



**IPCC Synthesis Report
Fourth Assessment Report**

Formal Government and Expert Review of First Order Draft

EXPERT and GOVERNMENT COMMENTS – TOPIC 6

All Batches (July 27, 2007)

Review Editors:
David Griggs, Australia/UK
Neil Leary, USA

IPCC Synthesis Report - Fourth Assessment Report (All comments – Topic 6 – July 27, 2007)

Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
6-1	E-6-1	A	0				This is a useful Topic. (Lisa Schipper, Southeast Asia START Regional Centre, Chulalongkorn University)	Noted – thank you.
6-2	E-6-2	A	0				There is a considerable overlap between sections 6.1 and 6.2. Section 6.1 should only deal with climate change, causes, attribution and projections into future; section 6.2 should deal with observed and expected impacts, whereas section 6.3 should cover responses, which should also include adaptation. (Zoltán Somogyi, Hungarian Forest Research Institute)	Rejected – there is no overlap in subjects covered. The coverage of sections enhances the integration of material from different Working Groups.
6-3	E-6-3	A	0				The quality of uncertainties is also important: There are no proof that within these uncertainties there might be a significant change in projected climate changes or even adverse effects. There might be enhanced or weakened warming but no steady state or cooling. This important message should be mentioned no avoid misinterpretations (Markus Erhard, European Environment Agency)	This message is in fact covered on page 2 lines 33 to 40. No change.
6-4	E-6-4	A	0				No specific comments on topic 6 (Michael Brady, Natural Resources Canada - Canadian Forest Service)	Noted.
6-5	E-6-5	A	0				message is clear. It is fine with the draft (Hisayoshi Morisugi, Japan Research Institute)	Noted.
6-6	E-6-6	A	0				I wouldn't end the report with "Key uncertainties"! but with main positive findings! (Paolo Cherubini, WSL Swiss Federal Research Institute)	Rejected. The agreed topic heading "robust findings, key uncertainties" requires an even coverage of both aspects. The sequence of statements follows the sequence of the heading.
6-7	E-6-7	A	0				Good job, congratulations! Only a little comment. If you numbered the Robust findings and the Key uncertainties, then you could introduce cross-references between a concrete finding and its connected uncertainty. For instance, pag 5, lin 8-9 and line 30. (Sergio Alonso, University of the Balearic Islands)	Thank you. Rejected suggestion for numbering – not each robust finding is related to a key uncertainty, many stand on their own.
6-8	E-6-8	A	0				General Comment- I find this chapter excellent and feel it should be better summarized in the Executive Summary/ or SPM (Ian Church, Yukon Government)	Thank you. Summarising these findings in the SPM is not possible due to space constraints, and they are embedded in the topics covered in the SPM.
6-9	E-6-9	A	0				A very well written topic (Upasna Sharma, Indian Institute of Technology, Bombay)	Thank you.
6-10	G-6-1	A	0				We suggest that Topic 6 should be the focus of the authors' work on making the SYR more useful to decision-makers. In particular, Topic 6 should provide decision makers with the tools to interpret the uncertainties contained in the key findings of the SYR. For	Rejected. Gradual levels of confidence are not consistent with the definition of "robust

