very general statement is again much too reassuring--and seems to me to be contradicted by examples and statements in the later topic drafts. (Michael MacCracken, Climate Institute)	Limits to adaptation dealt with later in SPM.
SPM-1482	G-SPM-550	A	13	44			The word "planned" should be deleted. (Government of Norway)	Rejected. Meaning here is "planned".
SPM-1483	E-SPM-851	A	13	45	13	46	Please add after "initiatives": "such as disaster risk reduction". This suggestion is based on WGII Ch 20:8.1: "An international opportunity for mainstreaming adaptation into national, regional and local development processes has recently emerged with the community approach to disaster management adopted by the World Conference on Disaster Reduction held in Kobe, Hyogo, Japan in January 2005 (Hyogo Declaration, 2005)." (Silvia Llosa, International Strategy for Disaster Reduction)	Text changed. Not longer relevant.
SPM-1484	G-SPM-551	A	13	46	14	2	Suggest adding "poverty" to the list of non-climatic stressors to be consistent with WGII Chapter 20, Executive Summary. (Government of Canada)	accepted
SPM-1485	E-SPM-852	A	13	47	13	47	Add "conflict, spread of infectious diseases and market changes" to the non-climatic stresses (Siri Eriksen, University of Oslo)	taken into account, using list from WGII SPM
SPM-1486	G-SPM-552	A	13	47	13	47	Please change the word "exacerbated" to "made worse" or "increased", because "exacerbate" is not common to non-native speakers. (Government of Germany)	Rejected. Commonly used term.
SPM-1487	E-SPM-853	A	13				Vulnerable regions: While not regions, suggest adding: Forests in many regions: from warming, declining snowpack and increase in forest pests & Coral reefs: from warming, eutrophication, physical harm and overfishing. (Paul Epstein, Harvard Medical School)	Rejected. These are sectors, and they are mentioned in the preceding section.
SPM-1488	G-SPM-553	A	14	2	14	2	The loss of traditional coping skills does not seem to be featured in the body of the SYR, as such the authors should provide an example of how the loss of such skills can increase vulnerability. (Government of Australia)	Accepted, now using list as in WGII SPM.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1489	E-SPM-854	A	14	4	14	4	Add: "...to social and economic development AND ENVIRONMENTAL PROTECTION, but it is not..." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Rejected. Approved text.
SPM-2141	G-SPM-8	D	14	4	14	7	On adaptive capacity. Again social sectors, like the poor, the elderly, etc. are not mentioned in this paragraph, although they are referred to in the para's source (cf. Topic 4, page 2, lines 19-21) (Government of Argentina)	Rejected. Space constraints. Vulnerability of those groups is mentioned earlier now.
SPM-1490	E-SPM-855	A	14	4	14	14	Adaptative capacity is also linked to environmental protection. With this insertion line 4 would capture the sustainable development dimension. WG II report especially chapter 20 but also chapter 7 show the importance of disaster risk reduction as one of the low cost, high benefit-to-cost ratio adaptations. Therefore we propose adding "disaster risk reduction" in the list of examples. Also, the word "sectors" is best removed as sea level rise cannot be considered a sector. (Silvia Llosa, International Strategy for Disaster Reduction)	Rejected. Current list from underlying report.
SPM-1491	E-SPM-856	A	14	5	14	6	Very good point. I suggest embellishing it. (Noel Gurwick, Carnegie Institution)	Thanks. Turned into headline.
SPM-1492	E-SPM-858	A	14	5	14	6	Add: "...Even high adaptative capacity and COUNT WITH the necessary financial resources do not automatically translate:::" (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Text changed. Not longer relevant.
SPM-1493	E-SPM-857	A	14	5	14	7	Indeed, even if there are technical options, this does not mean they are possible. (Michael MacCracken, Climate Institute)	Noted.
SPM-1494	G-SPM-554	A	14	5	14	7	This sentence aims to correctly point out that effective action depends not only on the availability of economic resources but also on other factors such as governance. However, these factors are often included in the conceptualization of adaptive capacity. Hence, the current sentence is only correct with a very narrow conceptualization of adaptive capacity. A clearer formulation would be "Without good governance and effective institutions, economic resources do not automatically translate into effective action, as highlighted by the large damage caused by recent extreme climate events in high-income countries." (Government of European Community)	Noted. Is implied in new text, but not elaborated because of space constraints.
SPM-1495	G-SPM-555	A	14	5	14	7	Regarding, "Even high adaptive capacity and the necessary financial resources do not automatically translate into effective action on adaptation to climate change, variability and extremes." The constraints (why this does not automatically translate into effective action) need to be explained here. How can effective action be achieved? (Government of Japan)	Space constraints prevent elaboration of this point.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1496	G-SPM-558	A	14	9	14	9	“High confidence” or “agreement”? Confidence is used statistically (e.g., 95% confidence interval) consistently throughout the document. It seems unlikely that such a conclusion is statistically based but rather observed qualitatively and should be described as such (as consistent with line 14). (Government of United States)	Not a statistical meaning – see Introduction for definitions.
SPM-1497	E-SPM-859	A	14	9	14	11	This is not true in all countries, particularly in most developing countries (See lines 10 to 15 and lines 28 to 30 in page 2 of Intro 4). Moreover, costs are not just financial costs. Also, please note lines 4 to 6 in page 7 of Intro 3 indicate there is high confidence that adaptation for coastal regions will be more challenging in developing countries due to constraints in adaptive capacity and this means the challenges include costs. (Lourdes Tibig, Philippine Atmospheric, Geophysical and Astronomical Services Administration)	Rejected. Text doesn't say that this can be implemented everywhere. Also, text refers to low cost or high benefit/cost ration. The latter can equally apply in developing countries.
SPM-1498	E-SPM-860	A	14	9	14	11	This is much too reassuring. For sea level rise, for example, one might be able to protect certain land areas, but there will be tremendous disruption to estuaries as salt water moves upstream, etc.--how would one protect Chesapeake Bay--just put a levee across and make it a fresh water reservoir. Somewhere here it needs to be said that we can likely figure out how to adapt to small changes, but not to the large ones projected for mid-century and beyond. (Michael MacCracken, Climate Institute)	Text does not say that this applies everywhere and always. More discussion of limits to adaptation comes later.
SPM-1499	G-SPM-557	A	14	9	14	11	Correct wording because sea level rise is not really a sector. (Government of European Community)	Specific examples deleted.
SPM-1500	G-SPM-44	B	14	9	14	11	Are these really low cost options - defending against sea-level rise for example, potentially hugely expensive and may be better to retreat? Also infrastructure - fine if it's new infrastructure, but retrofitting is expensive. Please clarify. (Government of United Kingdom)	Accepted. Text amended.
SPM-1501	E-SPM-861	A	14	9	14	14	There is an inconsistency in this paragraph. In line 9 it states that adaptation options can be implemented at low cost; in line 14 it states that knowledge of the global costs and benefits are limited. Both statements cannot be true. (John R. Porter, University of Copenhagen)	Rejected. First statement is about local adaptation, 2nd about global costs.
SPM-1502	G-SPM-556	A	14	9	14	16	Not clear what the difference is between ‘high confidence’ and ‘high agreement.’ Are they interchangeable in meaning? Box I.1 does not clarify. (Government of United States)	Noted. See introduction. States clearly that they are separate approaches.
SPM-1503	E-SPM-864	A	14	10	14	10	Is sea level rise a sector? (Harald Winkler, Energy Research Centre, University of Cape Town)	Specific examples deleted.
SPM-1504	E-SPM-865	A	14	10	14	10	"sea level rise" is not a sector, nor is energy demand. Much adaptation in the health sector can be implemented at low cost and/or with high benefit-cost ratios given that it is largely incremental changes to existing policies/programs/initiatives (eg., smog alerts, better	Specific examples deleted.

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							emergency preparedness/management activities, enhanced infectious disease surveillance, more effective public education and outreach etc) (Peter Berry, Health Canada)	
SPM-1505	G-SPM-561	A	14	10	14	10	The word "sectors" in the sentence "...,in sectors such as sea level rise, agriculture, energy demand.....etc" seems to be less correct and could be replaced with "with respect to so the sentence reads: "...,with respect to sea level rise, agriculture, energy demand....." (Government of Norway)	Specific examples deleted.
SPM-1506	G-SPM-562	A	14	10	14	10	The authors should consider whether sea level rise can be properly characterised as a sector. (Government of Australia)	Specific examples deleted.
SPM-1507	G-SPM-563	A	14	10	14	10	Strike "sectors" and replace with "areas" (Government of United States)	Rejected. Specific examples deleted.
SPM-1508	G-SPM-565	A	14	10	14	10	Is it true that adaptation to sea level rise can be implemented at low cost, and/or with high benefit-cost ratios ? (Government of France)	Specific examples deleted.
SPM-1509	E-SPM-862	A	14	10	14	11	When referring the sectors where viable adaptation options can be implemented, please add "renewable energy". Reason: in order to reduce the adverse effects of dependence on single sources of energy, e.g. large hydropower dams, the use of alternative energy sources such as renewables is fundamental and can be implemented with high benefit-cost ratios. Topic 4, Page 3, Line 1, Table 4.1. (Christian Kjaer, European Wind Energy Association (EWEA))	Specific examples deleted.
SPM-1510	E-SPM-863	A	14	10	14	11	The item 'sea level rise' seems out of place in: "sectors such as sea level rise, agriculture, energy demand for heating and cooling, water resources management and infrastructure". It's hard to interpret 'sea level rise' as a 'sector'. (Claire Parkinson, NASA Goddard Space Flight Center)	Specific examples deleted.
SPM-1511	G-SPM-564	A	14	10	14	11	Rephrase: for example, "sea level rise" is not a "sector". Suggest: "...in sectors such as coastal communities (sea level rise), agriculture, energy (demand for heating and cooling), water resources management and infrastructure". (Government of Canada)	Specific examples deleted.
SPM-1512	G-SPM-566	A	14	10	14	11	"in sectors such as sea level rise, agriculture, energy demand for heating and cooling, water resources management and infrastructure." Actually "see level rise" is not a sector. (Government of Russian Federation)	Specific examples deleted.
SPM-1513	G-SPM-560	A	14	10	14	12	There is the statement that adaptation options can be implemented with "high benefit-cost ratios". Are these statements supported by empirical data from WG2, or is this a	Noted. Support in ES Chapter 17 WG2

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							qualitative judgment? (Government of United States)	
SPM-1514	G-SPM-559	A	14	10			We propose that "sea level rise" is substituted by "flood control". (Government of Norway)	Specific examples deleted.
SPM-1515	G-SPM-567	A	14	11	14	14	Unclear wording. Suggest to reword to "Empirical research shows that it is usually more cost-efficient to consider adaptation already in the design phase of long-lived infrastructure rather than to retrofit at a later date". (Government of European Community)	Text deleted for space reasons
SPM-1516	G-SPM-45	B	14	11	14	14	Page 14 line 11-14 - This sentence does not seem to be supported by the WG2 report or underlying chapters. Instead, it seems that the point refers to an issue to do with mitigation costs rather than adaptation costs. While the literature on mitigation costs seems to have advanced as far understanding that there are potential lock-in effects of investment in long-lived infrastructure which affect the costs of mitigation later down the line - making mitigation more expensive if it is not started early - this is not a clear result from the literature on adaptation costs. Hence the statement that knowledge about adaptation costs is limited. We suggest this sentence is removed here, and the information about lock-in incorporated with mitigation costs. (Government of United Kingdom)	Rejected. Text is from Executive Summary of WG2 Chapter 17. Examples removed because of space constraints.
SPM-1517	G-SPM-568	A	14	12	14	14	Unclear phrase: "Empirical research also suggests that higher benefit/cost ratios can be achieved by implementing many adaptation measures now compared with the costs of retrofitting long-lived infrastructure at a later date". (Government of Russian Federation)	Text deleted for space reasons
SPM-1518	G-SPM-569	A	14	13	14	13	Consider changing "compared with the costs of" to "rather than" (Government of United States)	Text deleted for space reasons
SPM-1519	E-SPM-866	A	14	13			Suggest replacing "adaptation measures now compared with the costs of" by "adaptive measures now than by" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text deleted for space reasons
SPM-1520	E-SPM-867	A	14	13			I do not understand the 'retrofitting...' concept. Maybe a definition needed in the Glossary? (Michel Rixen, NATO Undersea Research Center)	Text deleted for space reasons
SPM-1521	G-SPM-570	A	14	14	14	14	Insert " currently" between "is" and "limited" (Government of Republic of Benin)	Rejected. Sentence is clear.
SPM-1522	G-SPM-572	A	14	14	14	14	At the end of the paragraph, add the following sentence from Topic 4, lines 11-13 (p. 2): "However, the number of adaptation cost and benefit estimates at the regional and project levels for specific impacts is growing."	Rejected. Too detailed for SPM.

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							(Government of United States)	
SPM-1523	E-SPM-868	A	14	14			Issue of robust energy system being adaptive and mitigative could go here or on Page 15 (Paul Epstein, Harvard Medical School)	"Robust energy systems" not in text??
SPM-1524	G-SPM-571	A	14	14			delete the sentence "Knowledge ... is limited" since it somehow contradicts the beginning statement in the paragraph (line 9) of high confidence in viable adaptation options that can be implemented at low cost. (Government of Kingdom of Saudi Arabia)	Rejected. No contradiction: benefit-cost at local/project level is different from global level.
SPM-1525	E-SPM-876	A	14	16	14	16	bottom-up and top-down must be defined in a Box (Annick Douguédroit, Université de Provence)	See glossary
SPM-1526	G-SPM-573	A	14	16	14	16	What are bottom-up and top-down? Suggest adding a footnote to explain. (Government of United States)	See glossary.
SPM-1527	G-SPM-578	A	14	16	14	16	Please explain the meaning of high agreement and much evidence in a glossary or a footnote (Government of Sweden)	See introduction.
SPM-1528	G-SPM-579	A	14	16	14	16	It is not necessary in the SPM to present the results of bottom-up and top-down studies, as the results are very similar. We believe that it would be possible to mention only "economic studies". In this case, figure SPM-7 could be simplified to a single graph. Otherwise, it is necessary to explain in the SPM what top down and bottom up studies are. (Government of France)	Rejected. Agreement between methods is important.
SPM-2142	E-SPM-9	D	14	16	14	16	Bottom-up and top-down needs to be explained in this context as the definitions differ from the ecological definitions of food web control that are also tackled in this report. (Stephen Hawkins, Marine Biological Association of the UK)	See glossary.
SPM-1529	G-SPM-575	A	14	16	14	19	We thank the authors for avoiding the potential confusion in mitigation potentials between market potential and economic potential in this document. We would, however, suggest a clearer explanation of economic potential (as per Box SPM2 of the SPM of WGIII). (Government of Canada)	Brief further distinction between economic and market potential added. See glossary for more details (space constraints).
SPM-1530	G-SPM-576	A	14	16	14	19	suggest deleting "There is high agreement...top-down studies that" and inserting "from both bottom-up and top-down studies" at the end of the sentence. (Government of Republic of Korea)	Rejected. Approved SPM text.
SPM-1531	G-SPM-580	A	14	16	14	19	In this section, it appears appropriate to place together with the statement that "there is substantial economic potential for the mitigation of emissions over the coming decades that could offset the projected growth of emissions" that this potential of mitigation	Rejected. Agree conceptually, but technology transfer in topic 5 in approved Plenary outline.

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							allowing a significant contribution to reductions on global greenhouse gas emissions, will only be reached on a world scale basis whether technology transfer from developed countries to the rest of the world occurs on a massive basis and as soon as possible. This concept is included on the SYR, page 20 lines 17-18, where it is stated that stabilisation levels can be achieved by deployment of portfolio of technologies, assuming that appropriate and effective incentives are in place for development, acquisition, deployment and diffusion of technologies and for addressing related barriers, albeit only related with the long term perspective. The selected approach in the document to relate such an important concept only to the long-term perspective does not appear to keep pace with the way several regions of the world are currently developing. (Government of Chile)	
SPM-1532	G-SPM-46	B	14	16	14	23	Although the graphs do show economic potential at different costs per ton of CO2, it would be useful to make some reference within the text as to what amount of emission reduction particular carbon prices by 2030 can imply - perhaps with reference to a set of emissions pathways (e.g. what carbon prices might be required to ensure emissions peak by 2020, or halve by 2030, etc?). There may be some creative ways to interpret the tabular information in the text, which are also different to WG2 text, and therefore interesting and useful to policy-makers. It would also be important to make clear what relationship these economic potentials have to mitigation costs, because mitigation costs are then mentioned later on Page 15 line 32, but with no context. (Government of United Kingdom)	Details found in revised Table on mitigation potentials.
SPM-1533	E-SPM-873	A	14	16	14	29	Emphasis on economic potential for mitigation of global greenhouse gas emissions is critical, especially for impact on project emission growth below current levels. How such economic potential could affect state/regional GDP in a positive way is not established. (Peter Liotta, Pell Center for International Relations and Public Policy)	Noted.
SPM-1534	G-SPM-574	A	14	16	15	17	We think that the main message and figures in this paragraph focus too much on technical aspects as regards bottom-up and top-down studies, without sufficiently explaining these terms. The message should focus more on the main results - for example by synthesizing the information in figure SPM-7 in one or two sets of columns and including relevant uncertainty ranges. (Government of Norway)	See glossary. See new table.
SPM-1535	E-SPM-869	A	14	16			what are bottom-up and to-down? (Peter Haas, University of Massachusetts)	See glossary.
SPM-1536	E-SPM-870	A	14	16			Top down and bottom up need to be defined. (Robert Molinari, University of Miami)	See glossary.
SPM-1537	E-SPM-871	A	14	16			replace the word "much" with the word "medium" to be consistent with wording in line 7 of page 8 in the SPM for WGIII	Rejected. Approved SPM text

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Mustafa Babiker, Saudi Aramco)	
SPM-1538	E-SPM-872	A	14	16			Page 14, line 16: replace the word "much" with the word "medium" to conform to the wording in line 7 of page 8 of the SPM for WGIII. (Mohammed Alfehaid, Ministry of Petroleum)	Rejected. Approved SPM text
SPM-1539	E-SPM-874	A	14	16			Delete "from both bottom-up and top-down studies". It is unnecessary and will not mean anything to most readers. (Donald Lemmen, Natural Resources Canada)	Rejected. Meaningful for many others and an important new finding.
SPM-1540	E-SPM-875	A	14	16			Bottom-up and top-down studies in this context requires an explanation without having to go to the glossary. (Robert Jefferies, University of Toronto)	Rejected for space reasons, reference to glossary.
SPM-1541	G-SPM-577	A	14	16			replace the word "much" with the word "medium" to conform to the wording in line 7 of page 8 of the SPM for WGIII. (Government of Kingdom of Saudi Arabia)	Rejected. Approved SPM text.
SPM-1542	E-SPM-877	A	14	17	14	17	What does "substantial economic potential" mean? Someone might make profit? Our economy won't collapse? Need to be clear. (Peter Berry, Health Canada)	Rejected. Approved SPM text. Definition in glossary.
SPM-1543	G-SPM-581	A	14	17	14	17	The reader should be provided with the definition of economic potential, at least in a footnote (such as footnote 3, page 4, topic 4). The presentation in the SPM of the economic potential only is questionable, as the market potential is more realistic. (Government of France)	See glossary. No quantitative information on market potential available.
SPM-1544	G-SPM-47	B	14	17			Include the words "and technical" in "there is substantial economic potential for the mitigation..." as technical reflects the availability of such things in the markets, and economic tends to refer to its cost-effectiveness - both of which are appropriate in this context. (Government of United Kingdom)	Rejected. Approved SPM text. Analysis focuses on economic potential.
SPM-1545	E-SPM-879	A	14	18	14	18	...coming decades add (until 2030) (Annick Douguédroit, Université de Provence)	Rejected. Approved SPM text.
SPM-1546	G-SPM-582	A	14	18	14	18	Introduce the words "... coming decades in all sectors that could ... " (Government of Switzerland)	Rejected: approved SPM text.
SPM-1547	G-SPM-583	A	14	18	14	19	Consider changing "the projected growth of global emissions" to "their projected growth". (Government of United States)	Rejected: approved SPM text.
SPM-1548	E-SPM-878	A	14	18			Replace "Offset" with "Limit". (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Rejected. Approved SPM text.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1549	E-SPM-880	A	14	19			Stop after "projected growth of global emissions". I simply do not believe that there is much agreement that we can reduce emissions below current levels - if you include this you are asking for trouble! (Tom Crowley, Duke University)	Rejected. Approved SPM text and change not consistent with WGIII assessment.
SPM-1550	G-SPM-584	A	14	20			There is no mention of the evaluation which has been made by WG-3 of the range of the costs of carbon which could lead to a stabilisation at a low GHG concentration. We suggest to add here the following sentence from WG 3 SPM : "Modelling studies show that carbon prices rising to 20 to 80 US\$/tCO ₂ -eq by 2030 and 30 to 155 US\$/tCO ₂ -eq by 2050 are consistent with stabilization at around 550 ppm CO ₂ -eq by 2100. For the same stabilization level, studies since TAR that take into account induced technological change lower these price ranges to 5 to 65 US\$/tCO ₂ eq in 2030 and 15 to 130 US\$/tCO ₂ -eq in 2050". (Government of France)	Taken into account in revision of later section.
SPM-1551	G-SPM-587	A	14	21	14	21	Is "economic potentials" clear? It is used above with "for mitigation" which might be better here. (Government of United States)	See glossary.
SPM-1552	E-SPM-882	A	14	21	14	22	'Top-down' and 'bottom-up' are jargon terms. Explain them. (John R. Porter, University of Copenhagen)	See glossary
SPM-1553	E-SPM-884	A	14	21	14	23	I believe this sentence is not enough to explain figures SPM-6 and SPM-7. (Marco Mazzotti, ETH Zurich)	Accept. 2 nd Figure replaced by table.
SPM-1554	G-SPM-585	A	14	21	14	23	This is unnecessarily repetitious of the material in the chapeau text immediately above.+ (Government of New Zealand)	Accepted.
SPM-1555	G-SPM-586	A	14	21	14	23	It is important to explain to readers what is meant with the term "economic potential". Therefore, some text from the Box 2 in page 10 of the SPM of WG3 could be added, e.g. the three first paragraphs. Another way would be to add the footnote 3 of the page 4 of Topic 4. (Government of Finland)	See glossary.
SPM-1556	G-SPM-588	A	14	21	14	23	If there are "considerable differences at the sectoral level", then the agreement at larger scales could be just fortuitous and the result is not very robust. (Government of United States)	Noted. WGIII TS p76/77 shows that source of disagreement is mainly different sector definitions.
SPM-1557	E-SPM-883	A	14	21	15	17	There needs to be some explanation of the quantities <20, <50, etc in Figures SPM-6 and SPM-7. It may be obvious to climate change scientists but many lay people would struggle to explain what they mean. (George Walker, Aon Re Asia Pacific)	Wording and captions revised to clarify.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1558	E-SPM-881	A	14	21	15	45	What does bottom up and top down exactly mean in this context, what does <0 \$ means in bottom up studies(fig. 4.1)? Layout is also different from other chapters (see notes for Figure 4.2) These needs better explanation esp. for policy makers (Markus Erhard, European Environment Agency)	See glossary
SPM-1559	E-SPM-885	A	14	22	14	22	change 'Figures SPM-6 and SPM-7' to 'Figure SPM-6' (Suam Kim, Pukyong National University)	Accept. 2 nd Figure replaced by table.
SPM-1560	G-SPM-589	A	14	22	14	22	Insert the word “aggregated” between the words “studies” and “across”. (Government of United States)	Text amended.
SPM-1561	E-SPM-886	A	14	23	14	23	Add "however, there are limits to adaptation" (Siri Eriksen, University of Oslo)	Rejected. Limits to adaptation in topic 5.
SPM-1562	G-SPM-590	A	14	23	14	23	Insert a new paragraph at the end of line 23: “The economic potential is generally greater than the market potential. Studies of market potential can be used to inform policymakers about mitigation potential with existing policies and barriers.” (Government of United States)	Accepted 1 st part. Rejected 2 nd sentence (space)
SPM-1563	G-SPM-591	A	14	23	14	23	Explicit, for the benefit of readers not familiar with figures interpretation, some of the major conclusions which can be drawn from figures SPM 6/7, e.g. " By 2030, a CO2 ton price of \$ 100 would permit a reduction of the yearly emissions by 15 to 30 Gt CO2 eq." (Government of France)	Noted. Revised table demonstrates this.
SPM-1564	G-SPM-592	A	14	24	14	24	Some additional wording on sectoral potential might be useful. Certainly concerning the large win win potential in the bottom up studies indicating that emissions can be reduce at no cost up to around 6 giga Ton CO2-equi by 2030. This sectoral detail could also include information on potentials in both developed and developing countries. (Government of European Community)	Rejected due to space constraints
SPM-1565	E-SPM-888	A	14	24	14	25	Figure SPM-6, the legend: “Non-OECD/EIT” seems to be a misprint. (Volodymyr Demkine, UNEP)	Figure will be improved.
SPM-1566	E-SPM-887	A	14	24	15	17	The unit GtCO2-eq is not clear and could be misleading, so as the cost. A fundamental question is why emission is measured by CO2 in the fourth report, whereas it was measured by C in the third report. (Motoyoshi Ikeda, Hokkaido University)	See glossary.
SPM-1567	E-SPM-889	A	14	27	14	27	The economic potential diagram is unclear to non-experts and needs further clarification e.g. (Joe Ravetz, University of Manchester)	Caption extended.
SPM-1568	G-SPM-593	A	14	27	14	29	It might be informative to point out that reductions in the energy supply sector due to efficiency improvements in the other sectors are attributed to these other sectors, in order to clarify that emissions in the energy supply sector seem relatively low.	Included in revised caption