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							example at present, there is very little information in the SYR findings on the costs of mitigation action, which alerts policy makers to the fact that the modelling of the costs is based on an idealised situation with a perfectly functioning global market. Topic 6 could also be used to it needs to grade the findings of the SYR from very high confidence to low confidence and pair this assessment with the discussion of key risks. Transparency in the findings of the SYR will be improved by better communicating assumptions and confidence. Such a treatment could also be a guide for how future assessments can be carried out. For example, graduated levels of confidence for contributing influences on specific aspects of sea level rise (i.e. well understood thermal expansion, vs poorly understood dynamical changes in ice flows) would be very useful for policy makers. (Government of Australia)	finding” (continuing the definition used in the TAR). The suggestion would be more applicable to “key findings”, which the introduction to Topic 6 points out are different from robust findings.
6-11	G-6-2	A	0				To give the reader a proper characterization of uncertainties, the key uncertainties in this topic should be addressed in relevant sections of other topics. At the moment, only some of the uncertainties are discussed in the previous topics. As a result the reader is given a false sense of greater certainty than exists in the literature. The authors need to carefully insert each of these key uncertainties in the relevant discussions in previous topics. (Government of United States)	Uncertainties are now noted at all relevant points in Topic 1. Taken into account in revisions of the topics where key uncertainties place important caveats or limits on findings reported in the other topics.
6-12	G-6-3	A	0				This section is wholly redundant with material provided previously and is unnecessary. Suggest deletion of the entire section to help authors conform to page constraints. (Government of United States)	Rejected – this Topic is required under the decision by the IPCC Panel on the SYR.
6-13	G-6-4	A	0				Some of the key uncertainties in topic 6 should also be presented in SPM. (Government of China)	Taken into account in revisions to the SPM where relevant.
6-14	G-6-5	A	0				It is suggested to list the robust findings and key uncertainties in a table, just like TAR. It can also include several columns using the subheads as column title. (Government of China)	Rejected – listing in a Table could imply a correlation between specific robust findings and key uncertainties, which is not necessarily intended. See also comment 6-7.
6-15	G-6-99	A	0				Robust findings, key uncertainties gives a good and stressed orientation to the readers. However, in spite of the increase and broadening of knowledge and experience, the revealed facts and explored relationships concerning the living world (biosphere), there is not given proper emphasis to the expected impacts of climate change and the possible adaptation opportunities concerning the Earth's biota and natural ecosystems. The trophic structure and function /organic matter production-consumption and decomposition/ of the ecosystems make nutrients reusable and therefore give the basis for continuity of life on Earth. More emphasis could be given to natural systems, to the	Rejected. The suggested specific findings would not qualify as “robust” in the detail that is suggested. Topic 6 has no mandate to present research priorities, nor is there adequate basis across all three Working Group reports for such a summary of research priorities.

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							irreversibility of their changes, to their threshold-type responses, to the potential damages in ecosystem functions and services. If the reason of not giving emphasis to these topics is the lack of proper knowledge, the solution is to stress the importance of further research. More generally, in light of the clear indication of insufficiency of evidences in various areas, it would be very important to emphasize the need for further research. It should also be mentioned that there is a considerable overlap between sections 6.1 and 6.2. Section 6.1 could more reasonably deal only with climate change, causes, attribution and projections into future; section 6.2 with observed and expected impacts, whereas section 6.3 could also include adaptation. (Government of Hungary)	
6-16	E-6-10	A	1	1	5	30	No comments other than how one focusses on costs (or doesn't in this case). (John Nyboer, Simon Fraser University)	Comment not clear.
6-17	E-6-11	A	1	2	1	2	This sentence refers to models ('method, models, and'). In the Glossary, explanation of 'Model' is 'see Climate model'. The models in this sentence related not only Climate models, but also other models such as emission, impact and integrated model. Also the model in 'model-dependent' in Line 49, Page 3, in Topic6 includes integrated assessment models. My suggestion is to add an explanation of integrated assessment models in the Glossary. (Kainuma Mikiko, National Institute for Environmental Studies)	Accepted – added to glossary.
6-18	E-6-1	B	1	12	1	14	Here it is said that robust findings provide important cornerstones for climate change decision-making but they do not summarise all knowledge that may be relevant for prudent risk management. Despite this, I would encourage the authors to do all they can in this section (6) to address decision-making that can contribute to prudent risk management. Framing the findings here so they can contribute better to decision-making would help. Sorry not to here more practical examples here but some are encapsulated in my other comments. It would be wonderful to finally state in a such a synthesis that based on the collated findings from the three Working Groups that the risks of acting on climate change, by striking out on pathways established by the working groups and exercising a portfolio of adaptation and mitigation options, that the risks of acting outweigh those if not acting (level of confidence). I believe the reports contain information consistent to make that conclusion and that such a conclusion, while contentious, would be policy relevant – not policy prescriptive. (Roger Jones, CSIRO)	This goes beyond the scope for Topic 6, which must focus specifically on robust findings and key uncertainties. Specific suggestion rejected, as it does not qualify as "robust". Text shortened for space reasons.
6-19	E-6-12	A	1	23	1	23	Change title to: "Observed changes in climate. Effects and causes of climate change" (Zoltán Somogyi, Hungarian Forest Research Institute)	Rejected. This does not seem to be an improvement.
6-20	G-6-6	A	1	23	1	23	Change title to: "Observed changes in climate. Effects and causes of climate change" (Government of Hungary)	Rejected. This does not seem to be an improvement.
6-21	E-6-13	A	1	27	1	27	Delete 'unequivocal', revising the sentence to: "Warming of the climate system is now evident from ..."	Rejected. "Unequivocal" is approved WGI SPM language.

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							(Claire Parkinson, NASA Goddard Space Flight Center)	
6-22	G-6-7	A	1	28	1	28	Please drop the word “widespread” in the sentence (Government of India)	Rejected. “Widespread” is approved WGI SPM language.
6-23	G-6-9	A	1	31	1	31	The documented patterns of warming are more robust. The patterns are what they are. (Government of United States)	This robust finding has been deleted.
6-24	E-6-14	A	1	31	1	32	"more robust" than what? (Jon Egill Kristjansson, University of Oslo)	See 6-23
6-25	G-6-8	A	1	31	1	32	The phrase "to higher altitudes" is not clear, suggest to give the specific height. (Government of China)	See 6-23
6-26	G-6-10	A	1	31	1	32	The authors should consider whether the "patterns of warming" are more robust, or whether or understanding of these patterns is now more robust. (Government of Australia)	See 6-23
6-27	G-6-1	C	1	31	1	32	" Should include here a rough description of warming patterns (e.g. Warming is expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean (i.e. the oceans near Antarctica) and northern North Atlantic (from sect (Government of Belgium)	See 6-23
6-28	E-6-15	A	1	32	1	32	maybe change "more robust" to "clearer"; ie. discernible from natural climate variability (Janice Lough, Australian Institute of Marine Science)	See 6-23
6-29	E-6-16	A	1	32	1	32	"now more robust:" than what? Either they are robust or they are not. (Alan Robock, Rutgers University)	See 6-23
6-30	G-6-11	A	1	32	1	32	replace “more robust” by “more consistent”. (Government of India)	See 6-23
6-31	G-6-12	A	1	34	1	36	The fact should be indicated that the temperature is not warming in Antarctic plateau, which is not consistent with "a warming world". (Government of China)	Replaced “a warming world” with “warming”, which matches Topic 1 text more closely.
6-32	G-6-13	A	1	34	1	36	Suggest to add "The effects of observed climate change on human and managed systems are emerging." (Government of European Community)	Not a robust finding.
6-33	E-6-17	A	1	35	1	36	A more strong wording would seem proper here, given the "over 89%" figure. Perhaps: "Most (or "great majority") changes in physical and biological systems are consistent with a warming world". (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	“Many” is approved WGII SPM language.

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6-34	E-6-18	A	1	38	1	38	To add "(GHG)" after "greenhouse gas" and then elsewhere in the text of this Topic to replace "greenhouse gas(es)" with "GHG(s)" (moreover, the term "Greenhouse gas (GHG)" is included in the Glossary, p. 13) (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Accepted
6-35	G-6-16	A	1	38	1	38	The authors need to explain how the GHGs are combined to derive this 70% increase? Relative to what baseline period? (Government of Australia)	Taken into account
6-36	G-6-14	A	1	38	1	42	The fourth parameter affecting anthropogenic emissions (i.e., GHG intensity) is omitted from this finding. It needs to be included. (Government of United States)	Text deleted for space reasons.
6-37	E-6-19	A	1	38	1	43	The sentences 'the effect on global emissions of the decrease in global energy intensity (-33%) during 1970 to 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.' are a little bit confusing. 'global income growth(77%)' should be replaced by 'per-capita GDP growth(xx%)'. From Figure SPM.2 of WG3, the growth of per-capita GDP cross over 1.8. So please check the growth rate. If 77% is correct, the GDP growth (combined effect) is 2.99 (less than 3). From Figure SPM.2, it looks over 3.0. As for sentence 'the decrease in the global intensity (-33%)', it should be 'the change in the global intensity (-33%)' or 'the decrease in the global intensity (by 33%)'. It seems clear to use 'GDP' instead of 'income'. 'Income' has several different definitions. (Kainuma Mikiko, National Insititue for Environmental Studies)	Text deleted for space reaons.
6-38	E-6-20	A	1	38	1	43	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)	Text deleted for space reasons.
6-39	G-6-15	A	1	38	1	43	The authors should consider whether this paragraph would be better placed in section 6.2 "Drivers and projections of future climate change". (Government of Australia)	Rejected because 6.2 is about the future
6-40	E-6-22	A	1	39	1	39	put "on global emissions" after "2004" (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Taken into account
6-41	E-6-21	A	1	39	1	42	The second sentence in the paragraph 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)	Text deleted for space reaons.