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							(Government of European Community)	
SPM-1569	G-SPM-594	A	14	28	14	28	Explicit what is the longer report quoted in the parenthesis (Government of France)	Revised caption obviates need for this reference
SPM-1570	G-SPM-595	A	14	29	14	29	The caption should be complemented by the indications given in figure 4.2, rather than referring to this figure (Government of France)	Caption has been expanded.
SPM-1571	E-SPM-890	A	14	34	14	35	Without clear description of life style changes, the statement is misleading so that any type of life style changes may be considered to play a secondary role in mitigation. (Motoyoshi Ikeda, Hokkaido University)	Statement does not say lifestyle changes are unimportant, it only says they are not included
SPM-1572	G-SPM-48	B	14	40	14	41	There is confidence that adaptation can reduce vulnerability for humans, but not for ecosystems (stated later on page 17 line 21-23. Think this statement is misleading without this caveat. (Government of United Kingdom)	Misplaced comment. Ecosystems also have adaptive capacity; limits may be reached sooner (as discussed later).
SPM-1573	E-SPM-891	A	14				In Fig. SPM-6 explain the error bars. The legend for this Figure is cryptic. (Robert Jefferies, University of Toronto)	Caption extended
SPM-1574	E-SPM-892	A	14				Figures SPM-6 is obscure to me. What is the x-axis exactly. Caption should be expanded here. Why is the transport plot different (this is only explained later on in topic 4)? (Michel Rixen, NATO Undersea Research Center)	Caption extended
SPM-1575	E-SPM-893	A	14				Figure SPM-6: This figure is too difficult to understand. It must be either redrawn or explained better in the caption, perhaps both. (Jon Egill Kristjansson, University of Oslo)	Caption extended
SPM-1576	E-SPM-894	A	14				Figure SPM-6: The legend to this figure does not describe it and the figure cannot be understood from the legend alone. I suggest 'Best estimate and ranges of mitigation potential (Gt CO ₂ -eq) for economic sectors given different market prices of a tonne of CO ₂ (horizontal axis). Data are presented for mitigation by OECD, EIT, non-OECD/EIT countries and the global total.' Need to define EIT - assume it means 'economies in transition'. (John R. Porter, University of Copenhagen)	Caption extended
SPM-1577	E-SPM-895	A	14				Figure SPM-6: tfigure spm-6 isn't very obvious (Peter Haas, University of Massachusetts)	Caption extended
SPM-1578	E-SPM-896	A	14				Figure SPM-6: it is impossible to understand this figure with such a short description and discussion. (Marco Mazzotti, ETH Zurich)	Caption extended

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1579	E-SPM-897	A	14				Figure SPM-6: As a natural scientist, I am not fully familiar with such plots. Whilst I think I understand them (e.g. for energy, emissions of 2 GtCO ₂ can be avoided by spending less than \$20 per tonne CO ₂), what is unclear is whether the bars are cumulative or not. i.e. whether the \$100 bar includes the \$20 and \$50 bars or whether it is the emissions that can be avoided by spending between \$50 and \$100 per tonne. (Keith Shine, University of Reading)	Caption extended
SPM-1580	E-SPM-898	A	14				Figure SPM-6: why is there no negative cost bar equivalent to those included in Figure SPM-7 on the following page? If both include bottom-up studies which identify large negative cost opportunities, this conclusion should be shown consistently (Alan Miller, International Finance Corporation - CESEF)	Figure approved SPM
SPM-1581	E-SPM-899	A	14				Figure SPM-6. This figure needs more explanation in the caption (presumably this comes from the WG3 SPM, where more background was given in the text). Firstly the units should be GtCO ₂ -eq / yr - the 'per year' is not stated clearly anywhere. Secondly, 'economic mitigation potential' is not defined. This could be replaced with 'reduction in greenhouse gas emissions'. Thirdly, why are the mitigation potentials for buildings much better constrained than for any other sectors? Lastly, the information about total emissions given in the caption to Figure SPM-7 should be given here as well, to allow the reader to set these reductions in context. (Nathan Gillett, University of East Anglia)	Caption extended
SPM-1582	E-SPM-900	A	14				Figure SPM-6. I cannot understand this figure, and you should certainly not expect a policymaker to go scrambling back to to some section in a longer report (not even specified!) to figure it out. Why do you switch from GtC in the physical chapter to Gt CO ₂ now? This is "very likely" to be overlooked by policymakers! (Tom Crowley, Duke University)	Caption extended
SPM-1583	E-SPM-901	A	14				Figure SPM-6. This needs a slightly expanded legend. It is hard to infer any meaning without reading the more detailed report. Also, define acronymns (EIT, OECD) in the legend (Knut Nadelhoffer, University of Michigan)	Caption extended
SPM-1584	E-SPM-902	A	14				Figure SPM-6 caption. Needs much more explanation. (Joanna Haigh, Imperial College)	Caption extended
SPM-1585	G-SPM-596	A	14				In the Figure SPM-6 the panel for "Buildings" has very low uncertainty ranges. The corresponding figure (4.2) has larger uncertainty ranges for "Buildings". (Government of Finland)	Accepted. Figure will be replaced with updated figure.
SPM-1586	G-SPM-597	A	14				In Figure SPM-6, what does 'EIT' stand for? Spell out acronymns (economies in transition, etc.) in the caption. (Government of United States)	See appendix
SPM-1587	G-SPM-598	A	14				Figure SPM-6: This figure is the old version from an earlier draft of the WG3 SPM. It should be replaced with the updated figure found at SYR Fig 4.2. The figure should also	Caption extended and figure updated.

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							include the caveats on the sectoral results found at Fig 4.2. (Government of Australia)	
SPM-1588	G-SPM-599	A	14				Figure SPM-6 needs more explanation. The caption should explain the different costs of carbon, both that this was a factor in the analyses and what the three values represent or how they were chosen. Full captions and notes from the WG3 SPM should be included to explain other details. (Government of United States)	Caption extended
SPM-1589	G-SPM-600	A	14				Figure SPM-6 is very difficult to understand. The caption is "Estimated economic potential by sector in 2030 from bottom-up studies, compared to the respective baselines assumed in the sector assessments (see longer report for details)". Additional explanation and references were added to this figure in the WG3 SPM. Recommend that similar explanation be provided here. WG3 Figure SPM-6 stated that "a full explanation of the derivation of this figure is found in 11.3". (Government of United States)	Caption extended
SPM-1590	G-SPM-601	A	14				Figure SPM 6-7: These figures are valid under the assumption that carbon pricing is introduced, however there is no description about carbon pricing here (it is first mentioned on p.15, line 21). The definition of carbon pricing should be stated before Figure 6-7. (Government of Japan)	Rejected. There are other assumptions as well, and carbon pricing is mentioned later.
SPM-1591	G-SPM-602	A	14				Figure SPM 6.Add after "World total" a footnote "Valid for transport only where differentiation by regions is not available" (Government of France)	Caption extended
SPM-1592	G-SPM-603	A	14				Fig. SPM-6: what mean numbers at X-axis? (Government of Russian Federation)	Rejected. Is included in Figure.
SPM-1593	G-SPM-604	A	14				Fig SPM-6. We propose that the y-axis is labelled GtCO ₂ -eq/year (Government of Norway)	Accepted. Figure amended.
SPM-1594	G-SPM-605	A	14				Fig SPM-6. We propose that the figure should have a title (in bold text), for instance "Economic mitigation potential by sector in 2030 from bottom-up studies as a function of carbon price" (Government of Norway)	Accepted.
SPM-1595	G-SPM-606	A	14				Fig SMP-6. The explanation on the right side of the figure of the colors used in the figure seems to have an error; The light purple color for "World total" seems not to be consistent with the use of the colors in the figure. The same applies to the corresponding figure in Topic 4 of the Synth report (Government of Norway)	Rejected. Dark blue for global only for transport.

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SPM-1596	E-SPM-5	B	14				Figure SPM-6 - the figure is not very clear and needs to have more information on what the bars represent. It would be also useful to have a description on what the x-axis represents and a more accurate reference of "longer report". (Jane Hupe, ICAO)	Caption extended
SPM-2143	E-SPM-10	D	14				Figure SPM-6. The legend should be written in full for non-economists who do not know what e.g. Non_OEDC/EIT represents. (Stephen Hawkins, Marine Biological Association of the UK)	Caption extended
SPM-1597	G-SPM-607	A	15	1	15	17	Give units as annual emissions rates by including the "per year" in the figure labels and the caption. (Government of United States)	Accepted. Figure replaced by table with better text.
SPM-1598	G-SPM-608	A	15	15	15	15	which economic potential is meant? the "mitigation" potential? Please clarify. (Government of Germany)	Accepted. Figure replaced by table with better text.
SPM-1599	G-SPM-609	A	15	15	15	15	Add "mitigation" between "economic" and "potential". The new sentence now reads, "Global economic mitigation potential in 2030 estimated from bottom-up and top down studies." (Government of Japan)	Accepted. Figure replaced by table with better text.
SPM-1600	E-SPM-903	A	15	15	15	17	This conclusion must necessarily depend on what one assumes about issue of equity, technological development, political choices and operation, etc.--at least some of the assumptions need to be indicated. (Michael MacCracken, Climate Institute)	Unclear. No conclusion in these lines (Figure)
SPM-1601	E-SPM-904	A	15	15			Figure SPM-7: What is the difference between top down and bottom up studies? I wonder if policymakers would know this.. (Gabriele Hegerl, Duke University)	See glossary
SPM-1602	E-SPM-905	A	15	19	15	23	Should mention here the importance of financial incentives, and the need for adequate information campaign and training of financial institutions if want to have more natural investments in cost-effective technologies that the financial sector are unfamiliar with (i.e. energy efficient investments) (Philippine de T'Serclaes, International Energy Agency)	Noted. Text amended for clarification.
SPM-1603	G-SPM-611	A	15	20	15	20	This is the only point at which a cost to carbon emissions is mentioned in the text of this document. This is a key point to make, and was very strongly referenced in the SPM of WGIII. Carbon prices are key to reducing emissions - if there is no cost to emitting, most people and organizations will see no incentive to reduce emissions. We would like to see this message included. (Government of Canada)	Accepted. New text provides more detail.

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SPM-1604	G-SPM-612	A	15	20	15	20	This is the only point at which a cost to carbon emissions is mentioned in the text of this document. This is a key point to make, and was very strongly referenced in the SPM of WGIII. Carbon prices are key to reducing emissions - if there is no cost to emitting, most people and organizations will see no incentive to reduce emissions. We would like to see this message included. (Government of Canada)	Accepted. New text provides more detail.
SPM-1605	G-SPM-614	A	15	20	15	20	Spell out RD&D (Government of United States)	Accepted.
SPM-1606	E-SPM-906	A	15	20	15	22	What is not included here is that all of this needs to be done with a sense of urgency that is not typical of governments anywhere--the problem is unprecedented and very broad and so very hard to grapple with. This sentence is essentially purely academic--a bit like telling a large gathering of many types of poor people who have no experience traveling abroad that there are lots of routes for getting from Beijing to Qatar--it is not all that easy to do. (Michael MacCracken, Climate Institute)	Rejected. IPCC is not policy prescriptive.
SPM-1607	E-SPM-907	A	15	20	15	22	subsidies to clean energies, (Germán Poveda, Universidad Nacional de Colombia)	Rejected. List from approved SPM.
SPM-1608	E-SPM-909	A	15	20	15	22	I agree that there are a wide variety of policy options, but that doesn't really mean anything unless you can say something about their effectiveness in reducing emissions. (Katherine Casey Delhotal, RTI International)	Noted. More detail in longer report.
SPM-1609	G-SPM-613	A	15	20	15	22	The list of national policies and instruments is selective. It's unclear why certain ones were highlighted and others not. Why are the others the italicized titles from the SPM— i.e., "Voluntary agreements" whereas "carbon pricing" is listed instead of "Taxes and Charges?" Please replace. In addition, "information" is not the italicized topic; "Information Instruments" is (a term that may be unclear to a general audience). (Government of United States)	Accepted. New text provides more detail. Copy full list of instruments from WG3 SPM.
SPM-1610	G-SPM-615	A	15	20	15	22	Insert in this list of policies and instruments "financial incentives". (Government of United States)	Accepted.
SPM-2144	G-SPM-9	D	15	20	15	22	Instead of "carbon pricing" put economic instruments, government funding. (Government of Argentina)	Taken into account in rewrite. Option for examples to be discussed.
SPM-1611	E-SPM-908	A	15	20	15	35	It should have been highlighted that for emerging technologies, appropriate public policies needed to be adequately articulated with market and/or fiscal instruments (+regulation and labelling) in order to accelerate their apparitionj in the market. I would suggest to add at the end of line : "it is therefore important to be able to articulate the different policies and measures together in order to reach the desired goal, paying attention to national circumstances as well"	Rejected. Too detailed and not in underlying text.

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							(Jean-Yves Caneill, EDF)	
SPM-1612	G-SPM-610	A	15	20	15	35	This part remains vague on carbon pricing. The SPM WG III was much more specific and also pointed clearly to two relevant policy instruments, i.e. tradable permits and taxes and charges. (Government of European Community)	Accepted. New text provides more detail. Copy full list of instruments from WG3 SPM.
SPM-1613	G-SPM-49	B	15	20	15	35	The chapeau and the text underneath it in this sub-section do not seem to relate well to each other. The text does not explain what impact national policies can have on influencing energy infrastructure investments, and what national policies can make early investment in low-carbon technologies attractive. As it reads right now, it seems to suggest that governments can create incentives for mitigation action, but there is little evidence to suggest they will lead to mitigation. We are not sure this is the intended sentiment - why should Governments bother using those instruments if this is the evidence we have? Are there enabling environments that could be useful to ensure mitigation does occur? Sustained, credible carbon prices are also needed. If these paragraphs remain as is, they would also be inconsistent with the discussion in the subsection on page 20. (Government of United Kingdom)	Noted. Text amended and restructured. Space constraints prevent detailed elaboration.
SPM-1614	E-SPM-910	A	15	20			" A wide variety of national policies and intruments RD&D and information": Are these policies and instruments mentioned in the order of importance? (Ben Muirheid, International Fertilizer Trade Association (IFA))	No.
SPM-1615	G-SPM-50	B	15	20			It would be useful to add a summary of the key options – perhaps from a cut down version of Table 4.2 in the main SYR report. (Government of United Kingdom)	Rejected. Space constraints. See longer report.
SPM-1616	E-SPM-911	A	15	21	15	21	I propose to say "... including carbon pricing, regulation, taxes..." instead of "including carbon pricing, regulation..." (Félix Hernández, IEG-CSIC)	Noted. List amended to be consistent with WG3 SPM
SPM-1617	E-SPM-913	A	15	22	15	22	spell-out RD&D (Suam Kim, Pukyong National University)	Accepted. Will be explained the 1 st time.
SPM-1618	E-SPM-917	A	15	22	15	22	Is RD&D different than R&D? (Peter Berry, Health Canada)	Yes. Accepted. Will be explained the 1 st time.
SPM-1619	E-SPM-912	A	15	22			What is RD&D? (Gabriele Hegerl, Duke University)	Accepted. Will be explained the 1 st time.
SPM-1620	E-SPM-914	A	15	22			RD&D. Why not simply R&D? (Michel Rixen, NATO Undersea Research Center)	Rejected. 2 nd D important (see glossary).

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SPM-1621	E-SPM-915	A	15	22			RD&D ?? (Monica Beatriz Wehbe, National University Rio Cuarto)	Accepted. Will be explained the 1 st time.
SPM-1622	E-SPM-916	A	15	22			Perhaps a footnote explaining what RD&D is? (Rolf Mueller, Research Centre Juelich)	Accepted. Will be explained the 1 st time.
SPM-1623	E-SPM-918	A	15	22			Add footnote: what is RD&D (Andreas Matzarakis, Meteorological Institute, University of Freiburg)	Accepted. Will be explained the 1 st time.
SPM-1624	E-SPM-919	A	15	24	15	28	Strongly support this paragraph. (Nick Campbell, ARKEMA SA)	Thanks. Para kept.
SPM-1625	E-SPM-920	A	15	24	15	28	paragraph not clear, the same for section 4.3 (Monica Beatriz Wehbe, National University Rio Cuarto)	Rejected. Is approved SPM text and supported by other reviewers.
SPM-1626	E-SPM-921	A	15	24			I believe this reference is only to energy supply infrastructure, as is the estimated \$20 trillion investment requirement. More specifically, much of the potentially for carbon avoidance identified in bottom-up studies is related to investments in energy using buildings and equipment. The incremental cost of these energy saving investments is more difficult to quantify and presumably is not included in the estimate. On the other hand, if the estimate does include investments to both increase supply and reduce consumption, this should be clarified. (Alan Miller, International Finance Corporation - CESEF)	Rejected. Suggestion too detailed.
SPM-1627	G-SPM-616	A	15	26	15	26	This sentence would read better as "energy infrastructure and other capital stock" or "energy and other infrastructure capital stock". (Government of Canada)	Rejected. Approved SPM text.
SPM-1628	E-SPM-922	A	15	26	15	28	This sentence is very weak with rather obvious content. The next sentence in the WG3 SPM would give more information, e.g. consider as a replacement: "Initial estimates show that returning global energy-related CO2 emissions to 2005 levels by 2030 would require net additional investment from negligible to 5-10% of the total." This would neatly link in with the first statement of the paragraph. (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	Sentence replaced with new statement referring to required shift in investment patterns.
SPM-1629	E-SPM-923	A	15	26	15	28	Please remove "may take many decades". The sentence should be read as follows: "Even if early investments in low-carbon technologies are made attractive, the widespread diffusion of these technologies depends on a wider range of factors, such as a favorable policy and regulatory framework and RD&D." Reason: it is not accurate to mention that the widespread diffusion of low carbon technologies may take many decades. It depends on several and different policy and market factors. (Christian Kjaer, European Wind Energy Association (EWEA))	Sentence replaced with new statement referring to required shift in investment patterns.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1630	G-SPM-618	A	15	30	15	30	suggest deleting "There is high agreement and much evidence that" (Government of Republic of Korea)	Text amended. Not longer relevant.
SPM-1631	E-SPM-924	A	15	30	15	32	This statement, while not incorrect, may leave an excessively optimistic impression, implying that the mitigation options have mostly positive benefits, with few costs or trade-offs. I suggest the authors may want to look at the statement again to ensure that readers do not get the misperception that mitigation will be entirely easy and painless. For example, they may want to say "some mitigation options" in place of "many mitigation options" and "offset a fraction of mitigation costs" in place of "offset a substantial fraction of mitigation costs". (The terms "many" and "substantial" are ill-defined and subject to misinterpretation.) (Henry Janzen, Agriculture and Agri-Food Canada)	Rejected. Sentence does not exclude trade-offs.
SPM-1632	E-SPM-925	A	15	30	15	32	There are other additional and important co-benefits that should be mentioned. The sentence should be read as follows: "(...) mitigation options can provide additional co-benefits, such as reduced air pollution, balance of trade improvement, provision of modern energy services to rural areas and employment." WGIII SDM page 18. (Christian Kjaer, European Wind Energy Association (EWEA))	Accepted. Wording changed.
SPM-1633	E-SPM-927	A	15	30	15	32	Sentence is difficult to read, as it is not clear (due to "such as ..which ...and ...") what each clause is qualifying. It could be split in two. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Noted, Sentence rephrased.
SPM-1634	G-SPM-617	A	15	30	15	32	These paragraph should be written as follow: "There is high agreement and much evidence that many mitigation options that ARE CONSISTENT WITH SUSTAINABLE DEVELOPMENT can provide co-benefits such as reduced air pollution, which benefits on human health, agriculture and can offset a substantial fraction of mitigation costs." (Government of Cuba)	Text amended. Not longer relevant.
SPM-1635	E-SPM-926	A	15	30	15	40	The introduction of the italicised terms (high agreement and much evidence, medium evidence, and high confidence) is confusing, especially as they are not defined. How does this compare with likely, very likely, etc? As mentioned above, a consistent approach to confidence should be used throughout the synthesis report. (Roger Street, UKCIP-OUCE)	Rejected. Defined in introduction.
SPM-1636	E-SPM-928	A	15	31	15	31	such as reduced air AND WATER pollution (Germán Poveda, Universidad Nacional de Colombia)	Reject. Not supported.
SPM-1637	G-SPM-619	A	15	32	15	32	At the end of this sentence, add a new paragraph: "Investing in energy efficiency is often more cost-effective than investing in new energy supplies. Renewable energy, nuclear power, and carbon capture and storage are technology options that could make important contributions to mitigation from energy supply by 2030." (Government of United States)	Text amended. Not longer relevant.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1638	E-SPM-929	A	15	33	15	44	Biodiversity losses and ocean acidification do not seem to respond to adaptive measures, so that one can not say with confidence that these types of measures will be sufficient. Mitigative measures may be the only measure that will effectively limit biodiversity losses and ocean acidification. (Magdalena Muir, Environmental and Legal Services Ltd.)	Not clear how this comment relates to the text in question.
SPM-1639	E-SPM-930	A	15	34	15	34	This is critical. Why is there only medium evidence? Many public health authorities advocate to the public to reduce GHGs as a preventative health measure. This will be an important finding for them that they will want to understand - should they stop trying to get people to change their behaviours? (Peter Berry, Health Canada)	Sentence deleted for space reasons
SPM-1640	G-SPM-622	A	15	34	15	34	suggest writing "With medium evidence, changes" instead of "There is also high agreement, but only medium evidence that changes" (Government of Republic of Korea)	Sentence deleted for space reasons
SPM-1641	G-SPM-623	A	15	34	15	34	Change "but only" to "and medium evidence" to be consistent with the other confidence statements in this section and with WGIII SPM. (Government of Canada)	Sentence deleted for space reasons
SPM-1642	E-SPM-931	A	15	34	15	35	There is also much evidence that changes in life style and behaviour patterns can greatly increase emissions. (Elizabeth L Malone, Pacific Northwest National Laboratory)	Sentence deleted for space reasons
SPM-1643	E-SPM-933	A	15	34	15	35	Suggest that you add management practices to this statement, to more closely reflect WGIII SPM, para 7: "... that changes in life-style [and], behaviour patterns AND MANAGEMENT PRACTICES can contribute ..." (Harald Winkler, Energy Research Centre, University of Cape Town)	Sentence deleted for space reasons
SPM-1644	E-SPM-934	A	15	34	15	35	Do we know of any society that has consciously tried to change its lifestyle to mitigate climate change? (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Sentence deleted for space reasons
SPM-1645	E-SPM-935	A	15	34	15	35	Change life style and behaviour patterns by PRODUCTION AND CONSUMPTION PATTERNS (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Sentence deleted for space reasons
SPM-1646	E-SPM-936	A	15	34	15	35	Another sentence that is a bit problematic. There seems little doubt that changes in life style can (in principle) mitigate climate change - the issue is whether such changes in life style will actually be adopted. Is the sentence trying to convey that there is high agreement that changes in life style can mitigate climate change, but only medium evidence that the required changes in life style are likely to be adopted? (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Sentence deleted for space reasons

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1647	G-SPM-620	A	15	34	15	35	This statement sounds like a subjective assessment among experts (high agreement) that begs for objective indicators, which do not yet exist (medium evidence). Some quantitative context for high agreement/medium evidence would be helpful. (Government of United States)	Sentence deleted for space reasons
SPM-1648	E-SPM-932	A	15	34			The conclusion that there is only medium evidence to support the impact of changes in life style and behaviour patterns on GHG emissions is surprising, especially when contrasted with the conclusion on the following page (page 16, line 9) that there is much evidence to support the impact of international cooperation. The final document will presumably include definitions for these terms as well as supporting references to support the summary assessments. (Alan Miller, International Finance Corporation - CESEF)	Sentence deleted for space reasons
SPM-1649	G-SPM-621	A	15	34			The message in this sentence is important, but also rather obvious. We think that a less academic text might convey the same message in an easier way: "Changes in life style and behaviour patterns can contribute to climate change mitigation, but the barriers for this are significant." (Government of Norway)	Sentence deleted for space reasons
SPM-1650	G-SPM-624	A	15	35			Change the phrase "life style and behaviour patterns" by "PRODUCTION AND CONSUMPTION PATTERNS" (Government of Cuba)	Sentence deleted for space reasons
SPM-1651	E-SPM-937	A	15	37	15	37	Change affects by INFLUENCES OVER climate change..... (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Wording revised.
SPM-1652	G-SPM-626	A	15	37	15	38	This statement is too general and does not say much. What exactly is meant with "vice versa"? Better to include the much more to the point statement from WG II that Sustainable development can reduce vulnerability, and climate change could impede nations' abilities to achieve sustainable development. (See SPM Wg II) (Government of Germany)	Wording revised
SPM-1653	G-SPM-627	A	15	37	15	38	This sentence is confusing because of the "vice versa". Consider making two sentences. (Government of United States)	Wording revised.
SPM-1654	G-SPM-628	A	15	37	15	45	There is no mention of incremental cost of adoption of shift to sustainable development or climate change mitigation policies or strategies, particularly for developing countries (Government of India)	Rejected. Not in underlying report, and does not appear relevant in revised structure for this section.
SPM-1655	G-SPM-625	A	15	37			We think that this main message is somewhat diffuse and non-informative and we propose that it is substituted by, for example, the sentence in line 40-41. (Government of Norway)	Wording revised.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1656	G-SPM-629	A	15	38	15	38	The use of the phrase "vice-versa" in this context is not clear. (Government of Australia)	Wording revised.
SPM-1657	G-SPM-630	A	15	38	15	38	"Information" is not a national policy or instrument per se, suggest that "information" is replaced with "the provision of information on climate change". (Government of Australia)	Wrong reference. Information in line 22 (approved SPM text)
SPM-1658	E-SPM-939	A	15	40	15	40	change to "planning and response capacity" - it is too late if you are only responding. (Peter Berry, Health Canada)	Rejected. Proposed term not used in report.
SPM-1659	E-SPM-938	A	15	40	16	2	Excellent -- also refer to "development paths" generally. (Elizabeth L Malone, Pacific Northwest National Laboratory)	Rejected. Development paths in topic 5.
SPM-1660	E-SPM-941	A	15	41	15	42	SYR says "limited studies" provide high agreement that non-climate policies have impacts on GHG emissions. WGIII SPM, para 7 said "There is growing evidence"! The underlying chapter 12 said on macroeconomic and fiscal policy: "This link has been extensively studied in the past decades...". The phrase limited studies is not supported by the WGIII SPM nor chapter. (Harald Winkler, Energy Research Centre, University of Cape Town)	Accepted. Text changed.
SPM-1661	E-SPM-942	A	15	41	15	42	Is it accurate to call it "limited studies" which implies few or insufficient number or quality of studies? (Jacob Park, Green Mountain College)	Accepted. Text changed.
SPM-1662	E-SPM-940	A	15	41	15	44	The sentence should be rephrased as follows: "(...) decisions about fiscal policies, multilateral development bank lending, insurance practices, industrial policies, electricity market liberalisation, energy security, renewable energy policy framework, forest conservation, for example, can have profound impacts on greenhouse gas emissions". (Christian Kjaer, European Wind Energy Association (EWEA))	Specific examples removed for space reasons.
SPM-1663	G-SPM-631	A	15	41	15	45	How can one have "high agreement" with "limited studies"? Two studies that agree would not evoke "high agreement" within the WG1 community. Suggest dropping "provide high agreement that" and inserting "suggest." (Government of United States)	Noted, Text changed. Change "reduce" to "affect" in line 13 in longer report page 9 and SPM page 3
SPM-1664	E-SPM-943	A	15	42	15	45	I find it a bit unsatisfactory that a long list of influences is given on greenhouse gas emissions, without any sense of whether they act to increase or decrease emissions. I recognise that this information is obviously in the report, but this list does, for example, make me wonder whether electricity market liberalisation increases or decreases emissions. (Nathan Gillett, University of East Anglia)	Noted, specific examples removed.
SPM-1665	E-SPM-944	A	15	43	15	43	I do not understand why electricity market liberalisation can have profound impacts on greenhouse gas emissions. This is not the case in LatinAmerica. (Germán Poveda, Universidad Nacional de Colombia)	Specific examples removed

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1666	E-SPM-946	A	15	43	15	43	Electricity market liberalisation. I think it is necessary to delete "liberalisation" because introduce a political guide and the sentence continue correctly. (Dionisio Rodriguez Alvarez, Xunta de Galicia)	Specific examples removed
SPM-1667	E-SPM-947	A	15	43	15	43	Change electricity market liberalisation by ELECTRICITY USE POLICIES (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Specific examples removed
SPM-1668	E-SPM-948	A	15	43	15	44	Add: "...energy security AND MORE RENEWABLE ENERGY USE, forest conservation,..." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Specific examples removed
SPM-1669	E-SPM-949	A	15	43	15	44	— Recommendation: Energy security should get much more emphasis in the SPM. — Explanation. • Energy is the fuel of the economy. The past has shown wars are possible to secure the energy supply of some countries. • Nuclear power is the least secure of all energy supply systems, for several reasons. The thermodynamically suitable uranium supplies will run out within the lifetime of new nuclear build. The chances of discovering new uranium resources of the same quality as the currently known resources are slim. • The recycling of plutonium introduces uncontrollable large security risks, posed by terroristic abuse of plutonium. MOX fuel can easily be separated into uranium and plutonium. • Energy security can only be guaranteed by using renewable energy sources: wind, and sun via different pathways (PV, CSP, biomass). These sources are free for everyone on earth, are constant of quantity and of thermodynamicquality. The potential of solar energy is technically sufficient for the world energy supply, with a large margin to grow. (Jan Willem Storm van Leeuwen, Ceedata Consultancy)	Specific examples removed
SPM-1670	E-SPM-945	A	15	43			electricity market liberalisation'. May imply reduction of pricing and increased use... (Michel Rixen, NATO Undersea Research Center)	Specific examples removed
SPM-1671	G-SPM-632	A	15	43			Change the phrase "electricity market liberalisation" by "ELECTRICITY USE POLICIES" (Government of Cuba)	Specific examples removed
SPM-1672	E-SPM-951	A	15	44	15	44	..conservation, and producing new crop varieties with more resistance power for high temperature, for example.. (Masatoshi Yoshino, Retired)	Specific examples removed
SPM-1673	E-SPM-950	A	15	44			Replace "Security" with "availability and affordability". (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Specific examples removed
SPM-1674	E-SPM-952	A	15	45			Might mention that WTO and WB market signals must be aligned to drive the clean energy transition and sustainable development (as addressed in Our Common Future two decades ago). I think laying out criteria for energy choices would help distinguish those that are 'no-regrets' and doable now, from those that need further study before being brought up to scale. These include: choosing technologies and practices that optimize adaptation and mitigation, maximize co-benefits and minimize unintended consequences throughout their life cycle. (Paul Epstein, Harvard Medical School)	Rejected. SPM terminology. Too detailed.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1675	E-SPM-953	A	15				The figure shows numbers at the top, but no definition - add "US\$/tCO ₂ -eq" to both sets. It should be in colour. It is worth mentioning in the caption that the bottom-up studies include "no-regrets" options. It would also be good to show these potentials in relation to expected increases in GHG emissions to 2030 also given in WG3 SPM. I shall attach a Figure which makes the point. [TSU note: This Figure is available in the Appendix] (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	Noted. Figure replaced by table.
SPM-1676	E-SPM-954	A	15				In the legend for Fig. SPM-7 indicate the meaning for the different dollar values. (Robert Jefferies, University of Toronto)	Noted. Figure replaced by table.
SPM-1677	E-SPM-955	A	15				I have problems from page 15 on - much of these statements would seem obvious to policymakers. Some are just motherhood - "there are options for achieving reductions at international level... through cooperation". Please don't tell me this is necessary to include (Tom Crowley, Duke University)	Noted.
SPM-1678	E-SPM-956	A	15				Figure SPM-7: No caption to the Figure. Proposal: Figure SPM-7. Global economic potential in 2030 estimated from bottom-up and top-down studies according carbon prices. (Annick Douguédroit, Université de Provence)	Noted. Figure replaced by table.
SPM-1679	E-SPM-957	A	15				Figure SPM-7: what are bottom-up and top-down? (Peter Haas, University of Massachusetts)	See glossary.
SPM-1680	E-SPM-958	A	15				Figure SPM-7: This figure should be omitted as it does not add information relevant to policymakers. (John R. Porter, University of Copenhagen)	Noted. Figure replaced by table.
SPM-1681	E-SPM-959	A	15				Figure SPM-7: It needs to make clear that the values in the legend refer to a "per tonne" basis (see also the figure in the actual Topic) (Keith Shine, University of Reading)	Noted. Figure replaced by table.
SPM-1682	E-SPM-960	A	15				Figure SPM-7: it is impossible to understand this figure with such a short description and discussion. (Marco Mazzotti, ETH Zurich)	Noted. Figure replaced by table.
SPM-1683	E-SPM-961	A	15				Figure SPM-7: In the caption there is "global economic potential" while in the figure it is "mitigation potential", make these consistent if possible. (Mark Lawrence, Max Planck Institute for Chemistry)	Noted. Figure replaced by table.
SPM-1684	E-SPM-962	A	15				Figure SPM-7: I don't understand <20\$, <50\$ and <100\$. Should they be replaced by 1-20\$, 21-50\$ and 51-100\$? (Annick Douguédroit, Université de Provence)	Rejected. Cumulative.
SPM-1685	E-SPM-963	A	15				Figure SPM-7: can't these 2 tables be combined somehow? (Peter Haas, University of Massachusetts)	Noted. 2 nd Figure replaced by table.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1686	E-SPM-964	A	15				Figure SPM-7: Before « 2000 were... add: Low end of range is the low end of range of the Economic potential and High end of range the high end of range of the reduction relative to SRES B2. (Annick Douguédroit, Université de Provence)	Noted. Figure replaced by table.
SPM-1687	E-SPM-965	A	15				Figure SPM-7: ..and 68 Gt ...(SRES A1B). It seems that SRES A1B is not used in the figure. See WGIII, pages 2 and 3. (Annick Douguédroit, Université de Provence)	Noted. Figure replaced by table.
SPM-1688	E-SPM-966	A	15				Figure SPM-7. Could this figure be in color?. The same applies to the same figure in Topic 4. (Alvaro Osornio Vargas, Universidad Nacional Autónoma de México)	Noted. Figure replaced by table.
SPM-1689	E-SPM-967	A	15				Figure SPM-7. Is this needed in addition to SPM-6? (Joanna Haigh, Imperial College)	Noted. Figure replaced by table.
SPM-1690	E-SPM-968	A	15				Figure SPM-7 is not clear. What is 'low end of range' etc How does this potential translate in percentage of emissions? (Michel Rixen, NATO Undersea Research Center)	Noted. Figure replaced by table.
SPM-1691	E-SPM-969	A	15				delete Figure SPM-7 (Suam Kim, Pukyong National University)	Noted. Figure replaced by table.
SPM-1692	G-SPM-633	A	15				What is the point of Figure SPM-7? This is not clearly explained in the text or in the caption. These are just cut and pasted from the topic text and not used to really make a summary. (Government of United States)	Accepted. Replaced by table.
SPM-1693	G-SPM-634	A	15				In Figure SPM-7, authors need to clarify what is meant by 'low end of range' and 'high end of range.' Range of what? (Government of United States)	Accepted. Replaced by table.
SPM-1694	G-SPM-635	A	15				Figure SPM-7: This figure needs some clarification. Do the different histograms represent a different price of carbon? If so this needs to be stated explicitly. (Government of Australia)	Accepted. Replaced by table.
SPM-1695	G-SPM-636	A	15				Figure SPM-7: The negative cost abatement options should be constrained by a range (also applies to Figure 4.1) (Government of Australia)	Accepted. Replaced by table.
SPM-1696	G-SPM-637	A	15				Figure SPM-7: The authors need to explain in a footnote the difference between top-down and bottom-up studies. (Government of Australia)	See glossary

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1697	G-SPM-638	A	15				figure SPM-7 does not convey the full information in figure SPM-5 of page 9 in the SPM of WGIII. In particular, it does not reflect the differences in the mean potential ranges between bottom-up and top-down studies. (Government of Kingdom of Saudi Arabia)	Accepted. Replaced by table.
SPM-1698	G-SPM-639	A	15				Fig. SPM-7: what mean numbers at the top of the figure (especially, < \$0 at the left side)? (Government of Russian Federation)	Accepted. Replaced by table.
SPM-1699	G-SPM-640	A	15				Can't these two tables be combined somehow? (Government of United States)	Accepted, replaced by single table
SPM-1700	E-SPM-970	A	16	0			The phrase "sustainable development" seems to be shorthand with specific meaning to the United Nations. It is not always clear to those who did not participate in the process. I suspect that "sustainable development" means more than preserving topsoil, oil reserves, and other resources. Does it also mean equity between developed and emerging economies? Does "development" necessarily imply increases in GDP, or do other sorts of improvement in human condition count as development? Please try to be as specific as possible instead of using jargon. (Daniel Murphy, NOAA Earth System Research Laboratory)	See glossary.
SPM-1701	E-SPM-971	A	16	1	16	1	Insert "more" before "sustainable world". (So reads: "...important levers for creating a more sustainable world." (Pat Finnegan, Grian)	Text removed for space reasons.
SPM-1702	G-SPM-641	A	16	1	16	1	The phrase "may turn out to be" is not helpful for policy readers. The authors need to provide a more categorical assessment. (Government of Australia)	Text removed for space reasons.
SPM-1703	E-SPM-972	A	16	1	16	2	Define what is meant by a sustainable world (e.g., what does this mean in terms of adaptation and mitigation?) (Roger Street, UKCIP-OUCE)	Text removed for space reasons.
SPM-1704	E-SPM-973	A	16	1	16	2	"...for creating a sustainable world" - change "world" to "environment", since the world already exists and we cannot recreate it, but the environment is easy to modify (Mark Lawrence, Max Planck Institute for Chemistry)	Text removed for space reasons.
SPM-1705	G-SPM-642	A	16	4	16	4	Consider changing "synergies" to "synergistic climate and development benefits" for clarity. (Government of United States)	Rejected. This is specifically about AM synergies only
SPM-1706	E-SPM-975	A	16	4	16	7	This is so vague...trade-offs are possible... What does that mean? That they'll be needed? That they might happen? That we're not sure if these objectives are opposed or not? Please clarify. (Noel Gurwick, Carnegie Institution)	Wording revised.

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SPM-1707	E-SPM-977	A	16	4	16	7	I was pleased to see this point being made. Obviously in the future when selecting either adaptation options or mitigation options, measures that achieve both are likely to be more desirable. (Ian Church, Yukon Government)	Thanks
SPM-1708	E-SPM-978	A	16	4	16	7	I don't think the word "trade-offs" is appropriate here, although can not think of alternative. Replace "are possible" (which sounds like it's a good thing) with "may be necessary". (Donald Lemmen, Natural Resources Canada)	Wording revised.
SPM-1709	G-SPM-51	B	16	4	16	7	This paragraph should mention wider biodiversity, not just forests that have adaptation and mitigation synergies. Recent Royal Society conference (although after the WG2 SPM published) tried to highlight this. Also need to highlight peatlands - huge mitigation role and water management functions as well (and probably livelihoods in Asia) (Government of United Kingdom)	Rejected. Not in underlying report and too detailed.
SPM-1710	E-SPM-974	A	16	4	16	11	This message being conveyed by this paragraph is not clear and it is suggested that the text be revised to indicate that trade-offs may be necessary (rather than are possible) where adaptation requires additional energy use. (Sharon Smith, Geological Survey of Canada)	Wording revised.
SPM-1711	E-SPM-976	A	16	4	16	11	This comment about synergies or interaction between adaptaion and mitigation is an important point to make but it isn't made all that clearly here or in 4.4. Perhaps there should be a clear statement that says that some measures employed to adapt to climate change may also contribute to the mitigation of climate change through modifications to carbon emissions/balance, reductions in feedbacks to the climate system etc or alternatively result in enhancement of emissions and climate warming. Perhaps a statement should also be made that adaptation strategies need to be carefully chosen to ensure that they do no result in enhancement of climate change (or also cause other environmental impacts) through modifications in carbon emissions, feedbacks to climate system etc. (i.e. shouldn't we make choices to avoid trade-offs mentioned?) OR at the very least we should also consider the consequences of our choice of adaptation strategies. (Sharon Smith, Geological Survey of Canada)	Noted. Wording revised, but space limitations. Additional detail in longer report.
SPM-1712	E-SPM-980	A	16	5	16	7	Trade-offs are framed very narrowly here, only "where adaptation required additional energy resources". This is indeed the example cited in WG III SPM, but WGIII chapter 12 has a richer discussion of trade-offs: also in relation to co-benefits, the production frontier and trade-offs between mitigation and local SD. The phrase "are possible" does not convey a sense of trade-off, perhaps 'may be needed'. (Harald Winkler, Energy Research Centre, University of Cape Town)	Wording revised. No space for more extensive discussion.
SPM-1713	E-SPM-979	A	16	5			"trade-offs are possible where adaptation" could be replaced by "mitigation is needed to offset adaptation that" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Reject. Wording clear and from SPM.

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SPM-1714	E-SPM-981	A	16	9	16	11	This section would benefit from including the second sentence of the WGIII SPM summary (para 26): "It also suggests that successful agreements are environmentally effective, cost-effective, incorporate distributional considerations and equity, and are institutionally feasible". Without this sentence, it is difficult to understand what the "greater cooperative efforts" might achieve. Do they achieve either lower costs, "OR" improve environmental effectiveness? Can they not achieve both? (Harald Winkler, Energy Research Centre, University of Cape Town)	Agree, but left out for reasons of space.
SPM-1715	G-SPM-644	A	16	9	16	11	This sentence is vague. Replace it by the following adapted from the paragraph in 4.5, page 10, lines 12-14 "The literature suggests (high agreement, much evidence) that successful international agreements are environmentally effective, cost-effective, incorporate distributional considerations and equity, and are institutionally feasible". (Government of France)	Rejected. Space constraints.
SPM-1716	E-SPM-982	A	16	9	16	20	I am missing here the critical role of CO2-eq price. Only if emissions are limited through international cooperation will CO2-eq emissions become a high enough price so that substantial reductions in emissions become possible (WGIII, e.g. SPM). (Andreas Fischlin, Integrative Biology - Systems Ecology)	Accept. Carbon pricing included more explicitly.
SPM-1717	E-SPM-983	A	16	9	16	20	Do we need a reference of some sort to the importance of the private sector and/or policy/market synergy in terms of achieving this rather elusive international cooperation? (Jacob Park, Green Mountain College)	Rejected because not in WG summaries and space constraints.
SPM-1718	G-SPM-643	A	16	9	16	20	This text is very general and could either be deleted or a one liner could be included making the general point that new institutional mechanisms and cooperation will enhance efforts. However the more important point is missing that cooperation and action won't happen unless the behavioural and institutional barriers are overcome. (Government of New Zealand)	Text revised
SPM-1719	G-SPM-645	A	16	9	16	20	It could be underlined that trading mechanisms across countries reduce overall mitigation costs. (Government of European Community)	Included reference to market mechanisms
SPM-1720	G-SPM-52	B	16	9	16	20	Suggest this sub-section comes before sub-section on sustainable development sub-section on Page 15 line 37-Page 16 line 7 for clarity. (Government of United Kingdom)	Accepted. Good idea and helps with flow.
SPM-1721	E-SPM-986	A	16	13	16	13	Insert: "have already" before "stimulated" and "emergent" before "global carbon market" and make this last plural. (So reads: "The UNFCCC and its Kyoto Protocol have already stimulated an array of policies, created emergent global carbon markets and established....." etc etc) (Pat Finnegan, Grian)	Rejected, using approved WGIII SPM wording.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1722	G-SPM-646	A	16	13	16	13	UNFCCC needs to be defined and its relation to the Kyoto Protocol should be stated. Consider adding footnote. (Government of United States)	See Glossary.
SPM-1723	G-SPM-649	A	16	13	16	13	Strike the phrase "a global" and insert in its place "an international" (consistent with WG3 SPM). (Government of United States)	Accepted.
SPM-1724	E-SPM-985	A	16	13	16	14	Rephrase - the KP did not "create" a global carbon market. Suggest "... stimulated an array of policies that in turn stimulated creation of global carbon markets and established ..." (Donald Lemmen, Natural Resources Canada)	Accepted. Should be international market.
SPM-1725	G-SPM-648	A	16	13	16	14	The concept of "global carbon market" is unclear, please replace the sentence with "international carbon market" (See page 32, line 16 of WGIII SPM). (Government of China)	Accepted.
SPM-1726	G-SPM-650	A	16	13	16	14	Instead of current text it may be worthwhile noting that the UNFCCC and Kyoto Protocol were instrumental in providing the institutional framework that allowed governments and private sector entities to create carbon markets. As currently worded the text reads as if it was the UNFCCC and Protocol that created the markets. Suggested text: an array of policies which in turn led to the creation of an international carbon market..." We suggest changing "global" to "international carbon market" to be consistent with the WGIII SPM. (Government of Canada)	Rejected, using approved WGIII SPM wording
SPM-1727	G-SPM-651	A	16	13	16	14	"The UNFCCC and its Kyoto Protocol stimulated an array of policies, created a global carbon market and established new institutional mechanisms for adaptation and mitigation actions." – It is not a policy-neutral statement, and cannot be considered as a scientific finding. (Government of Russian Federation)	Rejected. Approved text. Don't see what is not policy-neutral.
SPM-1728	E-SPM-984	A	16	13	16	15	This statement is not correct. The Kyoto Protocol did not "create a global carbon market." The Kyoto Protocol, in its Article 17, laid out emissions trading among Parties in Annex B. Article 12 set out the clean development mechanism (CDM). Article 6 set out the provisions that would govern a joint implementation project between Annex I Parties. While rules have been laid out separately for these three mechanisms, and that an international transaction log is indeed taking shape, there is no single global carbon market as the statement says. CDM projects and JI projects have different governance structures. Emissions trading in the EU is governed by the rules and directives of the Commission and laws of the Member States. Countries such as Japan and Canada which are in Annex I and Annex B have yet to establish any national emissions trading system, and certainly there is yet to be any linkage. There is talk of linking emerging systems with the EU ETS, but that is not yet mature. I recommend revising the statement like so: "The UNFCCC and its Kyoto Protocol stimulated an array of	Accepted. Should be international market.

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							policies, stimulated the emergence and operation of carbon markets, and helped to spur new institutional mechanisms for adaptation and mitigation actions." (Arthur Lee, Chevron Corporation)	
SPM-1729	G-SPM-647	A	16	13	16	15	The sentence have lost an important message from WG III about there basis for future mitigation efforts (WG III SPM page 32) and from Topic 4.5 about the KPs modest emissions limits. We suggest the following rewrite:" The UNFCCC and its Kyoto Protocol stimulated and array of policies, created a global carbon market and established new institutional mechanisms that may provide the foundation for future mitigation and adaptation efforts. Although the Kyoto Protocol is currently constrained by its modest emission limits it would be more effective if the first commitment period is followed up by measures to achieve deeper reductions and the implementation of policy instruments covering a higher share of global emissions." (Government of Norway)	Space limitations prevent adding this detail; reference to greater future efforts implies limitations of current efforts.
SPM-1730	G-SPM-652	A	16	14	16	14	After "new institutional mechanisms" insert "that may provide for" as in the WG3 SPM. (Government of United States)	Accepted with the approved SPM word "foundation"
SPM-1731	E-SPM-987	A	16	14			The passage "new institutional mechanisms for adaptation and mitigation actions" looks rather generic. Need to specify which "institutional mechanisms" are meant. (Volodymyr Demkine, UNEP)	Rejected. Not in underlying WG summaries.
SPM-1732	E-SPM-988	A	16	14			Change "adaptation and mitigation actions" to "adaptive and mitigatory actions" - or delete "actions" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text changed.
SPM-1733	G-SPM-653	A	16	15	16	15	Insert sentence before "(4.5)": "Financial flows to developing countries through Clean Development Mechanism projects have the potential to reach levels of the order of several billion US\$ per year" (Government of Germany)	Reject. Too detailed.
SPM-1734	G-SPM-654	A	16	15	16	15	Add the sentence from the WG3 SPM which states, "The impact of the Protocol's first commitment period relative to global emissions is expected to be limited" to provide the reader with context. (Government of United States)	Rejected. Is in longer report. Space constraints.
SPM-1735	E-SPM-990	A	16	17	16	17	Need to be specific - reduce global costs of adaptation and mitigation or just mitigation? (Peter Berry, Health Canada)	Wording revised to make point clear.
SPM-1736	G-SPM-655	A	16	17	16	17	Suggest the following text: "Greater cooperation among nations will reduce global costs and improve the environmental effectiveness of greenhouse gas emission reduction efforts." (Government of Canada)	Taken into account. New text reflects this.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1737	G-SPM-656	A	16	17	16	17	Introduce the words "... reduce substantially global costs ..." (Government of Switzerland)	Rejected: not in SPM. Quantification not appropriate without independent measure.
SPM-1738	G-SPM-657	A	16	17	16	17	Insert after "will" the words "help to" (Government of United States)	Accept.
SPM-1739	E-SPM-989	A	16	17	16	20	This paragraph is weak waffle saying nothing - delete it. (John R. Porter, University of Copenhagen)	Reject. Important policy message.
SPM-1740	E-SPM-991	A	16	17	16	20	It should be as followings, Greater cooperative efforts will reduce global costs or improve environmental effectiveness. These can include diverse elements such as emissions targets; sectoral, local, sub-national and regional actions; RD&D programmes; adopting common policies; implementing development oriented actions; or expanding financing instruments. Some examples for UNFCCC and its KP was Technology Transfer and Clean Development Mechanism. (Bangzhong Wang, China Meterological Administration)	Accepted
SPM-1741	E-SPM-6	B	16	17	16	20	Education and other societal development options should be emphasized. (Shunsuke Mori, Tokyo University of Science)	not possible within space constraints
SPM-1742	G-SPM-53	B	16	17			Replace "or" with "and" - the two objectives are not mutually exclusive! (Government of United Kingdom)	"Or" does not imply exclusivity; "and" not appropriate since actions could strongly favour one or the other outcome, but not necessarily both.
SPM-1743	E-SPM-993	A	16	18	16	18	It would be helpful for policy makers to enumerate here: "binding or non-binding, fixed or dynamic, with or without price caps, country-wide or sectoral emission targets". If this is felt too long or too detailed, please at least specify here "emissions targets of various kinds", allowing policy makers to suspect that Kyoto-style fixed and binding targets may not be the only options. They will (hopefully) find the appropriate details in section 4.5. (Cédric Philibert, International Energy Agency)	Rejected. Follow SPM text
SPM-1744	E-SPM-994	A	16	18	16	18	"...such as emission targets;..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Point is?
SPM-1745	E-SPM-992	A	16	18	16	20	The sentence should be read as follows: " These can include diverse elements such as emission targets; (...); implementing development oriented actions; promoting renewable energy policy instruments and targets; (...)." (Christian Kjaer, European Wind Energy Association (EWEA))	Rejected: renewables not in approved WGIII SPM text and appear too specific (no other energy technologies are mentioned).
SPM-1746	G-SPM-54	B	16	18	16	20	Also add emissions trading, CDM, to elements for cooperative efforts, and explain what is meant by "expanding financial instruments".	Revised text includes market mechanisms; "financing

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							(Government of United Kingdom)	instruments” is wording used in WGIII SPM.
SPM-1747	E-SPM-995	A	16	19	16	19	Please explain the acronym RD&D (Ulf Molau, Göteborg University)	Defined earlier.
SPM-1748	E-SPM-997	A	16	19	16	19	Could RD&D be defined the first time it is used, or replaced with a more accessible synonym? I couldn't work out what this is. (Nathan Gillett, University of East Anglia)	Yes.
SPM-1749	G-SPM-658	A	16	19	16	19	add, in the sentence: implementing "sustainable" development (Government of Canada)	Rejected: approved SPM text
SPM-1750	G-SPM-659	A	16	19	16	19	add "technology transfer;" (Government of India)	Rejected: approved SPM text
SPM-1751	E-SPM-996	A	16	19	16	20	It is risky to claim that "implementing development oriented actions" would contribute to GHG mitigation. In most cases development-oriented actions might elevate emissions as it generally leads to increased growth and use of fossil fuels. It would be more reasonable to claim that implementation of development-oriented actions with climate-co benefits could be a useful component of a broader portfolio of policies. (Kenneth Möllersten, Swedish Energy Agency)	Approved SPM text.
SPM-1752	E-SPM-998	A	16	21			This section should do more to make absolutely clear to policy makers, the post TAR modeling of pathways, scenarios and impacts..... a) current emissions trends and trajectories are more consistent with Group IV-V pathways which imply up to 4.9C temperature rise: b) the much publicized 60% reduction, if achieved would commit to a pathway of up to 2.8C temperature rise: c) if the 2C temperature rise is taken as a threshold for 'dangerous' climate change (as envisaged by the EU), then as defined by the uncertainty curves there are implications for very stringent emissions targets. This conclusion may be politically controversial but should be identified here and particularly up front, in a 'key messages' section at the beginning of the SPM. (Joe Ravetz, University of Manchester)	Inappropriate to focus on a specific political target; section makes clear that the lower the target, the greater efforts have to be.
SPM-1753	E-SPM-999	A	16	23	16	26	This might be OK if it weren't a summary for policy-makers. It is so wordy and confusing. (Noel Gurwick, Carnegie Institution)	Taken into account; headline shortened
SPM-1754	E-SPM-1000	A	16	23	16	26	Not clear as to the meaning of this topic heading. Is this describing a desired long-term perspective? (Roger Street, UKCIP-OUCE)	Taken into account; headline shortened
SPM-1755	G-SPM-660	A	16	23	16	26	We suggest that "Climate convention" is used instead of "Convention". (Government of Norway)	Headline shortened; no longer relevant