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6-42	G-6-17	A	1	39	1	42	The sentence beginning with “The effect on global emissions ...” may be deleted, as it does not represent a robust finding. (Government of India)	Text deleted for space reasons.
6-43	G-6-18	A	1	39	1	42	Section unclear. Needs to be better explained. (Government of United States)	Text deleted for space reasons.
6-44	G-6-19	A	1	39	1	42	Delete “The effect on global emissions ... energy-related CO2 emissions”, just discuss the increase quantity here. (Government of China)	Text deleted for space reasons.
6-45	E-6-23	A	1	42	1	43	Revise “are now at levels unprecedented” to “are now at levels thought to be unprecedented”. (Claire Parkinson, NASA Goddard Space Flight Center)	Rejected, because it’s based on observed data
6-46	E-6-24	A	1	42	1	43	In fact CO2 concentrations are the highest for at least 650,000 years, which is worth mentioning! (Jon Egill Kristjansson, University of Oslo)	Accepted
6-47	G-6-21	A	1	42	1	43	10,000 years is a too careful comparison. SPM of WG-I states 650 000 years for CO2 and CH4, but nothing for N2O. The same source writes 10,000 years for radiative forcing where N2O plays a minor role. So, it is recommended to omit N2O and to change 10,000 to 650,000. (Government of Hungary)	Accepted
6-48	G-6-20	A	1	42	1	44	It should be added that levels of CO2, the most important anthropogenic greenhouse gas, are unprecedented in at least 650.000 years. (Government of European Community)	Accepted
6-49	E-6-25	A	1	43	1	43	What is the basis for having 10,000 years here--it is likely at least 750,000 and likely much, much more. (Michael MacCracken, Climate Institute)	Accepted
6-50	E-6-27	A	1	43	1	43	Change “in at least 10,000 years” to “in many thousand years” to be consistent with the text in Topic 1, Pg 3, lines 17-19. (Robert Siveter, IPIECA)	Accepted
6-51	G-6-22	A	1	43	1	43	Change “in at least 10,000 years” to “in many thousand years” to be consistent with the text in Topic 1, p. 3, lines 17-19. (Government of United States)	Accepted
6-52	E-6-26	A	1	43			Question: “10,000 years”? (Hartmut Grassl, Max Planck Institute for Meteorology)	Accepted
6-53	G-6-23	A	1	45	1	47	Why the confidence in continent scale decrease to “likely”, from WGI SPM? There is no difference from the global mean curve.	Not true, it’s also “likely” in WGI SPM

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							(Government of China)	
6-54	G-6-24	A	1	45	1	47	Replace with the agreed language from the WG2 SPM. (Government of United States)	Comment not clear – statement is based on WGI SPM.
6-55	E-6-28	A	1	46	1	46	"that" needs to be inserted between "likely" and "there" (Jon Egill Kristjansson, University of Oslo)	Accepted
6-56	E-6-29	A	1	47	1	47	Elsewhere in the report the wording 'every inhabited continent' has been replaced with 'every continent except Antarctica'. (Nathan Gillett, University of East Anglia)	Accepted
6-57	G-6-25	A	2	1	2	1	Add at the beginning "Thus," or "As a consequence,". This statement is not a new finding but the logical implication of the preceding ones. (Government of France)	Rejected; statement is correct as it stands on its own.
6-58	E-6-30	A	2	1	2	3	This text can be combined with line 34-36 on p. 1 (Roman Corobov, Modern institute for humanities)	Accepted
6-59	G-6-26	A	2	5	2	10	Delete. Superfluous. "Robust findings" are not defined above. These lines define key uncertainties; to be consistent, simply present the key uncertainties, which are already defined in this topic. (Government of United States)	Comment not clear.
6-60	E-6-32	A	2	5	2	24	Aren't 'natural' phenomena such as the Atlantic Multidecadal Oscillation and their effect on global temperature a key uncertainty in identifying anthropogenic climate change signals? (Robert Molinari, University of Miami)	Natural variability phenomena such as the Atlantic Multidecadal Oscillation are an important uncertainty in identifying anthropogenic climate change at sub-global scales and this is dealt with by the statement: "Difficulties remain in reliably simulating and attributing observed temperature changes to natural or human causes at smaller than continental scales." At the global scale, attribution of anthropogenic climate change is robust despite the presence of such climate patterns (see robust findings in 6.1).