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1756	G-SPM-661	A	16	23	16	26	This is too long for a 'title'. We suggest just "The long-term perspective" and that the detail of the scope and structure of the topic be removed from the title and set out briefly in the following text. (Government of New Zealand)	Taken into account; headline shortened
SPM-1757	G-SPM-662	A	16	23	16	26	This heading is too long and wordy (as is this whole section). Can something pithier be used? At minimum, how about deleting "the objectives and provisions of"? (Government of United States)	Taken into account; headline shortened
SPM-1758	G-SPM-663	A	16	23	16	31	The style and substance of this section are dissimilar to those of the preceding sections. The language is less direct and harder to understand. (Government of United States)	Taken into account in revision of text
SPM-1759	E-SPM-1001	A	16	25	16	25	Which Convention is not specified. (Daniel Murphy, NOAA Earth System Research Laboratory)	Headline shortened, comment no longer relevant
SPM-1760	G-SPM-664	A	16	25	16	25	Replace "Convention" by "Climate Change Convention". (Government of Republic of Benin)	Headline shortened, comment no longer relevant
SPM-1761	G-SPM-665	A	16	25	16	25	Please be specific on which Convention (Government of Sweden)	Headline shortened, comment no longer relevant
SPM-1762	E-SPM-1002	A	16	26	16	26	I would delete ", and in the context of" The sentence is very awkward. (Katherine Casey Delhotal, RTI International)	Taken into account; headline shortened
SPM-1763	G-SPM-666	A	16	27	16	27	For both the SPM and the SYR full report (Topic 5) suggest providing a definition of "long term", to better delineate this section from the previous one and to avoid confusion (the timeframes 2050 and 2100 are used about equally). WGIII specifies "long term" as 2030 and beyond." Long-term" could perhaps be explained in the new (suggested) introductory text to this section. (Government of Canada)	There is no clear delineation, as "long-term" depends on context; wording is plenary-approved topic heading
SPM-1764	G-SPM-667	A	16	27	16	27	Again, this section needs some introductory text. For this section, it would be useful to have some text that introduces the language of 'vulnerability'. The text in the following paragraphs is awkward to read and may not be properly understood by lay readers. Talking about impacts being associated with key vulnerabilities is a difficult concept because in lay terms, these may be interpreted to be the same thing. Impacts being associated with 'opportunities' is also a rather hard concept to grasp. Also, provide some sense of what's new here since the TAR. Suggest highlighting briefly points such as the "stronger reasons for concern" (from page 17, lines 10 and 11), the enhanced detail available in table SPM 3 (due for example to extra model runs), new evidence on distribution of impacts (SYR, full report, Topic 5, page 3, lines 8 to 11) and the new summary of economic work available in table SPM 4.	Rejected due to space reasons

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							(Government of Canada)	
SPM-1765	G-SPM-669	A	16	28	16	29	The repetition of the words “adaptation” and “mitigation” make this hard to understand. (Government of United States)	Taken into account, wording revised
SPM-1766	E-SPM-1003	A	16	28	16	31	Not sure how helpful this is - implies that coherent decision making should or does occur by single persons/agencies on both adaptation and mitigation measures, when in practice decisions in these two areas are rarely linked and involved very different actors/departments within a country. (Peter Berry, Health Canada)	Taken into account, wording revised
SPM-1767	E-SPM-1004	A	16	28	16	31	Does the inclusion of both adaptation and mitigation in a single "risk management process" suggest that they can be traded off? That there is an optimal, i.e. lowest-risk, level for both ? (Harald Winkler, Energy Research Centre, University of Cape Town)	Taken into account, wording revised
SPM-1768	E-SPM-1005	A	16	28	16	31	Addition of the words "adaptation and" to this statement from WGIII is awkward, and potentially misleading in suggesting that mitigation and adaptation decision-making processes are very similar. Minimally, it is necessary to change the word "damages" to "impacts", as adaptation decision-making also has to consider the opportunities that arise from changing climate (impacts may be either positive or negative, damages are negative). (Donald Lemmen, Natural Resources Canada)	Taken into account, wording revised
SPM-1769	G-SPM-668	A	16	28	16	31	This header fails to bring in the key information from WG1—i.e., that decisionmaking also depends on the details of the unfolding climate change that are not now predictable. The current header is too limited to WG3 issues and therefore incorrect. (Government of United States)	Taken into account; reference to uncertainty of climate sensitivity included
SPM-1770	G-SPM-670	A	16	28	16	31	The original WG III SPM text on which this chapeau sentence is based, in fact referred to decision making only about mitigation: "Decision-making about the appropriate level of global mitigation over time involves ...". Introducing adaptation into the decision areas in this SPM ("Decision-making about the appropriate level of adaptation and global mitigation over time involves ...") makes the following text, where adaptation and mitigation are both mentioned again, seem redundant. We suggest the best solution is to have: "Decision-making about the appropriate response to climate change over time involves an iterative risk management process that includes both mitigation and adaptation, taking into account ...". An alternative would be: "Decision-making about the appropriate level of adaptation and global mitigation over time involves an iterative risk management process that takes into account ..." (Government of New Zealand)	Taken into account, wording revised
SPM-1771	G-SPM-671	A	16	28	16	31	The meaning of this long sentence in bold should be replaced by a text about five key vulnerabilities identified in the following text p 16, line- page 17, line 12. The existing text	Section restructured, believe the (revised) statement makes

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							in bold seems to be difficult to understand and not consistent with the following text. (Government of Norway)	more sense in its new place.
SPM-1772	G-SPM-672	A	16	28	16	31	Delete "that includes mitigation and adaptation," and change the word "damages" to "impacts" - indicating that adaptation decision-making has to also consider the benefits (positive impacts) that result from climate change. Revised text as follows "Decision-making about the appropriate level of adaptation and global mitigation over time involves an iterative risk management process taking into account actual and avoided climate change impacts, co-benefits, sustainability, equity, and attitudes to risk". (Government of Canada)	Taken into account, wording revised
SPM-1773	G-SPM-55	B	16	28	16	31	Chapeau text in lines 28-31 and page 17 lines 1-4 - The chapeau on 16 seems to be focused on impacts and lacks a reference to socio-economic factors but the bullet point in lines 1-4 on page 17 seems to refer to markets - please clarify this relationship (Government of United Kingdom)	Section restructured
SPM-1774	G-SPM-674	A	16	29	16	29	Delete the word "risk", as other management process may be involved (sustainability and equity are mentioned in the following line). (Government of France)	Rejected; these other criteria are also mentioned in the heading
SPM-1775	G-SPM-673	A	16	29	16	30	It is suggested to change "mitigation and adaptation" to "adaptation and mitigation" in order to be consistent with the headline. (Government of China)	accepted
SPM-1776	G-SPM-676	A	16	33	16	33	The authors need to explain what an "important opportunity" refers to. (Government of Australia)	text deleted
SPM-1777	G-SPM-675	A	16	33	16	35	This sentence is not relevant to policymakers and should be omitted. (Government of New Zealand)	accepted
SPM-1778	E-SPM-1006	A	16	33	16	36	This paragraph is weak waffle saying nothing - delete it. (John R. Porter, University of Copenhagen)	accepted
SPM-1779	E-SPM-1007	A	16	33	16	36	This is so abstract as to be meaningless. What is a "key vulnerability" is it one that exceeds a threshold for adaptation? (Peter Berry, Health Canada)	text revised
SPM-1780	G-SPM-677	A	16	33	16	36	It is not clear why the term "important opportunity" is included here. The WG2 SPM (and WG2 Chapter 19) speak of "key vulnerabilities" only. It is also rather vague and could be dropped. (Government of European Community)	text deleted
SPM-1781	G-SPM-678	A	16	36	16	36	Suggest adding to the end of this paragraph the following text, simplified from text in the WGII Technical Summary (page 67): "Some Key Vulnerabilities may be linked to	accepted

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							thresholds that cause a system to shift from one state to another, while other Key Vulnerabilities will have thresholds that are defined subjectively." This conveys an important distinction and the fact that many Key Vulnerabilities have subjective thresholds is the reason why it is not possible to set hard and fast thresholds for when impacts become 'significant' - a discussion that is taken up in the next paragraph in the discussion of Reasons for Concern. (Government of Canada)	
SPM-1782	E-SPM-1009	A	16	38	16	38	I suggest to indicate here the abbreviation for the Third Assessment Report, i.e. TAR. (Marco Mazzotti, ETH Zurich)	already done earlier in revised SPM
SPM-1783	E-SPM-1010	A	16	38	17	8	How can the threat of accelerating sea level rise not be listed here--it is a huge reason for concern. (Michael MacCracken, Climate Institute)	there are many specific impacts, the list focuses on those where new knowledge is relevant; with regard to sea level rise, uncertainties rather than knowledge have grown
SPM-1784	G-SPM-679	A	16	38	17	8	There is too much repetition between this section and page 12 line 32 to page 13 line 7. This is not helpful to the policymaker. This section (p16 l38 - p17 l8) could probably be omitted in full, without loss and with only minor changes to the earlier section. (Government of New Zealand)	Rejected; Reasons For Concern provide an important perspective for evaluating changes in risks with a global perspective, and provide continuity with the TAR
SPM-1785	G-SPM-680	A	16	38	17	8	It is very noticeable that the text here under each Reason for Concern has been changed from the text in the Synthesis Report (and even in the shorter version of the WGII Technical Summary) in a way that eviscerates the messages about Reasons for Concern. Text that identified temperature thresholds (i.e. systemic thresholds) and text which indicated that there was evidence that risks are now thought to be associated with lower global temperature increases, has been deleted. The important conclusions are lost in the current text and therefore the text should be significantly strengthened to better reflect the results as in the underlying Synthesis Report. See specific comments below. (Government of Canada)	Wording revised
SPM-1786	G-SPM-36	C	16	38	17	8	" Indicate at which level of temperature these risks do become important" (Government of Belgium)	Quantitative temperature thresholds cannot always be given, including because "importance" of risk is a normative judgement
SPM-1787	E-SPM-1008	A	16	38	17	12	Would be very useful to indicate that generally these "reasons for concern" apply and are important to both developing and developed countries.	introductory wording revised to make this clearer

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Peter Berry, Health Canada)	
SPM-1788	G-SPM-681	A	16	38	17	12	Important section on reasons for concern, however, this highly relevant information on how the assessment of the reasons for concern has developed since the TAR would be much more useful for policymakers if the relevant graph from the Synthesis Report of the TAR would be updated. Strongly suggest to include an update of figure SPM-2 of the TAR WG II report (and included in SPM 3 of the Synthesis Report of the TAR,, using the "burning-ember" framework to show how the reasons for concern increase with temperature, should be included with high priority, as this figure from TAR is one of the most widely used, and an update of it in the AR4 is therefore necessary. This should include the figure from TAR and updated next to it, for better comparison. (Government of Germany)	Burning embers figure was discussed but not supported by the entire author team.
SPM-1789	G-SPM-682	A	16	39	16	39	Insert "qualitative" before framework (Government of Australia)	Rejected, based on WGII SPM wording
SPM-1790	G-SPM-683	A	16	40	16	42	This sentence is rather vague. Suggest to substitute with the following language from WG 2 Section 19.3.7: "Based on new and stronger evidence of observed ADVERSE impacts of regional climate change on MANY unique and vulnerable systems, there is now high confidence that a warming of up to 2 °C above 1990-2000 levels would have significant impacts on many unique and vulnerable systems." (Government of European Community)	Taken into account in revised wording
SPM-1791	G-SPM-684	A	16	40	16	42	These lines do not sufficiently capture the conclusions regarding unique and threatened systems of IPCC WGII. In the Technical Summary of WGII the comparable sentence (see page 68) reads: "There is new and MUCH stronger evidence of the ADVERSE impacts of observed climate change TO DATE on several unique and threatened systems. Confidence has increased that a 1-2°C increase in global mean temperature above 1990 levels poses significant risks to many unique and threatened systems, including many biodiversity hotspots." Recommend using this text, rather than the text in the current draft. (Government of Canada)	Taken into account in revised wording
SPM-1792	G-SPM-685	A	16	40	16	42	Replace this loose sentence by the following (from 5.2, page 2, lines 14-21) : "Significantly high adverse effects of climate change on ecosystems and species at lower temperatures and in the predictions of significant extinctions as a consequence of climate change are new findings since the TAR. Above 1.5-2.5oC global average temperature increase, predominantly negative effects on biodiversity and ecosystem services such as water and food supply are projected. Above 3.5-4oC warming significant (>40%) extinctions are projected." (Government of France)	Taken into account in revised wording

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1793	G-SPM-686	A	16	40	16	42	Isn't the risk what makes a system threatened? Which systems are we talking about? Natural ecosystems, technical systems, infrastructure etc. (Government of Sweden)	Accepted, wording revised
SPM-1794	E-SPM-1011	A	16	40	17	8	This large block of text says very little on its own. Would be much more useful if there was an update version of TAR WGII Figure SPM-2 to support the statement on p.17 that "there are stronger reasons for concern than in the TAR" (Donald Lemmen, Natural Resources Canada)	Burning embers figure was discussed but not supported by the entire author team.
SPM-1795	G-SPM-687	A	16	41	16	41	What specifically are "unique and vulnerable systems"? Ecological, cultural, economic...? (Government of United States)	Wording revised to clarify
SPM-1796	E-SPM-1012	A	16	43	16	44	There is also much more evidence about observed and attributable changes in extreme events than available at the TAR, which I think would be useful to add. (Gabriele Hegerl, Duke University)	Taken into account in revised wording
SPM-1797	E-SPM-1013	A	16	43	16	44	Is this really the major point here? Of course extreme weather events impact human and natural systems. Is the major step ahead really "how" vulnerable the systems are? On the pages above most of the discussion was about the "frequency" of extreme events and about their "severity" (e.g. the temperature extremes of heat waves. (Rolf Mueller, Research Centre Juelich)	Taken into account in revised wording
SPM-1798	G-SPM-688	A	16	43	16	44	This sentence is rather vague. Suggest to add the following sentence from WG 2 Section 19.3.7: "There is high confidence that a warming of up to 2°C above 1990-2000 levels would increase the risk of many extreme events, including floods, droughts, heat waves, and fires." (Government of European Community)	Too much detail; wording revised
SPM-1799	G-SPM-689	A	16	43	16	44	These lines do not sufficiently capture the conclusions regarding Risks of Extreme Events on page 2 line 28 to page 3 line 5 of Topic 5 of the Synthesis Report. This text only emphasizes that new evidence exists without telling the reader what that new evidence can tell us. Suggest adding the following: "This evidence has demonstrated a higher sensitivity to climate extremes in both developing and developed countries than previously understood and that observed climate change has already increased the intensity and/or frequency of some extreme events." (Government of Canada)	Taken into account in revised wording
SPM-1800	G-SPM-690	A	16	43	16	44	Complement the sentence with (from 5.2, page 2 lines 32-45, page 3 line 3) "in both developing and developed countries. These extreme events include projected increases in tropical cyclone intensities, decreased water availability and increased drought in the dry tropics and subtropics, increasing coastal damage from floods and storms with sea level rise, increased floods in many regions due to increased frequency of heavy rainfall, increased frequency and severity of heat waves very likely in many regions,	too much detail for SPM; wording revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of France)	
SPM-1801	G-SPM-691	A	16	44	16	44	suggest inserting "for frequency, duration and intensity" at the end of the sentence. (Government of Republic of Korea)	too much detail for SPM; wording revised
SPM-1802	E-SPM-1014	A	16	44			Would add an additional characteristic of climate change, itself, that increases vulnerabilities: Sequential extremes and decreased recovery times between extreme events. (Paul Epstein, Harvard Medical School)	too much detail for SPM; wording revised
SPM-1803	E-SPM-1015	A	16	45	16	47	High latitudes and high altitudes should also be mentioned here. The first for high exposure (was known before, but since TAR confirmed and both for being constrained and offering no option for spatial shifts of systems (poles, mountain tops). (Andreas Fischlin, Integrative Biology - Systems Ecology)	too much detail for SPM; wording revised
SPM-1804	G-SPM-692	A	16	45	16	47	The important message to policymakers about there being highly vulnerable groups in developed countries is missing here. Suggest adding "Recent work has shown that within developed countries, some population groups are also highly vulnerable" (abbreviated from WGII Technical Summary lines 20-22 page 68). (Government of Canada)	too much detail for SPM; wording revised
SPM-1805	G-SPM-693	A	16	45	16	47	The argumentation seems to confuse two aspects: "higher sensitivity" and "lower adaptive capacity" refer to greatest risk of low-latitude areas whereas "greater confidence in projected precipitation patterns" refers to new evidence. Reformulate sentence to make these connections clearer. Suggest for instance to reword as follows: "There is new evidence that low-latitude and less-developed areas are generally at greatest risk from climate change. However, recent work has shown that some population groups in developed countries are also highly vulnerable. In summary, there is high confidence that warming of 1-2 °C above 1990-2000 levels would include key negative impacts in some regions of the world (e.g. Arctic nations, small islands) and pose new and significant threats to certain highly vulnerable population groups in other regions (e.g. high altitude communities, coastal zone communities with significant poverty levels), with increasing levels of adverse impacts and confidence in this conclusion at higher levels of temperature increase. (Government of European Community)	too much detail for SPM; wording revised
SPM-1806	G-SPM-694	A	16	45	16	47	Reorganise the sentence : "There is new evidence, in particular from greater confidence in projection patterns, that low-latitude and less-developed ...lower adaptive capacity." (Government of France)	Wording revised.
SPM-1807	E-SPM-1016	A	16	47	16	47	The greater risk does not arise from the higher confidence in the precipitation patterns, so I would replace with something like 'large projected changes in precipitation'. (Nathan Gillett, University of East Anglia)	Accepted, wording revised.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1808	E-SPM-1018	A	16	47	16	47	Add: "...lower adaptative capacity(INCLUDING LOW AVAILABILITY OF FINANCIAL RESOURCES), and greater confidence...." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Wording revised
SPM-1809	G-SPM-695	A	16	47	16	47	The confidence in precipitation patterns is neither evidence nor does it produce a risk. Try: "... lower adaptive capacity and projected precipitation patterns (in which there is now greater confidence)." (Government of Netherlands)	Accepted, wording revised
SPM-1810	E-SPM-1017	A	16	47			It propagates a dangerous logical fallacy to state that risk is high due to greater confidence in projections. If anything, greater confidence normally entails less risk due to the ability to rule out the most disastrous outcomes which typically (should) dominate a risk calculation. This sentence should not cite the "greater confidence" but rather the serious nature of the predicted droughts in sensitive regions. (Steven Sherwood, Yale University)	Accepted, wording revised
SPM-1811	G-SPM-696	A	16	47			Add: "...lower adaptative capacity(INCLUDING LOW AVAILABILITY OF FINANCIAL RESOURCES), and greater confidence...." (Government of Cuba)	Wording revised
SPM-1812	E-SPM-1019	A	17	1	17	1	What are the "initial net market benefits"? It would not be clear to someone who hasn't read the third assessment report. (Katherine Casey Delhotal, RTI International)	see glossary
SPM-1813	G-SPM-697	A	17	1	17	2	Unclear (perhaps, incomplete) phrase: "There is some evidence that initial net market benefits from climate change will peak at a lower magnitude and therefore sooner,..." (Government of Russian Federation)	sentence seems correct and clear; no suggestion for change made
SPM-1814	E-SPM-1020	A	17	1	17	4	paragraph not clear, but clear in the correspondent section (Monica Beatriz Wehbe, National University Rio Cuarto)	Wording of paragraph revised
SPM-1815	E-SPM-1021	A	17	1	17	4	Jargon - what are 'net market benefits from climate change'? Omit 'magnitudes' as redundant. (John R. Porter, University of Copenhagen)	see glossary; magnitude relevant to distinguish from rate
SPM-1816	G-SPM-698	A	17	1	17	4	This bullet is weak and should be dropped. There is "some evidence" that the solar cycle has a major impact on extreme events, but this is viewed as weak and not brought forward in WG1. (Government of United States)	Rejected; the bullet is retained because WGII SPM found that the 5 reasons for concern remain a viable framework to consider key vulnerabilities; this phrase appropriately describes the available evidence for this reason for concern, consistent with the assessment in WGII

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
								chapter 19.
SPM-1817	G-SPM-699	A	17	1	17	4	This bullet is unclear. The statement must be clarified. This bullet might benefit from some background statement on the time trajectory of net benefits and losses. (Government of United States)	Wording revised.
SPM-1818	G-SPM-700	A	17	1	17	4	Net market benefits from climate change are mentioned; but, in general, benefits of climate change are not discussed adequately. There will be winners and losers, making mitigation much more difficult. (Government of United States)	More detailed discussion not possible within space constraints
SPM-1819	G-SPM-56	B	17	1	17	4	This paragraph discusses "net market benefits". From what we understand, the literature on global aggregate damage costs has high agreement and evidence that there are NOT net benefits from climate change at a global level. The TAR concluded that there will be net costs (1-5% of GDP), and social cost of carbon estimates are almost always positive, several are very high, and are expected to be underestimated. Therefore this paragraph does not seem to reflect the current literature. What is clear is that in the past few years there have been more recent estimates of damage costs - in both GDP terms and SCC terms - that have been higher than previous estimates - and this has created more concern. We suggest this paragraph is re-phrased: "There is some evidence that any net economic benefits of climate change will only be experienced at lower levels of climate change than was found in the TAR and that at higher temperatures damages will be greater than found previously.", Alternatively it could be replaced by that on Page 21 line 14-16. (Government of United Kingdom)	Quoted loss of 1-5% GDP is for warming of 4 deg C; statement here refers to the time trajectory of losses
SPM-1820	E-SPM-1022	A	17	2	17	2	lower magnitude of what? What is probably meant here is that the market may latch on at a lower degree of climate warming than anticipated before, therefore one may reap the benefits sooner. It's just a guess, but please clarify the text and don't let the reader guess. (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	wording revised
SPM-1821	G-SPM-701	A	17	2	17	2	For clarity insert "of warming" after "lower magnitude". (Government of Australia)	accepted
SPM-1822	G-SPM-37	C	17	2	17	3	Suggested rewriting: '...and that damages for larger magnitudes of global mean temperature increase would be higher than was concluded...'. (Government of Belgium)	unnecessary additional wording
SPM-1823	G-SPM-702	A	17	4	17	4	Change "previous" to "third" assessment. (Government of Canada)	accepted
SPM-1824	E-SPM-1023	A	17	5	17	7	This sentence is at best unclear (at worst deceptive), in relation to the heading of risks. Neither the magnitude nor the timing of the risk is mentioned. (Michael Manton, Monash University)	wording revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1825	G-SPM-704	A	17	5	17	7	Replace the first sentence by (from 5.2, page 4, lines 10-16) : "Ice sheet models project a gradual widespread loss of ice from the Greenland ice sheet if warming were to be sustained for millennia. There is, nonetheless, a risk that larger sea level contributions from the ice sheets could occur on century time scales, because ice dynamical processes not included in current models could increase the rate of ice loss, and could also lead to contributions from Antarctica. Complete deglaciation of the Greenland ice sheet would raise sea level by 7 metres and could be irreversible." (Government of France)	too much detail and repetition of earlier statement; wording revised
SPM-1826	G-SPM-57	B	17	5	17	7	See previous comments on Greenland. It would be helpful to say what additional information is available. This is an important point (Government of United Kingdom)	too much detail and repetition of earlier statement; wording revised
SPM-1827	E-SPM-1024	A	17	5	17	8	This sentence is a truncated version of WGII Chapter 19.3.7, and the meaning has been altered. The original referred to more specific information since the TAR with respect to Greenland and West Antarctic ice sheets. The omission of West Antarctic ice sheet in the SYR is misleading: more specific information on pertinent levels of warming is certainly available, although not from models. By myopically focusing only on model outcomes once again, this section provides the misleading impression that nothing has been learned about the risk from WAIS over the past 6 years. To give one small example, the collapse of the Larsen ice shelf in 2002 induced rapid glacier loss from the Antarctic Peninsula. Similar processes appear to be underway in the Amundsen sea embayment, and we have learned much about that area since 2002. There is even a risk that current warming is sufficient to deglaciade much of the Amundsen sea embayment. Furthermore, the paleoclimate analysis in WGI Chapter 6 indicates the possibility of an Antarctic contribution to Eemian sea level, based on work that is also new since the TAR. Taken together, these findings support a greater vulnerability of WAIS at lower temperature than inferred in the TAR. Accordingly, line 7 should be modified to add "and West Antarctic ice sheets". (Michael Oppenheimer, Princeton University)	too much detail and repetition of earlier statement; wording revised
SPM-1828	E-SPM-1025	A	17	5	17	8	The middle sentence here does not at all convey the increasing concern about the potential for rapid deterioration of the Greenland Ice Sheet--namely the early signs of accelerating change and the 4-6 m higher sea level during the very brief and not so much warmer Eemian. Somehow, this text seems to reflect a belief in the number in Table SPM-1 regarding sea level--and these number lack the influence of critical terms. Saying we have better information without saying what it is is really the sort of teasing that should be avoided--give the information, and give it forthrightly in talking about the risk of what could happen. (Michael MacCracken, Climate Institute)	too much detail and repetition of earlier statement; wording revised
SPM-1829	G-SPM-703	A	17	5	17	8	Risks of large-scale singularities.....the very important information from IPCC WGI about a potential temperature threshold for irreversible melting of the GIS has not been carried over into this text, although it IS in the text for this Reason for Concern in the WGII	too much detail and repetition of earlier statement; wording revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							Technical Summary (Page 68 line 31-38). Suggest adding a new sentence to follow the first: "A sustained global average warming above about 2.0°C (relative to pre-industrial) could trigger elimination of the GIS." (Government of Canada)	
SPM-1830	G-SPM-705	A	17	5	17	8	Does this science statement belong in this section? (Government of United States)	wording revised
SPM-1831	E-SPM-1027	A	17	7	17	8	Risk... very unlikely: this seems odd language (Gabriele Hegerl, Duke University)	accepted, wording revised
SPM-1832	E-SPM-1028	A	17	7	17	8	Is it correct to say that a risk is unlikely? It doesn't sound good to me. An event can be unlikely. A risk would rather be low. (Kenneth Möllersten, Swedish Energy Agency)	accepted, wording revised
SPM-1833	E-SPM-1029	A	17	7	17	8	Insert: "As assessed by current models" at beginning of sentence and "considered as" towards the end. (So reads: "As assessed by current models, the risk of large-scale abrupt changes on ocean circulation during the 21st Century is considered as very unlikely". Comment: I am amongst those who find themselves very concerned that current modelling of potential discontinuities, particularly the MOC, is inadequate to the task, in that a discontinuity is almost de facto impossible to model. I therefore, unfortunately, cannot persuade myself I have genuine confidence in the confidence assessments used throughout AR4 on this particular issue. I think the wording I am proposing here finds a way out for those of us who have this particular doubt, without particularly prejudicing the existing WG-1 and WG-2 conclusions. (Pat Finnegan, Grian)	wording revised, specific reference deleted
SPM-1834	E-SPM-1030	A	17	7	17	8	Either delete "The risk of" or change "unlikely" to "low". (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	accepted, wording revised
SPM-1835	E-SPM-1031	A	17	7	17	8	a risk cannot be "likely" , can ist? rephrase. (Rolf Mueller, Research Centre Juelich)	accepted, wording revised
SPM-1836	E-SPM-1026	A	17	7			Use of the term "risk" should be consistent throughout the document. Conventionally, and elsewhere in the document, this term refers to the product of probability and hazard. Here, it is used to describe probability only and is assigned the value "unlikely" Risks should be low or high, not likely or unlikely. This particular risk may not be low either, because the hazard associated with a major ocean circulation change would be great. (Steven Sherwood, Yale University)	accepted, wording revised
SPM-1837	E-SPM-1034	A	17	8	17	8	"unlikely" should be replaced by 'small' (Jon Egill Kristjansson, University of Oslo)	accepted, wording revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1838	E-SPM-1033	A	17	8	17	9	Add: ".....century is very unlikely. THE POSSIBILITIES OF IRREVERSIBLE DAMAGES TO FRAGILE ECOSYSTEMS. (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	No clear suggestion made; wording revised for other comments
SPM-1839	E-SPM-1032	A	17	8			Another category that needs emphasis: The potential for non-linear changes in impacts (e.g., for coral reefs and/or forests). (Paul Epstein, Harvard Medical School)	too much detail and repetition of earlier statement; wording revised
SPM-1840	E-SPM-1035	A	17	10	17	12	Add at end "as long as climate change remains limited." First this is the case mostl only for the near future (~1st half of 21st century). Only if we go very much into the future, i.e. at least several centuries and reach new equilibria, can we expect some beneficial effects again such as fully realized productivity gains at high latitudes even for more pronounced climate changes. The latter gains could be mentioned here as well, but would need to be explained well and the uncertainties are considerable. Intermediate phases (>~2050) are dominated by negative impacts except for very drastic emissions reduction pathways (see also next bullet). Moreover, balance between positive and negative impacts varies considerably also from region to region, a fact which should also be touched upon here. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Wording revised
SPM-1841	G-SPM-706	A	17	10	17	12	This sentence seems to represent a clear summary of the five "reasons for concern" and could possibly replace, or be integrated in the bold text on p 16 (line 28-31) (Government of Norway)	Taken into account in crafting new headline
SPM-1842	G-SPM-707	A	17	10	17	12	The paragraph further below (lines 34-37) discussing DAI could be moved up to follow immediately after these lines, in order to improve the flow of text here. The discussion of DAI really is tied to that of Reasons for Concern and so should be grouped with that discussion, rather than under a bolded heading that stresses the need for adaptation. Furthermore, the discussion of DAI is minimal, as it stands, and the section should be strengthened (and highlight what's new since the TAR) by adding text from the full SYR, Topic 5. Suggest using three short sections as a basis: page 13, lines 32 to 37 and lines 44 to 46, and page 14, lines 7 to 9). (Government of Canada)	Accepted, moved to front
SPM-1843	G-SPM-58	B	17	10	17	12	P17 Line 10-12 is a very significant finding and could be added to an introductory paragraph which says what is new since the TAR. (Government of United Kingdom)	Inappropriate to use a key finding as introduction; has been turned into a headline for visibility
SPM-1844	G-SPM-708	A	17	11	17	12	The sentence now ist too ambigious. Therefore: Full stop after "Third Assessment Report". Delete "even though some benefits ... systems and sectors.", because it weakens the important statement before, instead of supporting it. (Government of Germany)	Taken into account in crafting new headline

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1845	E-SPM-1036	A	17	11			The reference to “some benefits” of climate change should be qualified by the addition of “within limited temperature ranges and rates of warming” to be consistent with the statement on net aggregate impacts (lines 1-4) on the same page. (Alan Miller, International Finance Corporation - CESEF)	Taken into account in crafting new headline
SPM-1846	G-SPM-59	B	17	12			Add "at low temperature changes" to the end of the sentence - as it is misleading otherwise. (Government of United Kingdom)	Taken into account in crafting new headline
SPM-1847	E-SPM-1037	A	17	14	17	15	This statement could be rewritten to place more emphasis on the need for adaptation as it will be required no matter what is done in terms of mitigation. Suggestion - Adaptation will be necessary as many impacts will still occur despite implementation of mitigation strategies. (Sharon Smith, Geological Survey of Canada)	Taken into account, wording revised
SPM-1848	E-SPM-1038	A	17	14	17	15	Seems very odd to introduce the concept that adaptation is necessary after you have presented many detailed findings on the role of adaptation and linkages to mitigation in previous sections. (Peter Berry, Health Canada)	Section revised
SPM-1849	G-SPM-709	A	17	14	17	15	This sentence should be inverted to put the message about the need for adaptation first. Also, it should be better explained why adaptation is needed and pointed out that in some cases, adaptation will not prevent impacts. Therefore, suggest the following revisions: "Adaptation is necessary because some impacts are unavoidable given current commitments to warming. In some circumstances, however, adaptation will not be able to prevent impacts. Many other impacts can be avoided, reduced or delayed by mitigation." (Government of Canada)	Taken into account, wording revised
SPM-1850	G-SPM-711	A	17	14	17	15	Include figure 5.1 - very useful figure and more information from topic 5 on relationship between adaptation and mitigation. (Government of Germany)	Rejected – figure deleted for space reasons in longer report, and due to other negative comments
SPM-1851	G-SPM-60	B	17	14	17	15	This sentence seems to give the impression that we can avoid most impacts. But we are already committed to decades of impacts. It would be worth highlighting the need to mitigate to avoid the worst impacts. (Government of United Kingdom)	Revised wording addresses this concern
SPM-1852	G-SPM-710	A	17	14	17	37	This section is missing key information about the types of impacts that could be avoided if global warming was limited. Text could be inserted from topic 5 page 11 lines 18-49 and page 11 lines 1-3. A link needs to be made between impacts avoided for different levels of global warming and the associated CO ₂ -eq stabilisation ranges. This is inferred in the SYR SPM at page 17 line 37, but it needs to be more explicit. (Government of Australia)	Specific detail cannot be given in SPM; reference to Table SPM-2 is made for examples

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1853	G-SPM-712	A	17	14	17	37	Figure 5.1 of Topic 5 could illustrate the considered issue and may help to reduce the text. (Government of Finland)	Rejected – figure deleted for space reasons in longer report, and due to other negative comments
SPM-1854	G-SPM-713	A	17	15	17	15	Need to specify what is to be stabilized – CO ₂ , climate...? WG3 does consider different kinds of stabilization scenarios (e.g., concentrations, forcing). (Government of United States)	Section revised to provide better introduction of stabilisation
SPM-1855	G-SPM-716	A	17	17	17	17	The authors need to explain why alternative emission pathways have an "increasing" influence on the rate of climate change. (Government of Australia)	Relevant text deleted; covered earlier in SPM
SPM-1856	G-SPM-714	A	17	17	17	19	This very short paragraph does not present sufficient coverage of the discussion in the underlying Synthesis Report about the benefits of mitigation (section 5.7 in particular). Suggest including the following text from Section 5.7 page 12 of Topic 5 in the Synthesis report: "The scale and timing of greenhouse gas mitigation involves balancing the economic costs of more rapid emissions reductions now against the corresponding medium-term and long-term climate risks of delay (high agreement, much evidence). In addition, climate sensitivity is a key uncertainty for risk management and in particular for mitigation scenarios that aim to meet a specific temperature level: if climate sensitivity is high, then the timing and level of mitigation is earlier and more stringent than when it is low." (Government of Canada)	Taken into account in revised section
SPM-1857	G-SPM-715	A	17	17	17	19	This sentence is not written very clearly. Suggest rewriting it as follows: "Projected warming out to 2030 is largely insensitive to future emissions pathway (WG1 SPM). The rate and magnitude of global climate change and the associated impacts incurred (or avoided) in the second half of the 21st century and beyond depend more on the emissions pathway." {5.3, 5.7} (Government of United States)	Relevant sentence deleted; covered earlier in SPM
SPM-1858	G-SPM-717	A	17	17	17	19	Please be more specific on what you mean by increasing influence. (Government of Sweden)	Relevant sentence deleted; covered earlier in SPM
SPM-1859	G-SPM-61	B	17	17	17	19	Suggest rephrase for clarity: "Alternative emissions pathways have an increasing influence ... avoided over time. The divergence of impacts for different pathways becomes clear in the second half of ..." then explain what this means for policy – i.e. some amount of climate change is unavoidable. Mitigation decisions taken now moderate the longer term risks. Adaptation is required to moderate near-term risks. (Government of United Kingdom)	Relevant sentence deleted; covered earlier in SPM

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SPM-1860	G-SPM-718	A	17	18	17	18	Replace "are" by "would be", for the incurred or avoided impacts refer to a projection in the second half of the 21st century and beyond. (Government of Republic of Benin)	Text shifted and revised
SPM-1861	G-SPM-38	C	17	18	17	18	'...global climate change and on the impacts that...'. (Government of Belgium)	Text shifted and revised
SPM-1862	G-SPM-719	A	17	21	17	21	No antecedent to the pronoun "it" – sentence is unclear. (Government of United States)	Text revised to make links clear
SPM-1863	E-SPM-1040	A	17	21	17	23	This section is poorly written. The examples provided are not impacts but rather responses of natural systems to changes in climate. It is not clear what the impact is that we are adapting to (the impacts for the reponses given would be, decrease in water resources, rises in sea level etc.). Section 5.3 in SYR is much clearer and it appears that parts of this were cut and pasted into the SPM but it really does not make sense. It may also be better if the examples were not included at all. (Sharon Smith, Geological Survey of Canada)	Section revised to provide better logical flow
SPM-1864	E-SPM-1042	A	17	21	17	23	This discussion would better be phrased in context of there being limits to adaptation, particularly for key vulnerabilities in the biophysical systems. Inclusion of "very costly" is deceiving because in many cases no amount of money would solve the problem, and may be confusing given the very important statement on p. 14 that "viable adaptation options can be implemented at low cost, and/or with high benefit-cost ratios". (Donald Lemmen, Natural Resources Canada)	Section revised to provide better logical flow and address specific problems raised
SPM-1865	E-SPM-1043	A	17	21	17	23	It is not clear what is meant by costly adaptation for loss of biodiversity. Is it costly for human populations to adapt to a loss of biodiversity? It seems that the loss of biodiversity is an adaptation of a natural system to deal with change so it isn't clear how it is costly for a natural system to adapt (see also comment above [TSU note: See Comment E-1040-A]). It is also suggested that "adaptation is ineffective for some key vulnerabilities" replace "adaptation is very limited or very costly" (Sharon Smith, Geological Survey of Canada)	Section revised to provide better logical flow and address specific problems raised
SPM-1866	E-SPM-1039	A	17	21	17	25	We suggest inserting a sentence between the two to say that 'Adaptation to current weather extremes and climate variability can increase resilience to climate change.' Alternatively 'and increase resilience to climate change' can be added after 'risks'. In the proposed sentence it could also be recognised that adaptation can significantly reduce risks because it is seldom undertaken alone but integrated in water resource management, coastal defence, and risk reduction strategies (see SPM WGII and chapt 17:2 and 17:5) (Silvia Llosa, International Strategy for Disaster Reduction)	Specific adaptation options have been discussed earlier; this section is about limits to adaptation
SPM-1867	E-SPM-1041	A	17	21	17	25	This paragraph about limits has no direct parallel in the discussion on topic 4. The discussion on topic 4 on the limits to adaptation is good, in the SPM its missing something. In the SPM it prpobably needs to say that there are technical limits to adaptation such as the difficulties or	Wording revised to capture this

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							replacing glaciers or maintaining atolls in the face of SLR, and even where technologies may be theoretically effective there are limits to their implementation - for example Bangladesh doesn't have the capital to do for the Ganges Brahmaputra delta what the Netherlands has done with its coast. Indeed these points could be made more clearly in topic 4 too. (Jon Barnett, University of Melbourne)	
SPM-1868	E-SPM-1044	A	17	21	17	25	I don't understand - if you are incurring very high social costs in adaption efforts (e.g., a high number of deaths) how could this possibly achieve an "effective reduction of climate risks"? (Peter Berry, Health Canada)	Taken into account; wording revised
SPM-1869	E-SPM-1045	A	17	21	17	25	Emphasis on "solely on adaptation" and negative social, environmental economic costs is critical--recommend boldface. Many states today increasingly focus on adaptation at the expense of mitigation. (Peter Liotta, Pell Center for International Relations and Public Policy)	Taken into account; wording revised
SPM-1870	G-SPM-720	A	17	21	17	25	Is it possible to be even clearer on this point without being policy prescriptive and write something like "doing nothing would cost much more for the society in the future due to climate change than investing in minimising the climate change. Economics is often understood from politicians." (Government of Sweden)	This is not substantiated as proposed in the underlying report ; economic comparison is now made more explicitly at end of report
SPM-1871	G-SPM-722	A	17	23	17	23	Suggest: "Reliance solely on adaptation WITHOUT ANY MITIGATION could allow..." (add words in CAPS). (Government of Canada)	Taken into account in revised wording
SPM-1872	G-SPM-723	A	17	23	17	23	Replace "could" by "would" (Government of France)	Taken into account; wording revised
SPM-1873	G-SPM-721	A	17	23	17	25	This sentence understates the risks associated with a climate strategy that relies solely on adaptation (i.e. that excludes mitigation). Some risks of large climate change, including risks to biodiversity and to coastal zones, simply cannot be eliminated with any imaginable measures. Hence, the term "impossible or" should be added before "possible only...". (Government of European Community)	Taken into account; wording revised
SPM-1874	E-SPM-1046	A	17	24	17	24	Please insert: 'significantly that irreversible, and unmanagable effects would happen and that effective reduction ...' (Manfred Treber, Germanwatch)	Taken into account; wording revised
SPM-1875	G-SPM-62	B	17	25			Add "and may not be feasible in some circumstances." (Government of United Kingdom)	Taken into account; wording revised
SPM-1876	G-SPM-724	A	17	27	12	27	add to end of statement "and, in polar regions, reduction in sea ice cover." Working Group II Chapter 15.4.6.1	Comment not clear, does not seem to make sense in this

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of Canada)	context?
SPM-1877	E-SPM-1048	A	17	27	17	28	Based on my read of the IPCC AR4, long-term risks associated with SLR depend on the level at which greenhouse gas concentrations are stabilised, irregardless of when that occurs. I also interpreted the assessment to indicate that the pathway towards stabilisation is also relevant. (Roger Street, UKCIP-OUCE)	Wording revised to make time scales clearer.
SPM-1878	E-SPM-1047	A	17	27	17	32	While the text does cover some aspects of the issue, it totally fails to indicate the real limits in our understanding and the importance of not being able to represent dynamical ice flows--so the lubrication underneath, the lifting of the ice sheets, etc. that can lead to rapid loss. (Michael MacCracken, Climate Institute)	Text revised to make these issues more transparent
SPM-1879	E-SPM-1049	A	17	29	17	29	The time scale for the several metres rise should be included (Michael Manton, Monash University)	This is now made clearer in additional text on sea level rise
SPM-1880	G-SPM-725	A	17	29	17	29	This statement seems to exaggerate Table SPM-3. Drop "inexorable", and remove "several meters" as it only refers to the upper end of the range for one scenario. Try: "will cause a sea-level rise of from 1 to 3 meters for the higher...." (Government of United States)	Taken into account and wording revised.
SPM-1881	G-SPM-726	A	17	29	17	29	The word "inexorable" does not sound very common. Please choose another word (Government of Sweden)	accepted
SPM-1882	G-SPM-727	A	17	29	17	29	Many readers may not be familiar with the term "inexorable". We propose to replace with a more familiar term. (Government of Norway)	accepted
SPM-1883	E-SPM-1050	A	17	29			Change "meters" to "metres" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	editorial, accepted
SPM-1884	E-SPM-1051	A	17	30	17	30	Replace 'imply' with 'infer' as you are talking about a consequence of something. (John R. Porter, University of Copenhagen)	rejected; imply seems to be more appropriate
SPM-1885	G-SPM-728	A	17	30	17	30	Add after in Table SPM-3 " Melting of ice sheets will further contribute to sea level rise by a significant amount that the limited knowledge of ice sheet flow rates makes difficult to assess. (Government of France)	Taken into account, additional paragraph added
SPM-1886	E-SPM-1052	A	17	30	17	32	It is unclear what is meant by stabilising sea level rise. If the sea level rise stabilises the rise will occur at a stable rate? The sentence seems to say that the rate at which the level rises will stabilise and stay stable for over a millennium and then (presumably) become unstable again. (Kenneth Möllersten, Swedish Energy Agency)	accepted, replaced by "stabilise rising sea level"

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1887	G-SPM-729	A	17	31	17	31	“stabilize sea-level rise” doesn’t make sense. A rising sea level isn’t stabilized. Consider: “...would not prevent additional sea-level rise for more than a millennium.” (Government of United States)	accepted, replaced by “stabilise rising sea level”
SPM-1888	E-SPM-1053	A	17	31	17	32	Sea level rise is also addressed on page 9. These two parts of the summary need to be connected -- preferably by putting all the information about sea level rise in one place and then pointing the reader to that place where there is a reason to do so in a related topic. (Noel Gurwick, Carnegie Institution)	SPM has been restructured to provide better flow; this section looks at sea level from a damage avoidance perspective, which is different from a forward projection
SPM-1889	E-SPM-1060	A	17	34	17	34	"A scientific assessment of climate change alone cannot" (John Church, CSIRO)	Taken into account in revised wording; para shifted to front of section 5
SPM-1890	E-SPM-1054	A	17	34	17	37	This paragraph covers a key issue for policymakers and so (even if this is all that can be said) it should be more prominent. At least it could be moved to the start of this section (page16,line28). (Michael Manton, Monash University)	Taken into account in revised wording; para shifted to front of section 5
SPM-1891	E-SPM-1055	A	17	34	17	37	This is the only statement in the SPM regarding Article 2 and it is far too important to buried at the end of this section. It should be a bolded statement, and supporting text can be added if necessary. (Donald Lemmen, Natural Resources Canada)	Taken into account in revised wording; para shifted to front of section 5
SPM-1892	E-SPM-1056	A	17	34	17	37	This is fence sitting and weak. Table SPM-2 shows clearly that temperature rises above about 2degC relative to 1980-99 start to induce changes that are serious or very serious in all sectors. This translates to GHG concentrations of between 450-500 ppm CO2-eq. This has to be the threshold for dangerous climate change and IPCC cannot sit on a post-modernist fence talking about 'value judgements' etc when its own scientific analysis shows the dangers of GHG levels above 450-550 ppm. (John R. Porter, University of Copenhagen)	The IPCC assessment does not allow a single threshold to be identified; normative judgements are needed but cannot be made by IPCC
SPM-1893	E-SPM-1057	A	17	34	17	37	Is this really the best we can do? I recommend at least including some examples here of observed and projected climate change -- and effects of climate change -- that could plausibly be considered dangerous. (Noel Gurwick, Carnegie Institution)	Taken into account in revised wording; para shifted to front of section 5
SPM-1894	E-SPM-1058	A	17	34	17	37	From a developed country perspective - I understand that some studies have linked climate change to the 2003 heatwave in Europe that killed 35 000 people. Would this not suggest that we have reached "dangerous anthropogenic interference". I expect the health community might become more inclined to make statements about what constitutes this level of interference. (Peter Berry, Health Canada)	Taken into account in revised wording; para shifted to front of section 5

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SPM-1895	E-SPM-1059	A	17	34	17	37	Also here the ethical dimension should be highlighted: "involves value AND ETHICAL judgements" (Martin Welp, University of Applied Sciences Eberswalde)	Taken into account in revised wording; para shifted to front of section 5
SPM-1896	G-SPM-730	A	17	34	17	37	It should be stated more clearly here that a lot of risks start taking off at 2-3 C (cf SPM Table 2). The scientific information such as presented above shows rapidly increasing risks starting in this intervall. (Government of Sweden)	The IPCC assessment does not allow a single threshold to be identified; normative judgements are needed but cannot be made by IPCC
SPM-1897	G-SPM-731	A	17	36	17	37	The sentence beginning with "However, such considerations ..." may be deleted. (Government of India)	Rejected, but wording revised; this is the key role of scientific input and part of the mandate of IPCC
SPM-1898	G-SPM-732	A	17	36	17	37	The sentence "However, such considerations can be informed by scientific information such as presented above" seems to be difficult to understand. We suggest: "However, such considerations can be made with the help of scientific information such as presented above" (Government of Norway)	Wording revised.
SPM-1899	E-SPM-1061	A	17	36			Replace the overused phrase "space and time" with "societies and stages of development". (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	Wording revised
SPM-1900	E-SPM-1062	A	17	37	17	37	To replace "informed" with "included" or other more suitable word (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	rejected; informed seems more appropriate here.
SPM-1901	E-SPM-1063	A	17	37	17	37	Replace "can be informed" by "are to be informed" or "need to be informed also" or similar. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected; this would create a policy prescriptive tone
SPM-1902	E-SPM-1064	A	17	37	17	37	"informed by AND BASED ON" (Harald Winkler, Energy Research Centre, University of Cape Town)	Rejected; this would create a policy prescriptive tone
SPM-1903	G-SPM-733	A	17	37	17	37	It is suggested to change "can" to "could". (Government of China)	Rejected; can is appropriate and part of the mandate of the IPCC
SPM-1904	G-SPM-39	C	17	37	17	37	Replace 'informed' by 'documented'. (Government of Belgium)	Rejected; suggestion does not seem to make sense in context?
SPM-1905	E-SPM-1065	A	17	39	17	39	Would re-word for clarity to state ".....to meet any of the assessed stabilisation levels as hown in Table SPM-3." (Nick Campbell, ARKEMA SA)	Specific wording deleted; point covered in revised SPM

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1906	E-SPM-1067	A	17	39	17	39	Suggest reword to "Global emissions must decline from present or peak levels to meet" (John Church, CSIRO)	Specific wording deleted; point covered in revised SPM
SPM-1907	G-SPM-735	A	17	39	17	40	The wording "must peak" is misleading for non-native speakers and non-experts. They might think that emissions must reach a threshold, but actually emissions must stay below a certain value, and then decline. Please clarify, e.g. by an explanation in brackets: "...must peak (i.e. must not exceed a certain value) and then decline..." (Government of Germany)	Specific wording deleted; point covered in revised SPM
SPM-1908	G-SPM-40	C	17	39	17	42	" Give indication about when the peak must happen (for different scenarios)" (Government of Belgium)	Specific wording deleted; point covered in revised SPM
SPM-1909	E-SPM-1068	A	17	39	17	49	Fundamental point but needs to be written more clearly (Stephan Halloy, Conservation International)	Specific wording deleted; point covered in revised SPM
SPM-1910	G-SPM-734	A	17	39	17	49	theoretically CO2 level can be stabilized through gradual reduction of anthropogenic CO2 emissions practically to zero. Thus, this paragraph is about temporary stabilization that should be mentioned in some way. (Government of Russian Federation)	Taken into account in revised wording
SPM-1911	E-SPM-1066	A	17	39			The effect of a non-stabilization emissions scenario is not mentioned but needs to be clarified. Also, the effect of possible 'peak oil' scenarios, as now recognized by the IEA etc, needs to be noted. (Joe Ravetz, University of Manchester)	Non-mitigation was discussed earlier; they include issues surrounding conventional reserves
SPM-1912	G-SPM-736	A	17	40	17	42	This sentence can be more affirmative and refer to the need for early peaking for the lower stabilisation levels. (Government of European Community)	Rejected; the sentence appears to be affirmative already?
SPM-1913	E-SPM-1070	A	17	41	17	41	"long-term" needs to be defined. If long-term is over millennia (eg) would the development within the next decades really matter that much taking into account that on the long term GHGs released can/will largely disappear making GHG levels (and thus temperature changes) reversible? (Kenneth Möllersten, Swedish Energy Agency)	There is insufficient evidence in the literature of realistic scenarios with sustained negative emissions that would permit a substantial overshoot and still achieve low stabilisation levels. As per WGI findings, emissions today will continue to influence climate for more than a millennium.
SPM-1914	G-SPM-738	A	17	41	17	41	Suggest: "to achieve lower stabilization levels and THUS LOWER long-term temperate changes." (Government of United States)	Taken into account; revised wording links this to avoided impacts

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1915	G-SPM-737	A	17	41	17	42	The text reads now "resulting long term equilibrium temperate changes". Should this mean "resulting temperate long term equilibrium changes" or "resulting lower long term equilibrium temperatures" as in the SPM of WG3? (Government of Finland)	should have read "temperature"; text revised for other reasons
SPM-1916	E-SPM-1069	A	17	41			Could change "resulting" to "thus lower" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	should have read "temperature"; text revised for other reasons
SPM-1917	E-SPM-1071	A	17	42	17	42	"...long term equilibrium temperature changes." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	should have read "temperature"; text revised for other reasons
SPM-1918	E-SPM-1072	A	17	42	17	42	"temperate changes. {5.4}" should read "temperature changes. {5.4}" (Chiu-Ying Lam, Hong Kong Observatory)	should have read "temperature"; text revised for other reasons
SPM-1919	G-SPM-739	A	17	42	17	42	Change 'temperate' to 'temperature.' (Government of United States)	should have read "temperature"; text revised for other reasons
SPM-1920	E-SPM-1073	A	17	44	17	46	It is really misleading to focus so much on thermal expansion, which only gives the minimum of what the changes could be. Once Greenland starts to go, and it may already have started, the change is likely irreversible--there are no such ice sheets anywhere else, etc. and indications that much was lost during past interglacials. This is all much too sanguine. (Michael MacCracken, Climate Institute)	Accepted; additional paragraph included to discuss ice sheet changes
SPM-1921	G-SPM-740	A	17	44	17	49	This short paragraph is all the text there is to talk the reader through Table SPM-3 and Figure SPM-8. The table and Figure are quite easily grasped, but key messages should be reinforced in the text. Only one conclusion is drawn at present (lines 47-49). Suggest adding the following text drawn from page 8 lines 25-34 of Topic 5 of the Synthesis Report: "Emission reductions required to meet a particular stabilization level, as reported in Table SPM-3, may be underestimated given uncertainties about climate sensitivity, as illustrated in Figure SPM-8." (Government of Canada)	Taken into account; paragraphs on carbon cycle and climate sensitivity uncertainties added in later discussion
SPM-1922	E-SPM-1074	A	17	46	17	46	Should emphasize in this statement that the equilibrium SLR is due to thermal expansion only (i.e. does not include contribution of ice sheet melting) (Roger Street, UKCIP-OUCE)	accepted; wording revised accordingly
SPM-1923	G-SPM-41	C	17	46	17	46	Replace ...(See also Figure SPM-8:) by (see also Figure SPM-8). (Government of Belgium)	editorial; text revised