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6-61	G-6-2	C	2	5	2	24	" Key uncertainties should also include the major lack of observations above Antarctica" (Government of Belgium)	Covered above
6-62	E-6-31	A	2	5			It strikes me as rather inconsistent that the level of scientific understanding of solar irradiance is considered low (see figure 2.4 in topic 2), but that this is not mentioned as a key uncertainty. (Marcel Marchand, Delft Hydraulics)	It's not a key uncertainty because the attribution takes account of the low level of scientific understanding of solar irradiance changes
6-63	E-6-33	A	2	7	2	9	This statement seems to be too general to be useful. The comment seems to focus on climate impacts, but the topic as a whole includes climate change itself. I think it is not true to say for example that a key uncertainty in our assessment of global climate change is due to geographical imbalance in data and literature. There are many global assessments of temperature change. I think the category of climate change, its effects and its causes is too wide to be able to apply a useful general statement of the type given here. (Nathan Gillett, University of East Anglia)	Replaced by: "Climate data coverage remains limited in some regions and there is a notable lack of geographic balance in data and literature on observed changes in natural and managed systems, with marked scarcity in developing countries. {1.3, WGI SPM}"
6-64	E-6-34	A	2	11	2	13	It seems to me that this is not a methodological problem, but rather a problem of scale. The analyses of extremes needs much longer time scales, but still covered with high-resolution data. (Gian-Reto Walther, University of Bayreuth)	Replaced with "Analyzing and monitoring extremes including drought, tropical cyclones, extreme temperatures, and the frequency and intensity of precipitation is more difficult than for climatic averages as it requires longer data time-series of higher spatial and temporal resolution".
6-65	E-6-35	A	2	11	2	13	Is it really the "methods" that are "less well developed"? Isn't it mainly that we lack the observations (especially over a sufficient length of time) rather than the "methods to analyze" them. The paragraph refers to WG1 3.8. Reading the summary (section 3.8.5) of that chapter, the first words are "Even though the archived data sets are not yet sufficient for determining long-term trends in extremes". Later on, the difficulty in drawing a consistent picture of changes in extreme precipitation for the tropics and subtropics is put down as "mainly because of the lack of data". Similarly, for tropical cyclones "limitations in the quality of data compromise evaluations of trends". (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	See 6-64
6-66	G-6-27	A	2	11	2	13	The problem is not just that methods are less developed, but that the establishment of significant changes in higher level moments with limited data is fundamentally more difficult. "Analysis of extremes, including ..., is fundamentally more difficult than that of means. This requires development of new analysis methods and monitoring of additional data."	See 6-64

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							(Government of United States)	
6-67	G-6-28	A	2	11	2	13	Replace by : "Analyzing and monitoring extremes including drought, tropical cyclones, extreme temperatures, and the frequency and intensity of precipitation is much more difficult than for climatic averages and require adequate methods which are still being developed. . (Government of France)	See 6-64.
6-68	G-6-29	A	2	13	2	13	Please rewrite "methods for analyzing climatic averages... (Government of India)	See 6-64.
6-69	G-6-32	A	2	15	2	15	"(...) changes in human AND SOCIO-ECONOMIC systems (...)" (Government of Hungary)	Rejected. Human systems by definition include socio-economic systems.
6-70	G-6-31	A	2	15	2	16	My opinion is that this assertion is flawed. Please, see my note number 4. [TSU note: See Comment G-1-134-A] (Government of Brazil)	Studies of non-human systems do take complexity into account. Many ecosystem studies are done in areas removed from multiple factors eg phenological gardens.
6-71	G-6-30	A	2	15	2	21	The strong statements in Topics 4 and 5 do not reflect these uncertainties, again resulting in an internal inconsistency in this report. (Government of United States)	Topics 4 and 5 are about projections. Effects can still be difficult to detect, even if we are confident in projections. Topic 4 does not deal with detection or attribution. Looks like a Topic 1 issue.
6-72	E-6-36	A	2	18	2	21	A sentence seems missing here, between the first and second. The second sentence talks about "other factors" that "also complicate the detection". The missing sentence should explain what the primary factor is (or factors are) that complicates (or complicate) the detection. Are these the lack of time series of observations that are sufficiently long to separate out the climate signal from the noise, and the poor performance of models at smaller than continental scales? (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Taken into account
6-73	G-6-33	A	2	18	2	21	Regional temperature changes are also complicated by land cover, topography, proximity to larger water bodies, and regional circulation patterns that are more complicated than continental-scale responses (Government of United States)	We have mentioned the key uncertainties