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-1924	E-SPM-1076	A	17	47	17	47	change 'SPM-8' to 'SPM-7' (Suam Kim, Pukyong National University)	editorial; text revised
SPM-1925	E-SPM-1075	A	17	47	17	48	Suggest “brings forward in time ” instead of “advances” to reduce the chance of confusion that advance means later in time. (Nathaniel Bindoff, CSIRO MAR and University of Tasmania)	Text deleted and replaced by simpler wording
SPM-1926	G-SPM-741	A	17	47	17	49	The phrase ‘advances the date’ appears to imply the opposite of the intended meaning (i.e., emissions must peak later to stabilize at lower concentrations). Phrase should be changed to imply that the date of the emissions peak must be closer to the present in order to stabilize at lower concentrations. (Government of United States)	Text deleted and replaced by simpler wording
SPM-1927	E-SPM-1077	A	17	48	17	48	advances' is a bit unclear here, since it could mean 'moves forward in time' or 'brings closer'. Replace with 'brings closer'. (Nathan Gillett, University of East Anglia)	Text deleted and replaced by simpler wording
SPM-1928	E-SPM-1078	A	17	48	17	48	“...and require greater emission reductions by 2050.” (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Text deleted and replaced by simpler wording
SPM-1929	G-SPM-42	C	17	48	17	48	Replace ‘...emissions reductions...’ by ‘...emission reductions...’. (Government of Belgium)	Text deleted and replaced by simpler wording
SPM-1930	E-SPM-1079	A	18	1	18	3	Including the sea level column in the table when it is only from thermal expansion is seriously misleading--the temperature estimate includes all likely feedbacks, known and unknown, by using a climate sensitivity derived from multiple sources--but the sea level term includes the effects of only one process, and likely not the only important one--very misleading. (Michael MacCracken, Climate Institute)	Accepted; additional paragraph included to discuss ice sheet changes
SPM-1931	G-SPM-742	A	18	2	18	2	For a better understanding, the title of the 3rd column of Table SPM-3 needs some additional words. In this regard, we suggest to add: "for all long-lived GHG". (Government of Republic of Benin)	rejected; CO ₂ equivalent has been defined
SPM-1932	E-SPM-1080	A	18	2			Has 'TAR' been defined at this stage? (Michel Rixen, NATO Undersea Research Center)	yes
SPM-1933	E-SPM-1081	A	18	4	18	7	It is very important to show the difference between CO ₂ concentration and CO ₂ equivalent concentration. However, we can see the definition of them in the later page, Box 2.1. Therefore, I recommend that Box.2.1 is described in the introduction. (Koki Maruyama, Central Research Institute of Electric Power Industry (CRIEPI))	Space limitations prevent this; glossary contains this information; also footnote in section 2 of SPM provides information on CO ₂ equivalent
SPM-1934	E-SPM-1082	A	18	8			Ranges in this table correspond to the 15th and 85th percentiles. All other ranges in this summary (I think) refer to the 10th and 90th percentiles (the likely range). Is there a good reason for this difference?	Yes – this is how the assessment in the underlying report was done

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							(Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	
SPM-1935	G-SPM-743	A	18	10	18	10	Climate sensitivity is a very important parameter and deserves a brief explanation also in the SPM. (Government of Sweden)	Accepted, added at end of section 5.
SPM-1936	E-SPM-1083	A	18	10			after "climate sensitivity is 3degC" insert "for a doubling of CO2 concentration from its pre-industrial value". (Joanna Haigh, Imperial College)	Unnecessary detail; more information contained in longer report and glossary
SPM-1937	G-SPM-63	B	18	10			Please add a definition of climate sensitivity and clarify that the presented ranges do not include the climate - carbon cycle feedback (Government of United Kingdom)	Definition of climate sensitivity too much detail for SPM, contained in glossary and longer report; implications of carbon cycle feedbacks are now included.
SPM-1938	E-SPM-1084	A	18	16	18	16	"...is expected to be at equilibrium." Why don't you stress that the sea-level rise as discussed here corresponds to a low limiting value? (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Taken into account; text revised to make this clearer.
SPM-1939	G-SPM-744	A	18	16	18	17	What is meant by "equilibrium" ? Polar ice sheets are not in equilibrium in a warming climate. (Government of Netherlands)	Correct; this is why this refers only to thermal expansion
SPM-1940	E-SPM-1085	A	18	17	18	18	This quite hidden caveat needs much more exposure--it is critical. The statement itself needs to be amended to indicate that the omitted terms are likely much larger, over times to stabilization, than the terms accounted for. A rough estimate from paleoclimatic records suggests that the sensitivity of global sea level to change in global average temperature is likely something like 10 to 20 meters per degree--which is far more than thermal expansion. (Michael MacCracken, Climate Institute)	Accepted and now stated in new para in main text.
SPM-1941	G-SPM-745	A	18	17	18	18	Using a single value for the climate sensitivity gives an underestimate of the uncertainty in the given values for warming and sea level rise. Significant partial melting of polar ice sheets is likely to occur for the warmer scenario's. So the indicated sea level rise is likely to be a misleading underestimate of the total sea level rise to be expected. Please indicate in line 11 which equilibrium is referred to, the equilibrium timescale of oceanic mixing or that of polar ice sheets. (Government of Netherlands)	Uncertainty of climate sensitivity is shown in Figure
SPM-1942	E-SPM-1086	A	18				Table SPM-3: why is the first column called "Category" and not "Scenario"? This is somehow confusing. More in general: what is the relation between the data in this table and those in table SPM-2 and in figure SPM-5? These three objects seem to talk about the same thing, but the report does not say explicitly whta their relationship is.	These are groups of scenarios, not individual scenarios. Heading of table amended to give more information.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Marco Mazzotti, ETH Zurich)	
SPM-1943	E-SPM-1087	A	18				Table SPM-3: In view of the strong expectation that there will be additional sea level rise from ice melt, I suggest adding after this sentence the following: "Hence these projected sea-level rise estimates are very conservative." (Claire Parkinson, NASA Goddard Space Flight Center)	Accepted and taken into account in new para in main text.
SPM-1944	E-SPM-1088	A	18				Table SPM-3: and the first lines of the caption: the units used here should be "mixing ratio", which indicates an amount per amount of air (e.g., mass per mass), rather than "concentration", which indicates a number per volume (e.g., molecules/cm ³) (Mark Lawrence, Max Planck Institute for Chemistry)	Rejected, as this would be confusing for policymakers; concentrations are commonly given in ppm.
SPM-1945	E-SPM-1089	A	18				Table SPM-3: A comparison should be made with Table SPM-1 as mentioned earlier (in 18) [TSU note: See Comment E-SPM-465-A]. Policymakers need to compare 2000 and different scenarios CO2 concentrations, CO2-equivalent concentrations etc. Also a problem regarding the coherence in temperature (see 33) [TSU note: See Comment E-SPM614-A] Categories I to VI are not defined; Better name: Category of stabilisation? (Annick Douguédroit, Université de Provence)	Revised figure SPM-6 provides this comparison.
SPM-1946	E-SPM-1090	A	18				Table SPM-3, Sea level column: This table is very misleading as it ignores any contribution from glaciers and ice sheets. One of the major concerns in the melting of the Greenland Ice Sheet and this table fails to convey this concern and in fact implies we only need to worry about thermal expansion. (John Church, CSIRO)	Role of ice sheets now explicitly stated in new para in main text.
SPM-1947	E-SPM-1091	A	18				Table SPM-3 I have strong objections to using only the best estimate sensitivity of 3 in this table to derive the temperature change range. This gives completely the wrong message about the level of uncertainty in temperature change and sea level rise. Please change using the likely sensitivity range of 2-4.5!! And add a caveat that due to changes in feedbacks in a substantially warmer climate, climate sensitivity is a problematic concept for changes involving upper end CO2 ranges (possibly earlier)... Based on the pdf of equilibrium climate sensitivity, the probability that climate sensitivity is exactly 3 is zero. if you give a tight range around 3, its still a small probability! (Gabriele Hegerl, Duke University)	Rejected; the range of uncertainty can be seen from the figure that is placed next to the table
SPM-1948	E-SPM-1092	A	18				Table SPM-3 and Figure SPM-8 overlap much information and I suggest that Figure SPM-8 is removed and that Table SPM-3 is radically simplified: Remove the first column and the last two (this information has already been provided), Remove footnotes. (John R. Porter, University of Copenhagen)	Rejected; footnotes are necessary to provide additional information. Figure provides additional information on emissions pathway and range of uncertainty of equilibrium temperatures.

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SPM-1949	E-SPM-1093	A	18				Table SPM-3 - The column labeled peaking year for CO2 emissions should really be labelled as a period as it is not a year but a period. (Roger Street, UKCIP-OUCE)	Rejected; the unit is still a year even if the resulting statement covers a range.
SPM-1950	E-SPM-1094	A	18				Table SPM-3 - Is there any indication with the identified period of peaking for CO2 emissions as to when the projected equilibrium SLR above pre-industrial level would be achieved? (Roger Street, UKCIP-OUCE)	This is stated in revised footnote and in extended table caption
SPM-1951	E-SPM-1095	A	18				Table SPM 3. Columns 6 and 7 are relative to pre-industrial times, but the SPM for WG1 and the table SPM1 (this SPM) are relative to 1980-1999. It would help the reader to quote the mean change of temperature and sea-level now observed as a footnote to table SPM-3, so that people can relate these two tables easily. Eg Temperature change since pre-industrial times is 0.76C and ~170mm (for 20Cth runs). (Nathaniel Bindoff, CSIRO MAR and University of Tasmania)	Footnote has been added to Table SPM-1 to explain the offset; revised table caption clarifies that figures in this table are only for long-term changes
SPM-1952	E-SPM-1096	A	18				Should include in the notes (e.g., note 'e') what portion of the projected SLR is due to thermal expansion. (Roger Street, UKCIP-OUCE)	The column is for thermal expansion only, as per table heading
SPM-1953	E-SPM-1097	A	18				Should identify what pre-industrial is in terms of a year. (Roger Street, UKCIP-OUCE)	This is defined in glossary
SPM-1954	E-SPM-1098	A	18				In the table caption it is not clear what "post-TAR" is. (Marco Mazzotti, ETH Zurich)	Caption revised.
SPM-1955	G-SPM-746	A	18				This work is misrepresented here because it totally ignores the importance of the trajectories for aerosols and tropospheric ozone which could greatly change not only the timing, but the effective CO2-eq stabilization. It is clear that with sustainable development, aerosols will be removed and CO2-eq will jump. Similarly the generation of tropospheric ozone from methane and NOx emissions is likely to shift these values. Significantly more caveats need to go into the table notes. (Government of United States)	Rejected; table is based on approved WGI and WGIII material; role of aerosols is included in many stabilisation scenarios and usually assumes reduction in aerosol emissions.
SPM-1956	G-SPM-747	A	18				This table is very useful (Government of Ireland)	Noted thank you
SPM-1957	G-SPM-748	A	18				The relationship between these sea-level rise numbers and those in Table SPM-1 should be made clearer to the reader, if they are to be included. (Government of United States)	Revised text and caption should make this clearer.
SPM-1958	G-SPM-749	A	18				Table SPM-3: This table is very good and highly policy relevant. With respect to the very difficult and crucial political process of comparing the costs of mitigation with the costs of climate change, comparability of Table SPM-3 with Table SPM-2 is of utmost importance!!! Therefore, please provide an additional column with the temperature	Stabilisation warming ranges added to Table SPM-2. Transient warming by 2100 is not available for stabilisation

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							increase until 2100 relative to 1980-1999!!! (Government of Germany)	scenarios.
SPM-1959	G-SPM-750	A	18				Table SPM-3: There should be a note to column 7 that the global average sea level rise expected at equilibrium will not occur for 1000's of years (as opposed to equilibrium warming, which will occur between 2200-2300). (Government of Australia)	Added to footnote on preceding page. Table caption extended to emphasise long-term time scales of projections
SPM-1960	G-SPM-751	A	18				Table SPM-3: Include information on emission reduction relative to 1990, as this is the baseline used in the Kyoto-Protocol and therefore more policyrelevant than the 2000 baseline. (Government of Germany)	Rejected; this information can readily be derived from the information provided in the table.
SPM-1961	G-SPM-752	A	18				Table SPM-3. Would it be possible to introduce a column with the range of global emissions in 2050 associated with stabilisation at the different levels of CO2-equivalent concentrations and temperature increases? Alternatively should the figure SPM-8 made larger and clearer. The mixed use of both CO2 and CO2-equiv in table SPM-3 and figure SPM-8 seems to be confusing. Could this be explained and made more clear? (Government of Norway)	Rejected due to space reasons; we think the information should be clear enough.
SPM-1962	G-SPM-753	A	18				Table SPM-3. The information in this table is very useful, but we think the figure heading should be changed to make the main message more easily accessible, for example as follows: "Long-term global increases in temperature and sea-level after peaking and subsequent stabilisation of greenhousegas concentrations on different post-industrial levels (ref. TAR)." (Government of Norway)	Taken into account in revised Table caption
SPM-1963	G-SPM-754	A	18				Table SPM-3 has very lengthy notes. The same table is presented also as Table 5.1 in Topic 5. Could the notes of SPM-3 be shortened and a reference given to Table 5.1. (Government of Finland)	Rejected; qualifiers and explanations seen as important by many reviewers
SPM-1964	G-SPM-755	A	18				Table SPM-3 and Figure SPM-8 overlap quite a bit. Would it be useful to pick one to reduce the overall length of the document? (Government of United States)	Rejected; they provide important complementary information about emission paths and climate sensitivity uncertainty
SPM-1965	G-SPM-756	A	18				Table SPM-3 - include information on contributions from ice-sheets, as they could be larger than that from thermal expansion (see tiopic 5 page 6 line 11-13) (Government of Germany)	Rejected; this is not possible on the basis of current knowledge at the same level of confidence for different warming levels

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SPM-1966	G-SPM-757	A	18				See comment on Table SPM-1, p. 8 [TSU note: See Comment G-SPM-342-A] (Government of European Community)	Footnote added to give preindustrial temperature offset.in table SPM_1
SPM-1967	G-SPM-758	A	18				Is the value of 375 ppm CO ₂ -equivalent in line 7 less than 455 ppm in line 6 primarily because of the offsetting impacts of anthropogenic particulates? (Government of United States)	yes
SPM-1968	G-SPM-759	A	18				footnote e) to the table SPM-3: An assumption “These values result from a relatively uniform warming throughout the deep ocean which is expected at equilibrium.” sounds a bit unrealistic to be useful for decision-making. In the previous paragraph something should be added about timescale at which the equilibrium will be achieved. Otherwise, the table is misleading for decision-makers and the public. (Government of Russian Federation)	Timescale added in footnote on preceding page; uniform warming assumption is specifically for equilibrium
SPM-1969	G-SPM-760	A	18				Add at the end of note c, “, following a doubling of CO ₂ concentrations” (Government of United States)	rejected; is in glossary
SPM-1970	G-SPM-64	B	18				We have noted already that an additional table could be inserted about this point which relates stabilisation levels to impacts avoided. This could draw on the material presented in section 5.7 of the main SYR report and other impact sections. We believe it is essential to give policymakers some sense of what impacts may be avoided by different levels of mitigation action. Of course this can only be a broad picture in a summary but it goes to the heart of the climate debate and the future action agenda being considered under different UNFCCC work strands. (Government of United Kingdom)	Figure SPM-6 includes stabilisation equilibrium warming ranges to allow this comparison
SPM-1971	G-SPM-65	B	18				Table SPM-3 is useful in linking stabilisation concentrations, temperatures and emission reductions – it would be even more helpful if some link could be made to risks as well. In theory there is a link to the earlier impacts diagram but this is not easily made for the reader. (Government of United Kingdom)	Figure SPM-6 includes stabilisation equilibrium warming ranges to allow this comparison
SPM-1972	G-SPM-66	B	18				P18 Table SPM-3. We have noted that the co-chair of WG3 mentioned in a talk that the requirements on emission reductions to meet stabilisation goals are harder than in the TAR. This is because the climate sensitivity is now somewhat higher. This seems to us a key result and should be reflected in the text. A point also to be reflected in the introduction. (Government of United Kingdom)	Role of climate sensitivity is now included in discussion on decision-making
SPM-1973	G-SPM-67	B	18				Add at end what the additional contribution from ice sheets etc could amount to. (Government of United Kingdom)	Accepted, new paragraph inserted in main text
SPM-1974	G-SPM-43	C	18				Table SPM3: It is good to include the longer term effect on SLR, but thermal expansion alone is not enough, an estimation for ice melt should also be given.	Accepted, new paragraph inserted in main text

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							(Government of Belgium)	
SPM-2145	E-SPM-11	D	18				Table SPM-3. In the 6th and 7th columns, there is no timescale stated over which these changes have occurred, this needs to be explicitly stated. (Stephen Hawkins, Marine Biological Association of the UK)	This is now stated in a footnote on the preceding page and in extended table caption
SPM-1975	E-SPM-1099	A	19	0	19		The fact that "most models use and thus perfect implementation of mitigation measures throughout the 21st century" sounds very crude. How does this influence the results? Shouldn't this be briefly discussed? (Jon Egill Kristjansson, University of Oslo)	Rejected; footnote is already very long and is WGIII SPM approved text
SPM-1976	E-SPM-1101	A	19	1	19	10	Are the stabilization levels really stabilization levels for all scenarios? Since few GCM runs are available which compute e.g. for A1FI anything beyond 2100, I doubt that risks of climate change beyond 2100 for a "stabilization level" of 1130 ppm can be reliably assessed. Was not the assumption that 1130 ppm is reached by 2100 and then artificially kept constant beyond that? If that's the case, Uncertainties for high "stabilization level" scenarios are considerably greater than for low "stabilization level" scenarios. That might need to be expressed in the SYR. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Noted; emission pathways beyond 2100 are not prescribed, so the emission pathways are still consistent with stabilisation. Role of carbon cycle feedbacks for stabilisation is now explicitly discussed in SPM.
SPM-1977	E-SPM-1100	A	19	1	19	20	Comment; As these two particular graphics, are, in my vew at least, amongst the two most critical graphics in the whole report, I feel it is a pity they are so small on the page. On the other hand, I'm not totally sure that putting them one over the other (and therefore re-organising the text in the explication) so that they are larger (and the page is fully used) would be any better. However, I also think that turning the existing presentation into landscape (to gain size on the graphics) would also risk losing their effect. Perhaps the team could visually review a presentation of the three options and decide which does the job best? (Pat Finnegan, Grian)	Considered options for improvements.
SPM-1978	G-SPM-761	A	19	1			The term "historical emissions" can be deleted from the first graph. (Government of Norway)	Rejected – this appears to be useful information.
SPM-1979	E-SPM-1102	A	19	2	19	2	change 'SPM-8' to 'SPM-7' (Suam Kim, Pukyong National University)	Editorial
SPM-1980	G-SPM-762	A	19	2	19	10	An explanation of Post-SRES scenarios should be added here. (Government of Japan)	Rejected due to lack of space; scenarios are discussed in section 3 of SPM, with additional detai in longer report.
SPM-1981	G-SPM-763	A	19	7	19	7	We propose that the text does not refer to colors in the figure. This is in order to facilitate the reading for those printing without colors. The lines could for instance be named "upper broken line" or "upper dashed line".	Noted, but colour helps convey information for electronic version. We believe the figure

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							(Government of Norway)	and caption are intelligible in black and white as it is.
SPM-1982	G-SPM-764	A	19	8	19	8	We propose that the text does not refer to colors in the figure. This is in order to facilitate the reading for those printing without colors. The lines could for instance be named "lower broken line" or "lower dashed line". (Government of Norway)	Noted, but colour helps convey information for electronic version. We believe the figure and caption are intelligible in black and white as it is.
SPM-1983	E-SPM-1103	A	19	9	19	9	"Emission ranges..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	editorial
SPM-1984	E-SPM-1104	A	19	13	19	14	What is the point of this statement? In a summary which such limited space, is this really such an important point that it should be highlighted here? What does something like this mean to policy makers? The paragraph talks about the cost of stabilization at certain points, but then doesn't refer to what benefits you get for stabilizing at that level. (Katherine Casey Delhotal, RTI International)	Taken into account and statement shortened; however, it makes an important fundamental point.
SPM-1985	E-SPM-1106	A	19	13	19	14	I am also curious about the economic analysis - does the cost of stabilization reflect a policy implemented today or at some point in the future. I think it would be a good idea to show (if possible) that waiting to implement policies can make stabilization more expensive. (Katherine Casey Delhotal, RTI International)	Insufficient analysis in underlying report to provide specific information.
SPM-1986	G-SPM-767	A	19	13	19	14	Change 'from' to 'for' to improve clarity of this sentence. (Government of Canada)	Relevant text deleted.
SPM-1987	G-SPM-768	A	19	13	19	14	"and is relatively higher from baseline scenarios with high emissions" should be clarified because the costs for baseline scenarios are zero. (Government of Japan)	Text deleted
SPM-1988	G-SPM-765	A	19	13	19	15	We propose to delete this sentence, which looks quite evident. At least, it should not be in bold characters. (Government of France)	second part of the sentence deleted.
SPM-1989	G-SPM-766	A	19	13	19	15	Suggest rewording to make this clearer: "The macroeconomic cost of mitigation generally rises as the stringency of the stabilization target, and it is relatively higher when derived from baseline scenarios characterized by high emission levels. {5.5}" (Government of United States)	second part of the sentence deleted to help with clarity of message.
SPM-1990	E-SPM-1105	A	19	13	19	20	the whole issue on mitigation costs is not clear for a non expert reader. It is also difficult to read in section 5.5 (Monica Beatriz Wehbe, National University Rio Cuarto)	Wording revised to clarify

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SPM-1991	G-SPM-68	B	19	13	19	20	Page 19 line 13-20 - worth putting in somewhere in the text the general finding that the costs of mitigation for stabilisation around 550ppm (or something similar/appropriate) are around or below 1% GDP by 2050, as policymakers may find the tables difficult to interpret. (Government of United Kingdom)	Taken into account; revised text gives change in GDP growth rates.
SPM-1992	E-SPM-1107	A	19	13			"macroeconomic cost" should be compared directly with "macro-economic benefits" of avoided costs. However the low confidence, high uncertainty and multiple assumption levels of each of these should be identified. (Joe Ravetz, University of Manchester)	Accepted; comparison is made in later section of SPM
SPM-1993	E-SPM-1108	A	19	14	19	14	"...is relatively higher for baseline scenarios ..." Here again there is a comparison with only one element cited. Higher than what? (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	text deleted
SPM-1994	G-SPM-769	A	19	14	19	14	Add a second sentence in bold : "The average reduction of annual GDP growth rates (percentage points) ranges from less than 0.06 for stabilisation at 600-700 ppm CO ₂ -eq to less than 0.1 for stabilisation at 535-590 ppm CO ₂ -eq." or the sentence taken from topic 5, page 9, lines 6 to 8 : "There is high agreement and medium evidence that in 2050 global average macroeconomic costs for multi-gas mitigation towards stabilisation between 710 and 445 ppm CO ₂ -eq, are between a 1% gain to a 5.5% decrease of global GDP" (Government of France)	Accepted (first suggestion)
SPM-1995	G-SPM-44	C	19	14	19	14	Replace '...higher from...' by 'higher for...'. (Government of Belgium)	text deleted
SPM-1996	E-SPM-1109	A	19	14			"relatively higher from baseline scenarios with high emissions" is a bit confusing. Is "higher for baseline scenarios with higher emissions" what is intended? (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	text deleted
SPM-1997	E-SPM-1110	A	19	17	19	17	There are significant issues with what macro economic costs include and how they are defined. Footnote 4 does indicates some of the limitations of the estimation but I think that costs deserve a more in depth explanation including issues related to the differences between financial costs, technological costs, resource costs, consumers' surplus, producers' surplus, private costs, etc. (John Nyboer, Simon Fraser University)	too much detail for SPM
SPM-1998	G-SPM-770	A	19	17	19	17	We propose to write: ".....the estimated cost of multi-gas mitigation....." (Government of Norway)	wording deleted as not essential
SPM-1999	G-SPM-771	A	19	17	19	17	In Footnote 4, please define "induced technological change" for a general audience. (Government of United States)	defined in glossary

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SPM-2000	G-SPM-772	A	19	17	19	17	In Footnote 4, it is suggested to add a sentence "As these assumptions are unrealistic, these cost estimates are in general an underestimate." after "the 21st century". (Government of China)	Rejected; any model assumption makes idealised assumptions; exclusion of induced technological change, co-benefits and use of tax revenues shifts outcomes the other way.
SPM-2001	E-SPM-1111	A	19	17	19	20	I am missing here the emphasis for the point on not having included negative costs from co-benefits. This is only stated in the footnote, which is easier to overlook than ordinary text. I suggest to "promote" that statement from the footnote to the ordinary text. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected due to space reasons
SPM-2002	E-SPM-1112	A	19	18	19	18	It would add more information to insert from WGIII, SPM para 20: "In 205041 global average macro-economic costs for multi-gas mitigation towards stabilization between 710 and 445 ppm CO2-eq, are between a 1% gain to a 5.5% decrease of global GDP." (Harald Winkler, Energy Research Centre, University of Cape Town)	Rejected due to space reasons; this information is found in the table
SPM-2003	G-SPM-773	A	19	20	19	20	The authors should consider including in the text a reference to the very small reduction of annual average GDP growth rates in Table SPM-4, i.e. 0.06-0.12% by 2030 and 0.05-0.12 by 2050. As this may be more relevant than the raw GDP reductions. (Government of Australia)	Accepted
SPM-2004	G-SPM-774	A	19		19		Figure SPM-8: This is a great improvement over what was presented in the SPM of WGIII. We congratulate the authors on making this much easier to understand. However, a y-axis in Gt CO2eq would be preferable to allow direct comparison with Table SPM-3. (Government of Canada)	Accepted
SPM-2005	E-SPM-1113	A	19				note 4 at foot of page: could be written more clearly. Cost is the same, what varies is how it is paid. (Stephan Halloy, Conservation International)	Rejected, text is from WGIII SPM.
SPM-2006	E-SPM-1114	A	19				Do colours overlap in left panel of figure SPM-8. Legend is really small... (Michel Rixen, NATO Undersea Research Center)	Figure revised to make it more readable
SPM-2007	G-SPM-775	A	19				Figure SPM-8: a type of emissions should be specified (industrial, land use, total). (Government of Russian Federation)	Clarified in figure caption.
SPM-2008	G-SPM-776	A	19				Figure SPM-8 presents rather wide colored bands at the right-hand panel. Their width characterizes uncertainty in existing knowledge about equilibrium climate sensitivity. However, this is an internal problem of research community, namely new models and processes increase uncertainty, unfortunately, instead of decreasing it. This determines a certain crisis of the risk assessment framework (researchers rely on margins of	Rejected; uncertainty is very important to support decision-making.

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							probability distribution functions, i.e. on things about which they actually know very little). Therefore, we would suggest to use only the median curve in this figure and eliminate the bands. (Government of Russian Federation)	
SPM-2009	G-SPM-777	A	19				Figure SPM-8 comment: The left-hand panel does not add significant new information to that in Table SPM-3, is confusing, and should be omitted. (It is retained, the Table SPM-3 should be omitted.) This will also mean a number of lines can be removed from the caption. The right-hand panel of the figure should be retained. (Government of New Zealand)	Rejected; it shows important additional information about trajectories of emissions.
SPM-2010	G-SPM-778	A	19				Fig SPM-8. The figure should have a title. (Government of Norway)	Accepted, added.
SPM-2011	G-SPM-69	B	19				Footnote 4 - This footnote should acknowledge that there are also some models - especially those that have induced technological change - that not only reduce costs but also suggest there are net benefits from mitigation, even at stringent stabilisation levels. It may be useful to make this footnote into actual text. (Government of United Kingdom)	Rejected; wording of footnote is from approved WGIII SPM; co-benefits are mentioned in this footnote.
SPM-2012	E-SPM-1116	A	20	1	20	11	Again the text surrounding this table SPM-4 should redundantly (see my previous comment) be stated here that co-benefits and other negative costs were not considered in these cost assessments. I suggest to a footnote e) after word "costs" in the caption of the Table SPM-4. This should give this point the prominence it deserves IMHO. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Rejected – it is redundant - co-benefits are already referred to in footnote.
SPM-2013	E-SPM-1115	A	20	1			It is imperative that IPCC point out that these are net estimates, with the costs being very likely greater than this in the beginning - we need to be totally honest about this to policymakers. (Tom Crowley, Duke University)	Rejected – assessment is made for a specific year (2030 and 2050), not for transient costs – no basis for this assertion. Revised headline acknowledges that costs could vary for countries and sectors.
SPM-2014	G-SPM-779	A	20	2	20	2	Please add: "The overall global GDP growth in the baselines is much higher the mitigation costs. The SRES-A1-Scenario Family assumes an average annual growth rate of global GDP of 3.6% per year between 1990 and 2030, which is in line with recent observations. With this annual growth rate, the GDP in 2030 would be 242% of the GDP in the year 2005. A reduction of 3% would result in a GDP of 235% of the GDP in 2005. This means a delay in growth by xx months." (Government of Germany)	Rejected – too much detail for SPM – text added that gives the GDP reduction in terms of reduced growth rate.

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SPM-2015	G-SPM-780	A	20	10	20	11	Full stop after "The number of studies that report GDP figures is relatively small." Delete: "and they generally use low baselines. High emissions baselines generally lead to higher costs." Reason: In the underlying Chapter 3 of WGIII, Fig 3.20 shows that the baselines are NOT generally low, but similar to other studies. The scatter is too broad for such a statement. (Government of Germany)	Rejected; see detailed discussion in chapter 3; wording is approved WGIII SPM text.
SPM-2016	E-SPM-1119	A	20	14	20	16	Is this statement true? Can all of the "stabilization levels assessed", including Category I, Table 5.1, be achieved using current and soon-to-be available technologies? This seems somewhat optimistic. The authors may want to consider a re-wording to indicate something like: "stabilisation of atmospheric CO2 at levels of ___ can be achieved by...". In other words, specifying a stabilization level, rather than "a range of stabilization levels" may make this statement more definitive and clear. (Henry Janzen, Agriculture and Agri-Food Canada)	Rejected – this is consistent with the WGIII assessment; note wording says “commercialised in coming decades” and also refers to barriers and incentives as caveats. Approved WGIII SPM wording,
SPM-2017	E-SPM-1117	A	20	14	20	18	Propose to supplement the statement on availability of technologies for achieving stabilisation levels with assessment of prospects for distribution these technologies among the countries with the greatest greenhouse gas emissions. (Michael Gytarsky, Institute of Global Climate and Ecology)	Too much detail for SPM.
SPM-2018	E-SPM-1120	A	20	14	20	18	As far as it is not clear how general the currently available technologies are, this statement is misleading so that the on-going technology development would be good enough for mitigation. (Motoyoshi Ikeda, Hokkaido University)	Rejected – wording makes clear reference to need to address barriers and provide incentives.
SPM-2019	E-SPM-1118	A	20	14	21	11	It seems more reasonable to me to bring this section before the statement on cost - first state what can be done, then what the cost would be. (Tom Crowley, Duke University)	Accepted.
SPM-2020	E-SPM-1121	A	20	15	20	15	Add the word MITIGATION before portfolio of technologies (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Rejected – context makes it clear we are talking about mitigation.
SPM-2021	G-SPM-70	B	20	16			There appear to be issues around timescale for reductions and also for deployment of technology – please clarify what 'coming decades' means. (Government of United Kingdom)	'coming decades' appears to be plain English with no need for further elaboration; is approved WGIII SPM wording.
SPM-2022	E-SPM-1122	A	20	18	20	18	This assumes that appropriate and effective incentives are in place for development, acquisition, deployment, transfer and diffusion of technologies and for addressing related barriers. (Bangzhong Wang, China Meterological Administration)	Shortened version of this text used for space reasons.
SPM-2023	G-SPM-71	B	20	19			Key conclusion from underlying report (Topic 4) is missing here and should be inserted: "carbon prices rising to 20 to 80 US\$/tCO2-eq by 2030 and 30 to 155 US\$/tCO2-eq by 2050 are consistent with stabilisation at around 550 ppm CO2-eq by 2100."	Carbon prices have now been discussed more extensively in earlier part of revised SPM.

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							(Government of United Kingdom)	
SPM-2024	E-SPM-1125	A	20	20	20	20	A major gap in the SYN is any discussion of the carbon prices associated with the mitigation potentials. These prices are crucial in the response of a market economy. The potentials will only be realized if the price signal is "long, loud and legal" to quote Stern. This is a strong message from the WG3 Report and the underlying literature. Although there is a temptation to assert that governments can regulate and mandate mitigation, there is no convincing evidence that this will work without an associated carbon price. All the top-down models require carbon prices, and the substantial mitigation options from the bottom-up studies also require carbon prices. This position in the SPM seems to be one of the better places to add a new paragraph. My suggested text is drawn (with edits) from chapter 11, p. 61: "Diverse strands of evidence suggest with high confidence that real or implicit carbon prices of 20-50 US\$/tCO ₂ -eq, reached globally within the period 2020-2030 and sustained or increased thereafter, would deliver deep emission reductions by mid Century consistent with stabilisation around 550 ppmv CO ₂ -eq by 2100. More stringent targets would require higher prices." See 11.7 WG3 Report. The evidence is not just the top-down modelling studies of chapter 3 WG3, but also (1) the synthesis of chapters 4 to 10 given in 11.4, (2) the integrated IEA 2007 studies to 2050 and (3) literature covering the carbon price range at which CCS will become economic. (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	Carbon prices have now been discussed more extensively in earlier part of revised SPM.
SPM-2025	E-SPM-1123	A	20	20	20	22	In bold (Annick Douguédroit, Université de Provence)	Text deleted for space reasons; point has already been made earlier.
SPM-2026	G-SPM-781	A	20	20	20	22	Isn't more efficient RD&D efforts required in any scenario? Suggest to replace by: "the greater the need for development of and investment in low-greenhouse gas emission technologies ..." (Government of European Community)	Text deleted for space reasons.
SPM-2027	E-SPM-1124	A	20	20			Change "especially those of 550ppm CO ₂ -eq or lower" to "especially below 550ppm CO ₂ -eq" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text deleted for space reasons.
SPM-2028	E-SPM-1126	A	20	21	20	21	Need to clarify what is meant by more efficient RD&D. (Roger Street, UKCIP-OUCE)	Text deleted for space reasons
SPM-2029	E-SPM-1127	A	20	21	20	21	Avoid jargon such as RD&D, write it out. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Text deleted for space reasons
SPM-2030	G-SPM-783	A	20	24	20	24	Insert the word "potential" between "The" and "contribution". (Government of United States)	Text deleted for space reasons
SPM-2031	G-SPM-784	A	20	24	20	26	Consistent with WG3 SPM, paragraph 19 (p. 25), change "individual" to "different" in both lines.	Text deleted for space reasons

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							(Government of United States)	
SPM-2032	G-SPM-782	A	20	24	20	31	Renewable, particularly bioenergy could be mentioned, since in the long-term renewable energy seems to dominate the mitigation potential (Government of India)	Text deleted for space reasons
SPM-2033	E-SPM-7	B	20	24	20	31	Why the report did not touch upon the possibility (with uncertainty) of the non-CO2 GHG mitigation options? (Shunsuke Mori, Tokyo University of Science)	Space limitations
SPM-2034	E-SPM-1128	A	20	25	20	25	change 'SPM-9' to 'SPM-8' (Suam Kim, Pukyong National University)	editorial
SPM-2035	G-SPM-785	A	20	25	20	25	Delete "the analyzed" as it is unnecessary. (Government of United States)	Text deleted for space reasons
SPM-2036	E-SPM-1129	A	20	27	20	27	Change "energy sector" to "energy production and use". The term energy sector usually applies to the production of energy. A significant part of the 60-80% reduction referred to in this text comes from energy conservation and efficiency in end-use sectors such as industry, buildings and transport. (Robert Siveter, IPIECA)	Taken into account – "energy supply and use"
SPM-2037	G-SPM-786	A	20	27	20	27	It is suggested to change "energy sector" to "energy activities". Avoidance of confusion as energy sector is often considered as energy supply sector. Here it also includes energy consumption sectors, such as transports and buildings. (Government of China)	Taken into account – "energy supply and use"
SPM-2038	G-SPM-787	A	20	27	20	27	Change "energy sector" to "energy production and use". The term energy sector usually applies to the production of energy. A significant part of the 60-80% reduction referred to in this text comes from energy conservation and efficiency in end-use sectors such as industry, buildings, and transport. (Government of United States)	Taken into account – "energy supply and use"
SPM-2039	G-SPM-45	C	20	27	20	27	The wording "energy sector" should be explained very clearly or substituted by something more clear, to avoid any possible confusion with "energy supply sector" (Government of Belgium)	Taken into account – "energy supply and use"
SPM-2040	E-SPM-1130	A	20	27	20	28	Change "emissions reductions are estimated to come from the energy sector (60-80% of total energy reductions)" to "emissions reductions (60-80% of total) are estimated to come from the energy sector" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text revised

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SPM-2041	E-SPM-1132	A	20	28	20	28	I suggest to add: , in particular, energy efficiency "(Figure SPM-6)." (Jacques Rilling , CSTB)	Rejected – Figure SPM-6 makes no specific reference to energy efficiency
SPM-2042	E-SPM-1133	A	20	28	20	28	Add 'followed by renewables' after 'energy efficiency' as Figure SPM-9 show these to be the second most effective reduction measure. (John R. Porter, University of Copenhagen)	Rejected – space limitations mean we can give the key point only; other options are of similar magnitude especially by 2100.
SPM-2043	E-SPM-1131	A	20	28	20	30	The sentence should be read as follows: " For lower stabilisation levels, scenarios put more emphasis on the use of low carbon energy sources, such as renewable energy, and the use of CO2 capture and storage." This is a very clear example showing that the SDM does not take into account "renewable energy" references present in the WGIII report and in the different topics' texts (e.g. Topic 5, page 10, line 21). (Christian Kjaer, European Wind Energy Association (EWEA))	Specific energy supply options deleted for space reasons.
SPM-2044	G-SPM-72	B	20	29	10	30	There may be a way of phrasing this sentence to avoid the implication that for higher stabilisation levels CCS is not needed at all. The tables presented imply CCS is needed in all scenarios. (Government of United Kingdom)	Specific energy supply options deleted for space reasons.
SPM-2045	G-SPM-788	A	20	29	20	29	Insert between the words "sources" and "and" the phrase ", such as renewable energy and nuclear power,". (Government of United States)	Specific energy supply options deleted for space reasons.
SPM-2046	E-SPM-1134	A	20	29	20	30	Add an example, "such as renewable energy and nuclear power", which is shown in the Topic 5, p.10, line 20 to 21. in the sentence for clarity. The new sentence now reads, ".. put more emphasis on the use of low carbon energy sources, such as renewable energy and nuclear power, and the use of CO2..". (Shinichi Nakakuki, Tokyo Electric Power Company)	Specific energy supply options deleted for space reasons.
SPM-2047	G-SPM-789	A	20	29	20	30	Add an example, "such as renewable energy and nuclear power", which is shown in the Topic 5, p.10, line 20 to 21. in the sentence for clarity. The new sentence now reads, ".. put more emphasis on the use of low carbon energy sources, such as renewable energy and nuclear power, and the use of CO2..". (Government of Japan)	Specific energy supply options deleted for space reasons.
SPM-2048	E-SPM-1135	A	20				Table SPM-4: In the columns for 'Median GDP reduction' values are all positive, in the column with the 'range of GDP reduction' some values are negative - meaning an increase in GDP. Is this what you mean? Remove the footnotes as too technical and refer to the relevant WG report instead. (John R. Porter, University of Copenhagen)	Yes, negative values mean increase in GDP. Footnotes are important to avoid misinterpretation of the table.

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SPM-2049	E-SPM-1136	A	20				Table SPM-4: Column « Range of GDP reduction »: line 590-710: -0.6-1.2 and -1-2. -0.6 and -1 supposes an increase of the GDP. It means that the GDP could be between a 0.6 increase and a 1.2 decrease in percentage. The increase is too complicated to be quickly understood. (Annick Douguédroit, Université de Provence)	Space limitations prevent more detailed explanation
SPM-2050	E-SPM-1137	A	20				Table SPM-4: Are any benefits such as lower death rates from air pollution included in these calculations, or are these strictly the costs only? (Toufiq Siddiqi, Global Environment and Energy in the 21st Century)	See footnote – co-benefits are generally not included.
SPM-2051	E-SPM-1138	A	20				Table SPM-4. The the relative weight of outlier scenarios compared to median, and state type of nations, and reasons for larger economic impacts where this might apply. Also, it seems inconceivable to me that the reduction of average annual GDP growth (right hand column) is virtually the same in the mid-range and extreme scenarios, especially since there is a marked difference in the range of GDP reductions (center columns). These smaller differences need an explanation. (Tom Crowley, Duke University)	Too much detail for SPM; change in rate of growth for different scenarios is consistent with range of GDP reductions.
SPM-2052	E-SPM-1139	A	20				Table SPM-4 is unsatisfactory. "Slightly negative" should be replaced by a suitably rounded number, consistent with the numerical accuracy of other values in the table, ie either 0, -0.1 or whatever the number is. Also, footnote b) states that entries show the median and the 10th and 90th percentile ranges, whereas only ranges are shown, and some (e.g. <5.5) do not relate to two percentile limits. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Rejected – approved notion from WGIII SPM. Median and confidence intervals are not available for lowest scenarios as explained in table footnote.
SPM-2053	E-SPM-1140	A	20				Table 4: for a summary requires more clarity. Is the % expressed per year or over the 20 year period? It may be clearer to uses the word 'to' instead of dashes between numbers, as these create confusion with minus sign (Stephan Halloy, Conservation International)	Wording added to clarify.
SPM-2054	E-SPM-1141	A	20				A general question: Should this SPM make reference to and compare conclusions with the Stern Report when dealing with the economics of climate change ie. Table SPM-4? (John R. Porter, University of Copenhagen)	Stern report came very late in IPCC assessment; to extent possible, it has been included in the WG reports. It would not be appropriate in the SYR SPM to make a specific comparison with an individual study.
SPM-2055	E-SPM-1142	A	20				(Table SPM-4) It took me a while to understand that 'stabilisation levels' were actually target levels to be achieved (Michel Rixen, NATO Undersea Research Center)	Noted
SPM-2056	G-SPM-790	A	20				table SPM-4: Use of this table is very problematic. If GDP losses vary substantially across regions and countries, those countries having severe losses have no chances to get any compensation from others – “winners” (having low losses), because no	Noted – but this is a political problem not a problem with the findings reported here.

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							respective international mechanism for such compensation exist or proposed. (Government of Russian Federation)	
SPM-2057	G-SPM-791	A	20				Table SPM-4: Add information on the GDP growth in the baseline, otherwise, figures on GDP reduction can be misleading for policymakers. (Government of Germany)	Relevant wording added to text.
SPM-2058	G-SPM-792	A	20				table SPM-4: A reference to the Figure SPM-8 (left-hand panel) is needed to explain what kind of stabilization scenarios are considered in the table. (Government of Russian Federation)	This should be obvious from the context of this material.
SPM-2059	G-SPM-793	A	20				Table SPM-4 should be critical to policymakers. It summarizes the costs of mitigation in the first half of the century. It should be presented in a way that is crystal clear. While the U.S. Government understands that the following details cannot be addressed in a synthesis, they are raised as food for thought for improvement of the table. Are the costs all discounted? If so, at what rate? How is the reduction of average annual GDP growth rate calculated? Is it the integral of the discounted cost of mitigation over the period divided by the integral of the global GDP over the same period? If this is the case, then how are the cost numbers for a given year calculated? For example, in the row for the range 535-590 ppm(V) the median GDP reduction is 0.6 for 2030 and 1.3 for 2050. Do these numbers mean the median GDP reductions for each of these years? If so they seem very out of line with the last column indicating that the reduction of average annual GDP is < 0.1% over the period from 2005 to 2030 and from 2005 to 2050. How these numbers derive needs to be more carefully explained so that the reader is not left confused. Finally, the role of advanced technologies needs to be addressed. For example, in the paper by Jae Edmonds and Steve Smith called the Technologies of Two Degrees published in the Proceedings of the Exeter, England Conference in 2006, a cost of mitigation using existing technologies is estimated to be about \$18 Trillion where the cost is discounted at 5% per year. The integrated GDP (not discounted) was assumed to be about \$10,000 Trillion over the period in question of 1990 to 2095. Hence, the cost is 0.18% of GDP on average. In the last column of Table SPM-4 the cost for the last row indicates that average annual reduction of GDP should be <0.1%. Edmonds and Smith's number should correspond to this last row, but their number is twice as large. Of course the period they calculated was 105 years instead of 45 years but since everything is discounted it is reasonable to assume the average cost per year should be larger for the first 45 years. Further Edmonds and Smith indicate that the cost can be reduced by a factor of about 5 by assuming the development of advanced technologies of various kinds. This indicates the importance of R&D to bring down the cost of mitigation. The discussion of Table SPM-4 does acknowledge the importance of R&D but no quantitative estimates or the potential are given.	Noted; however, discussion is far too detailed for SPM; see WGIII Chapter 3 for details. GDP reduction in 2030/2050 is the GDP reduction in this year compared to the baseline case. Models do not predict GDP variations in individual years before 2030/2050.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of United States)	
SPM-2060	G-SPM-794	A	20				Table SPM-4 comment: Columns 4 and 5 (range of GDP reduction) are not clear. The range needs to be indicated by the word 'to' not by a dash, thus: " -0.6 to 1.2 " OR " -0.6 to +1.2 " , to avoid confusion with the 'minus' sign. Also, it is not clear what a minus sign represents. It would be better to re-label the columns "Range of GDP change (%)" and adjust the signs accordingly. (Government of New Zealand)	Replaced '-' with 'to'. Wording referring to 'GDP reduction' kept because most studies show GDP losses.
SPM-2061	G-SPM-795	A	20				Add "Negative values indicate GDP gain." to note b. (Government of United States)	accepted.
SPM-2062	G-SPM-73	B	20				Table SPM-4 (445 – 535ppm CO ₂ e) – it would be very helpful if we could give some indication of the lower bound on the ranges for the GDP reduction. For example, it is not clear if it is even zero, negative, small positive or large positive. (Government of United Kingdom)	Rejected; this information is not in approved WGIII SPM version of this table.
SPM-2063	G-SPM-46	C	20				A plot of mitigation costs from different models as a function of CO ₂ , similar to Figure 3.25 from WG3 could be shown to complement table SPM4. Figure 3.25 also illustrates that "information not available" in SPM4 is not true, and that showing only the maximum costs in the bottom row of this table is rather misleading. (Government of Belgium)	Rejected due to space limitations in longer report. Figure 3.25 does not show medians.
SPM-2064	E-SPM-1143	A	21	1	21	11	This is almost impossible to understand. From a policymaker's point of view the model intercomparison is beside the point and confusing. I suspect that almost no policymaker would understand that comparisons of sources of emissions reductions would be valid only for individual models. They would want to pick conservation from IMAGE, fuel switch from MESSAGE and renewables from IPAC, for example. Furthermore, the baseline is only poorly described in the final line of the caption, it should be made clear that it is a TOTAL of 6000 to 7000 GtCO ₂ during the period 2000-2100. It is also misleading to describe the x axes as "cumulative reductions", they are total reductions for the period stated. (Archie McCulloch, University of Bristol)	Figure deleted.
SPM-2065	G-SPM-796	A	21	1	21	11	We suggest that Figure SPM-9 is deleted and described in writing in stead of a figure since the present figure is not easy to understand and raise a lot of questions (although the explanatory text on page 20 helps!). IPAC has a much higher total reduction at low levels for 2000-2030 than the others. How can AIM have zero renewable at intermediate level stabilisation? Can the baseline emissions for 2000-2030 also be shown in the caption? It may help the reader to indicate what percentage of baseline emissions that are avoided in the different models. Page 20, line 27, mentions the "energy sector". Should it be clarified that this refers to energy supply AND energy end-use in different sectors (so that the distinction is clear visas "energy supply" sector in Figure SPM-6)?	Figure deleted.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Government of Sweden)	
SPM-2066	G-SPM-797	A	21	1	21	11	there is a contradiction in the figure; in the heading the term "emission reduction" is used, in the agenda the term "forest sink" is used. In the heading the words "and enhancement of removals" should be added. The term "forest sinks" in the agenda might be the right one depending what was calculated: the enhancement of removals or the reduction of emissions from deforestation as well. if the former is right "forest sinks" is the right term. if the latter is right the term "forest measures" could be used. The same should be checked for the explanatory part of the figure (line 8). The term "forest measures" seems to be more appropriate than "forest sink enhancement". (Government of Germany)	Figure deleted.
SPM-2067	E-SPM-1144	A	21	1			the key role and implications for specific sectors and technologies should be identified: e.g. Aviation emissions being the fastest growing emissions source, with no substitute technologies being currently viable. (Joe Ravetz, University of Manchester)	Figure deleted.
SPM-2068	E-SPM-1145	A	21	1			Four different models, each with different foundations will make it difficult for policymakers to make informed decisions or is that the idea to demonstrate uncertainty. If not some confidence levels on each of the models should be provided. (Robert Molinari, University of Miami)	Figure deleted.
SPM-2069	E-SPM-1146	A	21	2	21	2	I think you should elaborate on what "fossil fuel switch" means - the others are self explanatory, but this one isnt (Keith Shine, University of Reading)	Figure deleted.
SPM-2070	E-SPM-1147	A	21	3	21	3	change 'SPM-9' to 'SPM-8' (Suam Kim, Pukyong National University)	Figure deleted.
SPM-2071	E-SPM-1149	A	21	9	21	9	For consistency purposes (e.g., with the IPCC SRCCS), statement should read "CCS includes carbon dioxide capture....." (or "CO2 capture") as opposed to "....carbon capture...." (Veronica Brieno Rankin, GeoSeq International LLC)	Figure deleted.
SPM-2072	G-SPM-798	A	21	9	21	9	Caption of Figure SPM-9: Clarification necessary for non-experts, after "...these options in the baseline." Insert: "For example, all models show a large share of renewable energies already in the baseline. Therefore, their additional mitigation potential shown here is smaller than their total contribution to emission reductions." (Government of Germany)	Figure deleted.
SPM-2073	E-SPM-1148	A	21	9	21	10	If "CCS includes carbon capture and storage from biomass." is true, what is the difference between "CCS" and "forest sinks"? (Toshihiko Masui, National Institute for Environmental Studies)	Figure deleted.

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SPM-2074	E-SPM-1150	A	21	10	21	11	The sentence "Mitigation from" seems to be missing something, e.g., a verb. (Jon Egill Kristjansson, University of Oslo)	Figure deleted.
SPM-2075	E-SPM-1151	A	21	10	21	11	Base line scenarios in 4 models are the same? (Toshihiko Masui, National Institute for Environmental Studies)	Figure deleted.
SPM-2076	G-SPM-799	A	21	10	21	11	The sentence ' Mitigation from baseline scenarios with intermediate emmissions between 6000 to 7000 Gt CO2 (2000-2100)' needs restructuring (No verb). (Government of Pakistan)	Figure deleted.
SPM-2077	E-SPM-1152	A	21	11	21	11	"is" is missing after "emissions" (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	Figure deleted.
SPM-2078	G-SPM-800	A	21	12	21	12	Insert Figure from the underlying Chapter 3 of WG III, i.e. Figure 3.24. Reason: On Page 20, Lines 26-28 of this SYR-SPM, the importance of the energy sector is stressed. Therefore, policy makers need to see how different models address this importance of the energy mix. Figure 3.24 of WGIII is an excellent illustration. (Government of Germany)	Rejected; not contained in longer report due to space limitations.
SPM-2079	G-SPM-805	A	21	14	21	15	"It is very likely that anthropogenic climate change will result in net damage costs into the future" is an ambiguous phrase. "Net" implies that there are also some gains. Does this take into account, for example, oil gains? (Government of Russian Federation)	Net only implies that costs have been averaged. Costs refer to impacts of climate change only.
SPM-2080	G-SPM-801	A	21	14	21	16	There is an inconsistency in the reporting of this finding across the WG2 SPM, the body of the SYR and the SYR SPM. In terms of the costs assessed they are respectively reported as "net annual", "net economic" and "net damage". The authors need to settle upon a consistent construction. (Government of Australia)	Wording revised to be consistent.
SPM-2081	G-SPM-802	A	21	14	21	16	The term "can impede" should be changed to "will impede", in order to be consistent with the WG II TS 5.4. (Government of European Community)	Taken into account; using "could" which is more consistent with WGII SPM wording
SPM-2082	G-SPM-74	B	21	14	21	16	This sentence could replace what is currently on page 17 line 1-4. (Government of United Kingdom)	Rejected; reasons for concern look at changes compared to TAR; SCC was not available at time of TAR
SPM-2083	E-SPM-1153	A	21	14	21	18	This is still something of an obvious motherhood statement, but it is also a good one for closure. (Tom Crowley, Duke University)	Structure revised with new closing statement

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SPM-2084	G-SPM-803	A	21	14		14	Should the phrase "very likely" be italicized to indicate that it should be associated with a probability of >90% certainty? (Government of United States)	Yes
SPM-2085	E-SPM-1154	A	21	14			Delete the word "anthropogenic" since regardless of its causes, climate change is expected to result in the mentioned "net damage costs". (Mustafa Babiker, Saudi Aramco)	accepted
SPM-2086	E-SPM-1155	A	21	14			"development more sustainable" - at present this end paragraph is quite vague and needs more policy relevance. Even at the level of the SPM some key themes should be identified: e.g. 1) Mitigation and sustainable development: incentives via trade agreements: role of public awareness and behaviour change: carbon & other eco-systems: role of planned urbanization for low-impact infrastructure: inter-dependency of developed / non-developed nations. 2) Adaptation/ vulnerability and sustainable development: adaptive capacity building via strengthening civil society: tempering power of multi-nationals and international financial flows: endogenous economic development through ethical trade: multi-cultural and multi-ethnic policies in conflict mediation: inter-dependency of developed / non-developed nations. (Joe Ravetz, University of Manchester)	Section restructured; too much detail for SPM
SPM-2087	G-SPM-804	A	21	14			delete the word "anthropogenic" since regardless of its cause, climate change is expected to result in the mentioned "net damage costs". (Government of Kingdom of Saudi Arabia)	accepted.
SPM-2088	E-SPM-1156	A	21	15			Delete "can" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Taken into account; using "could" which is more consistent with WGII SPM wording
SPM-2089	G-SPM-76	B	21	16	21	17	This sentence should clarify that there is confidence for human vulnerability to be reduced but not for natural vulnerability. (Government of United Kingdom)	Rejected; resilience of natural ecosystems can be increased, too, especially where they intersect with human systems
SPM-2090	G-SPM-806	A	21	16	21	18	Effective mitigation can reduce climate change itself, but not vulnerability to climate change. Hence, the phrase "by promoting effective mitigation and adaptation" could be deleted. (Government of European Community)	wording revised to avoid misunderstanding
SPM-2091	E-SPM-1157	A	21	16	21	23	Some positive example on high agreement/much evidence assertion that sustainable development can significantly reduce climate vulnerability would strong underscore this crucial statement. (Peter Liotta, Pell Center for International Relations and Public Policy)	Too much detail for SPM
SPM-2092	G-SPM-75	B	21	16	21	31	This subsection seems to repeat a lot of detail that is currently on page 12 line 8-15, and Page 15 line 37 - Page 16 line 7. It would be worth considering merging these three subsections	SPM restructured and these sections have been merged

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							into one on sustainable development, adaptation and mitigation. (Government of United Kingdom)	
SPM-2093	E-SPM-1159	A	21	17	21	17	Add: ".....reduce vulnerability AND RISE PREPAREDNESS to THE climate change...." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	rejected – this is implied
SPM-2094	E-SPM-1158	A	21	17	21	21	Would help to define what is meant by more sustainable development. Not clear if that what is being attempted in lines 21-22 (Roger Street, UKCIP-OUCE)	rejected – seems to be a useful general term approved in WGIII SPM
SPM-2095	G-SPM-807	A	21	17			Add: ".....reduce vulnerability AND RISK to THE climate change...." (Government of Cuba)	rejected – this is implied
SPM-2096	E-SPM-1160	A	21	21	21	22	As indicated within WGII, adaptation can also reduce exposure (Roger Street, UKCIP-OUCE)	Correct – but not essential to add here; implied in rest of text
SPM-2097	G-SPM-808	A	21	21	21	23	Change "vulnerability to climate change" to "the risks of climate change" (cf. previous comment). (Government of European Community)	Wording revised
SPM-2098	E-SPM-1161	A	21	22			Suggest adding the following wording after "(through adaptation)": "and/or exposure (through reduced emissions) and enhancing coping capacity of society." (Volodymyr Demkine, UNEP)	Wording revised
SPM-2099	E-SPM-1162	A	21	22			Add sentence: 'In developing countries, the environment needs to be seen as part of the solution, and not as part of the problem.' (M. James C. Crabbe, University of Bedfordshire)	Rejected – no basis in underlying report; not clear why this should be specific to developing countries
SPM-2100	E-SPM-1167	A	21	25	21	25	Add: "....Climate change will interact with major global NATURAL RESOURCES AND OTHER environmental concerns....." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	wording revised
SPM-2101	G-SPM-810	A	21	25	21	25	Change "major" to "other" since climate change is also a global environmental concern. (Government of European Community)	accepted
SPM-2102	E-SPM-1163	A	21	25	21	27	The coupling between climate change with another global environmental concerns need to stressed from the begining of this document, not at the very end of the SPM. (Germán Poveda, Universidad Nacional de Colombia)	this section has been shifted forward
SPM-2103	E-SPM-1164	A	21	25	21	28	See prior comments and general comments, submitted separately. (Magdalena Muir, Environmental and Legal Services Ltd.)	noted
SPM-2104	E-SPM-1166	A	21	25	21	28	In this list of concerns I am missing "overexploitation of natural resources", as evidenced in many areas, notably fisheries (e.g. Worm et al., 2006). Cited reference: Worm, B., E. B. Barbier, N. Beaumont, J. E. Duffy, C. Folke, B. S. Halpern, J. B. C. Jackson, H. K. Lotze, F.	Rejected; implied in current text

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							Micheli, S. R. Palumbi, E. Sala, K. A. Selkoe, J. J. Stachowicz & R. Watson, 2006. "Impacts of biodiversity loss on ocean ecosystem services." Science, 314(5800): 787-790. http://dx.doi.org/10.1126/science.1132294 (Andreas Fischlin, Integrative Biology - Systems Ecology)	
SPM-2105	G-SPM-809	A	21	25	21	28	The term "interact" does not reflect the linkages between climate change and environmental concerns. It may be desirable to state that "climate change will accentuate current environmental stresses such as land degradation, water shortage, biodiversity loss, and desertification". (Government of India)	Rejected; coupling goes both ways
SPM-2106	E-SPM-1165	A	21	25			It is not only interactions with environmental concerns that need to be considered, but social and economic concerns as well. (Donald Lemmen, Natural Resources Canada)	wording revised
SPM-2107	E-SPM-1168	A	21	25			"Climate change will interact with major global environmental concerns, including ...". Climate change is a global environmental concern. Alternative text is "Climate change is one of several interacting global environmental concerns. The others include ..." (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	wording revised
SPM-2108	E-SPM-1169	A	21	26	21	26	it should be as follows, Climate change will interact with major global concerns, including water, soil and air pollution, natural disaster risks, health hazards, and deforestation. (Bangzhong Wang, China Meterological Administration)	wording revised
SPM-2109	E-SPM-1170	A	21	26	21	26	"health hazards" - how is this an environmental concern? Also, this category is far too broad - need to provide an example (occupational health risks related to environmental exposures? Etc) (Peter Berry, Health Canada)	wording revised
SPM-2110	G-SPM-811	A	21	26	21	26	The authors need to be careful when using defined terms such as "likely". The authors need to confirm that "likely" in this context represents an assessed uncertainty finding, otherwise "will likely" should be substituted with a synonym such as "are expected to". (Government of Australia)	relevant text deleted
SPM-2111	G-SPM-812	A	21	26	21	26	Is the "likely" in this line a formal assessment, if so italicize for clarity. (Government of United States)	relevant text deleted
SPM-2146	E-SPM-12	D	21	26	21	26	add the text "and overexploitation of natural resources e.g. fisheries" to the sentence. (Stephen Hawkins, Marine Biological Association of the UK)	Rejected; implied in current text
SPM-2112	E-SPM-1171	A	21	30	21	31	This concept is important for both adaptation and mitigation strategies, and so it could move to page 16. (Michael Manton, Monash University)	relevant text deleted, but this discussion in general has been shifted forward

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
SPM-2113	G-SPM-813	A	21	30	21	31	Replace this bullet with: "As societies have to cope with multiple stresses, activities that promote mitigation, adaptation, and sustainable development are complementary and reduce vulnerability to climate change." (Government of Canada)	relevant text deleted, but this discussion in general has been shifted forward
SPM-2114	G-SPM-814	A	21	30	21	31	Add reference to the needed comprehensive / integrative approaches, as follows: The fact that societies have to cope with multiple stresses calls for complementary activities and COMPREHENSIVE APPROACHES in promoting mitigation, adaptation and sustainable development. (Government of Cuba)	relevant text deleted, but this discussion in general has been shifted forward
SPM-2115	E-SPM-1172	A	21	31	21	31	I would add one sentence to this concluding statement. Something like - The socioeconomic costs of mitigation, adaptation and sustainable development increasing with time. Cost of action is lower now than in the future due to residence times of GHG. (David Barber, University of Manitoba)	Rejected – no basis for this unequivocal assertion. Revised SPM discusses costs and benefits of mitigation to the extent possible
SPM-2116	G-SPM-815	A	21	31	21	31	Add a section on gaps in knowledge and research needs (Government of Switzerland)	Accepted (robust findings, key uncertainties); research needs are outside the mandate of the SYR
SPM-2117	E-SPM-1173	A	21	32	21	32	adding two or three paragraphs on gaps in knowledge at the end (Zong-Ci Zhao, China Meteorological Administration)	Accepted (robust findings, key uncertainties); research needs are outside the mandate of the SYR
SPM-2118	G-SPM-816	A	21	32	21	32	It is suggested to add a paragraph on gaps in knowledge at the end (from WGIII SPM page 34 line 15-19). (Government of China)	Accepted (robust findings, key uncertainties); research needs are outside the mandate of the SYR
SPM-2119	E-SPM-1174	A	21	33	21	33	add a new section 'Robust findings and key uncertainties' (Suam Kim, Pukyong National University)	Accepted (robust findings, key uncertainties)
SPM-2120	E-SPM-1175	A	21	35	21	35	add 'Some robust findings with key uncertainties of the AR4 can be found in the longer report, including observed changes in climate, their effects and causes, projection, and society responses to climate change.' (Suam Kim, Pukyong National University)	Accepted (robust findings, key uncertainties); research needs are outside the mandate of the SYR
SPM-2121	E-SPM-1176	A	21				If this figure is to be retained (much of the data comes from just 3 models), some crucial information needs adding: the price of carbon required to achieve these potentials. The data are available and are included in WG3 chapter 3. I suggest a sentence: "Carbon prices required to achieve these potentials range between 14 and 121 US\$/tCO ₂ -eq for 2030 and ? to ? for	Figure deleted.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							2050." numbers to be checked and added. (Terry Barker, Cambridge Centre for Climate Change Mitigation Research (4CMR))	
SPM-2122	E-SPM-1177	A	21				Figure SPM-9: The legend has to be simpler but with reference to the relevant WG. Delete the 2000-2100 graph as outside the time-frame of policy makers. Make an average and a range of the four models and just present this mean and range as done for other figures in the SPM I suggest 'Cumulative GHG emission reductions (Gt CO ₂ -eq) for a range of mitigation measures 2000-2030. Presented data are the average and range of four policy models. CCS, CO ₂ capture and storage; non-CO ₂ , includes NO ₂ and CH ₄ GHG. (John R. Porter, University of Copenhagen)	Figure deleted.
SPM-2123	G-SPM-817	A	21				In Figure SPM-9, what is the meaning of CCS? Please explain in caption. (Government of United States)	Figure deleted.
SPM-2124	G-SPM-818	A	21				Figure SPM-9: This figure is important, and is usefully included in the body of the SYR, however, the authors should consider whether it is too technical for inclusion in the SPM of the SYR. (Government of Australia)	Figure deleted.
SPM-2125	G-SPM-819	A	21				Fig SPM-9. The sectors should also be included in the figure on the right. Additionally, it is unclear why there is a dotted line at 120 Gt C in the figure on the right. (Government of Norway)	Figure deleted.

Appendix to All SPM Comments (24 July, 2007)

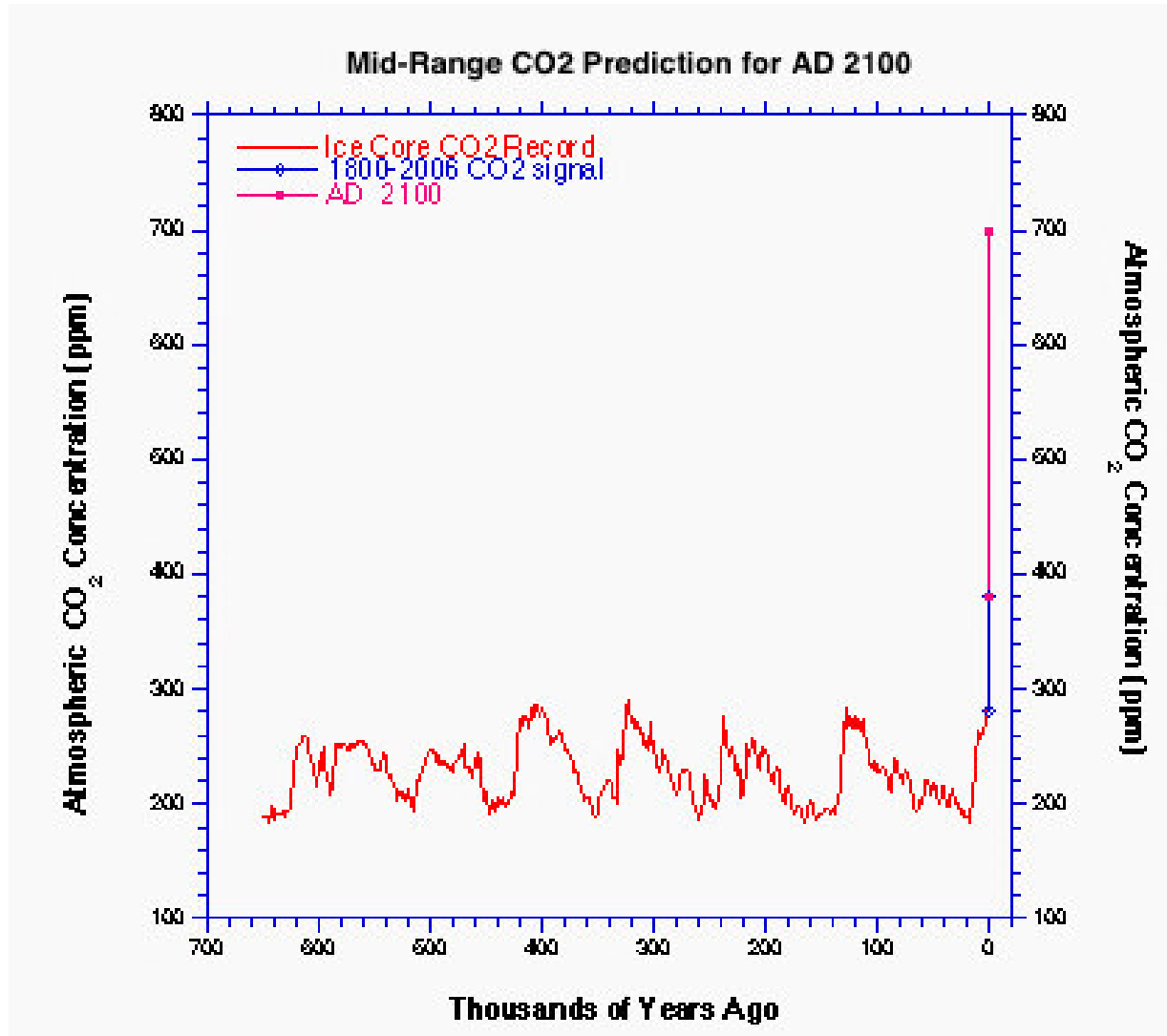
Reference to Running Number SPM-2 (Comment Number E-SPM-2-A):

Executive Summary for Policymakers

- 1 **Warming of the planet is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, rising global sea level, and poleward displacements of many species (Fig. ESPM-1 = present SPM-1).**
- 2 **The acidity of the ocean has decreased slightly, with implications for preservation of coral reefs and plankton, and therefore the oceanic food web.**
- 3 **The concentrations of greenhouse gases have increased substantially in the last 200 years.** The ~35% increase in carbon dioxide concentration represents the highest level in the last 600,000 years. The present rate of increase in carbon dioxide is approximately fifty times larger than the fastest rate of change in the geological record, at the end of the last ice age. **FIG ESPM-2 = Dome C ice core for last 600,000 years, plus anthropogenic signal**
- 4 **Most of the observed increase in globally-averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations.** It is *likely* that there has been significant anthropogenic warming over every continent except Antarctica. (Fig. ESPM-3 = SPM-4). On the global scale, it is *likely* that anthropogenic warming has had a discernible influence on many biological systems.
- 5 **Continued greenhouse gas emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would *very likely* be much larger than those observed during the 20th century (Fig. ESPM-4 = SPM-5).**
- 6 **There is now higher confidence in projected patterns of warming and other regional-scale feedbacks, including changes in wind patterns, precipitation, and some aspects of extremes and of ice.** These include a *very likely* increase in frequency and intensity of heat waves and heavy precipitation, a *likely* increase in tropical cyclone intensity, a *very likely* increase in mid-latitude precipitation, and a *likely* decrease in subtropical land areas. The largest areas to be adversely affected include the Mediterranean Basin and Middle East, western North America, southern Africa, western Australia, and northernmost South America and central America. **Fig ESPM-5 = FIG. 3.3 (net runoff changes, global).**
- 7 **It is *very unlikely* that there will be abrupt changes in the large-scale ocean circulation in the 21st century.**
- 8 **Magnitudes and nature of impacts can now be estimated more systematically for a range of possible warming scenarios (Table ESPM-1 = SPM Table 3.2).**
- 9 **There is high agreement and much evidence that there is substantial economic potential for the mitigation of global greenhouse gas emissions over the coming decades. (FIG ESPM-6 = SPM-6)**
- 10 **There is *high agreement* and *much evidence* that many mitigation options can provide co-benefits, such as reduced air pollution, which benefits human health, agriculture, and general sustainable development, and which can offset a substantial fraction of mitigation costs.**
- 11 **Mitigation efforts over the next two to three decades will have a large impact on opportunities to achieve lower stabilization levels, and long term equilibrium temperature changes below the threshold level of “dangerous human interference” with the climate system.**
- 12 **There is high agreement and much evidence that the range of stabilization levels assessed can be achieved by deployment of a portfolio of technologies that are currently available, plus those that are expected to be commercialized in coming decades. Fig. ESPM-7 = SPM-9**

- 13 The **net mid-range economic impact of mitigation on GDP (Table ESPM-2 = Table SPM 1-4) is about $1 \pm 1\%$, but with a small (*state percentage*) outlier of scenarios affecting some nations** (state type of nations, reasons for outliers – policy makers need to know this!). GDP reductions for more extreme greenhouse gas reductions can be several percentage points by mid-century.
- 14 It is very likely that anthropogenic climate change will result in net damage costs into the future that can impede nations' abilities to achieve sustainable development pathways. On the other hand, there is high agreement and much evidence that making development more sustainable can significantly reduce vulnerability to climate change by promoting effective mitigation and adaptation policies.

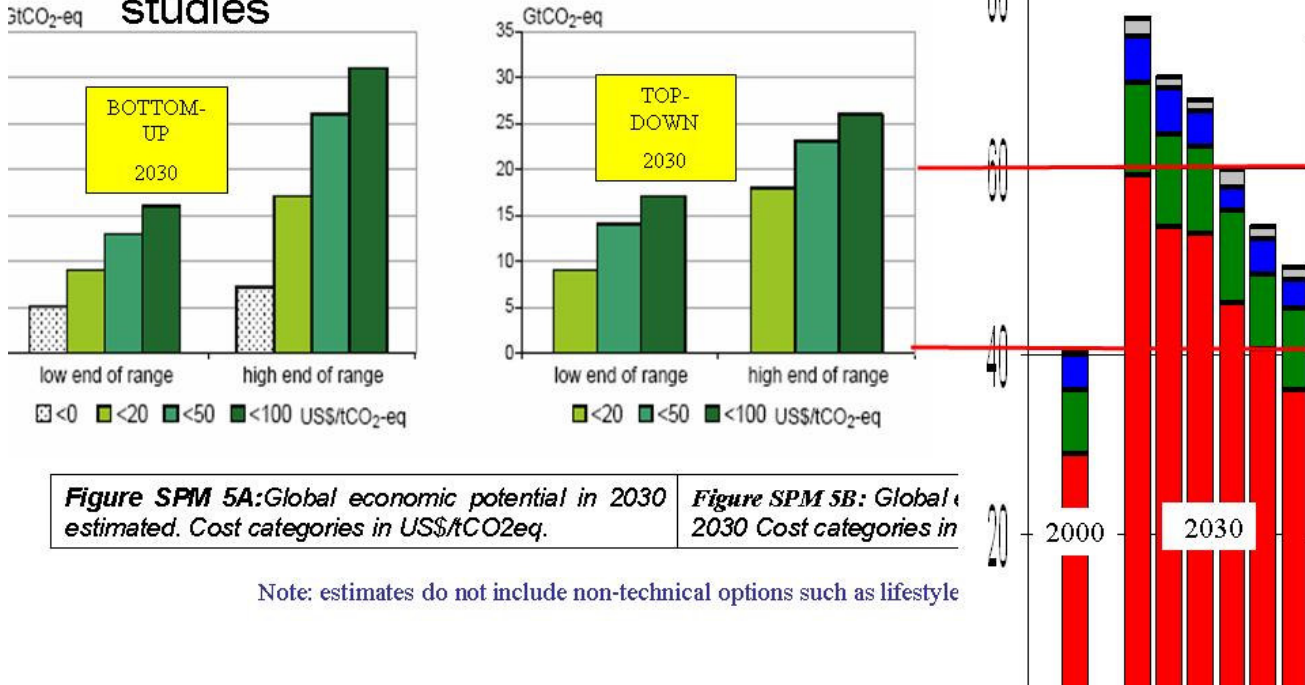
Reference to Running Number SPM-670 (Comment Number E-SPM-411-A):



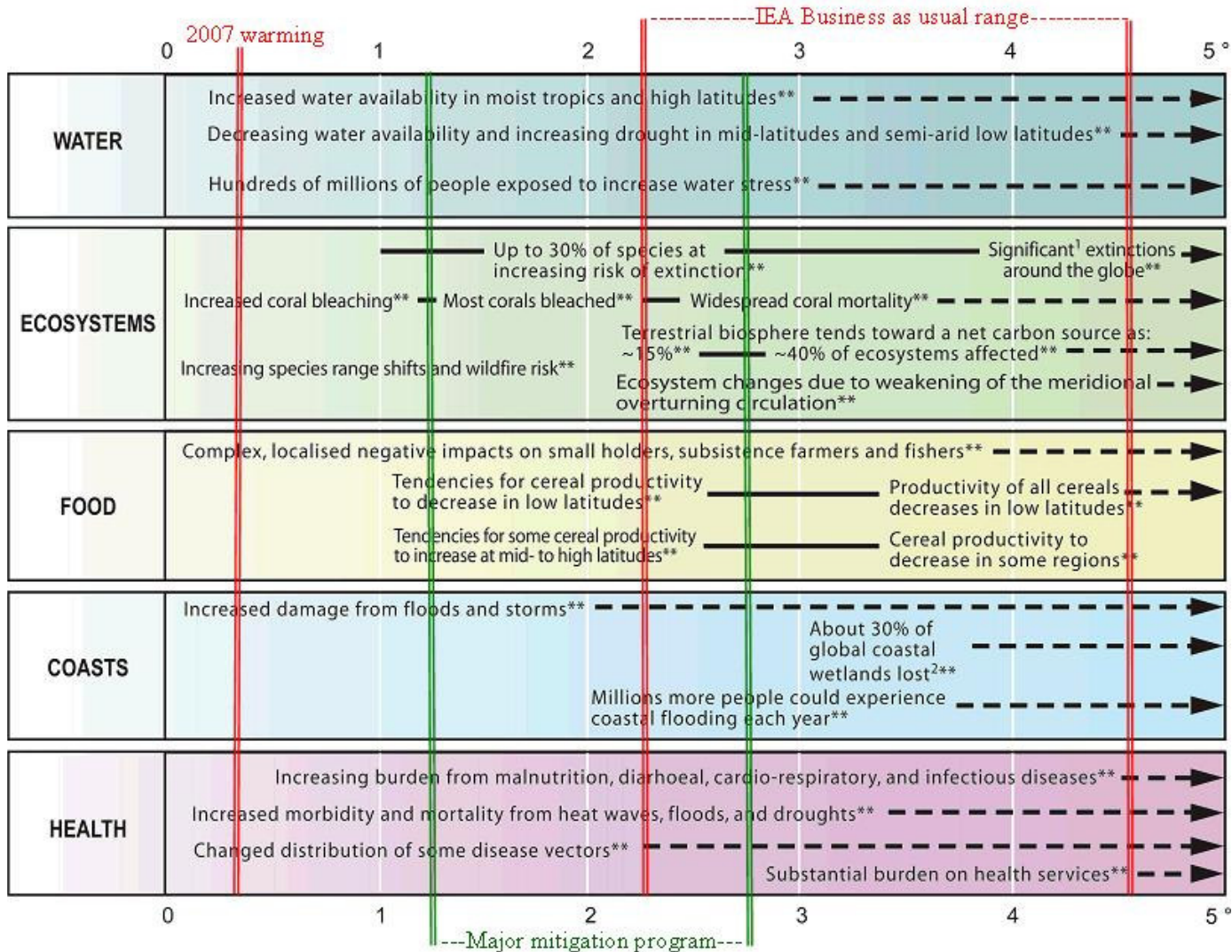
Reference to Running Number SPM-1675 (Comment Number E-SPM-953-A):

Economic potential is substantial for the mitigation of global GHG emissions over the coming decades

- Estimates are from both bottom-up and top-down studies



Reference to Running Number SPM-1245 (Comment Number G-SPM-449-A):



This modification, which adds projected warming from a reasonable business as usual case and a major mitigation case (1% global reduction per year starting in 2010), presents a very strong signal that **we have already lost the ability to avoid serious warming impacts**. At best, we can try to adapt and moderate the warming. It also illustrates that a reasonable business as usual case will yield unacceptable global impacts, which at the upper end of the warming uncertainty range, could challenge the ability of the planet to sustain the population projected by the end of the century. It also illustrates that given the weakness in our scientific understanding of the quantitative relationship of emissions to warming and the associated warming ranges, there is overlap in projected warming for a business as usual and a tough mitigation scenario. Note this graphic presents an optimistic business as usual case, relative to the possibility of a 25 year 3% growth rate. The business as usual range for this case is 2.5 to 5.5 C, the high end of which would be off the impact graphics scale.