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6-74	E-6-37	A	2	19	2	21	But more fundamentally, if you can't detect the climate change itself, then you won't be able to detect its affect on physical and biological systems. (Nathan Gillett, University of East Anglia)	Taken into account
6-235	E-6-1	D	2	20	2	20	add "overexploitation of natural resources". (Stephen Hawkins, Marine Biological Association of the UK)	Implicit in land-use change
6-75	E-6-38	A	2	23	2	23	"gas" needs to be inserted between "greenhouse" and "emissions" (Jon Egill Kristjansson, University of Oslo)	Accept
6-76	E-6-39	A	2	24	2	24	"individual methane sources" - the difficulty is deeper than this - we do not understand the overall methane budget at the moment, and in particular the reasons why the growth rate has dropped to zero - this makes any attempts to project future concentrations of methane dodgy at best. (Keith Shine, University of Reading)	Taken into account
6-77	G-6-34	A	2	24	2	24	For the broader readership of the SYR the authors should include some explanation of the phrase "individual methane sources". (Government of Australia)	Taken into account
6-78	E-6-40	A	2	26	2	26	Not clear what "their impacts" means: what does "their" refer to? (Zoltán Somogyi, Hungarian Forest Research Institute)	Rejected. Title seems clear.
6-79	G-6-35	A	2	26	2	26	Not clear what "their impacts" means: what does "their" refer to? (Government of Hungary)	Rejected. Title seems clear
6-80	E-6-41	A	2	28			Add a new sentence on section 6.2 FUTURE NEGATIVE IMPACTS HAVE BEEN PROJECTED ON SECTORS LIKE : FOOD, WATER , HUMAN HEALTH AND ON REGIONS LIKE: ARTIC, SMALL ISLANDS, AFRICA AND ASIA MEGADELTAS DIRECTLY RELATED WITH THE HUMAN WELL BEING (SPM 2; 3.3) (Avelino G. Suarez Rodriguez, Ecology and Systematic)	New bullet on impacts added to robust findings..
6-81	G-6-36	A	2	30	2	30	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)	Reject. Using approved WGIII language.
6-82	G-6-38	A	2	30	2	30	Delete the word "sustainable" : if the current policies do not permit to avoid a GHG emissions growth, how can the related development practices be qualified as sustainable ? (Government of France)	Reject. Use approved WGIII language.
6-83	E-6-42	A	2	30	2	31	This seems to be a very weak conclusion. 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. Furthermore, "the next few decades" seems a very short timescale, especially in view of the expected growth in concentration.	Reject. Use approved WGIII language.

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							(Archie McCulloch, University of Bristol)	
6-84	G-6-37	A	2	30	2	31	It is not consistent with that in WGIII SPM, please replace "policies" with "practices" (see page 4 point 3 in WGIII SPM). (Government of China)	Accepted. Used approved WGIII SPM language.
6-85	G-6-39	A	2	30	2	31	Delete first phrase of this line. The sentence should read "Global greenhouse gas emissions will continue to grow over the next few decades." The phrase tacked on at the beginning detracts from the otherwise clear, concise, correct statement. Statement should be revised to match language from the AR4. (Government of United States)	Rejected. Used approved. WGII SPM.
6-86	G-6-41	A	2	33	2	33	Replace "a range" by "the range" (Government of France)	Text modified to use approved WGI SPM language.
6-87	G-6-40	A	2	33	2	34	Suggest also noting that there is a very high likelihood that some regions like the Arctic will experience high rates of warming. (Government of United States)	Now addressed by breaking of following paragraph.
6-88	G-6-42	A	2	35	2	35	Insert a new paragraph (taken from topic 2, page 6,line 3 to 6) : "The equilibrium climate sensitivity, defined as the global average surface warming following a doubling of CO2 concentrations, is likely to be in the range 2 to 4.5°C with a best estimate of about 3°C, and is very unlikely to be less than 1.5°C.Values substantially higher than 4.5°C cannot be excluded. (Government of France)	Partly accepted, new finding on climate sensitivity added.
6-89	E-6-43	A	2	36	2	38	The phrase "would very likely" needs to be changed to "will"--there is no question that many of the changes will be larger--the text does not say this for all. (Michael MacCracken, Climate Institute)	Rejected. Approved WGI SPM language.
6-90	E-6-44	A	2	36	2	40	Once again, the reader is led into the view that the climate responds directly to GHG emissions. The corollary to this paragraph and to the previous lines 30-31 is that warming would fall in line with a reduction in emissions. This gives a wholly false impression of the magnitude of the reductions required. (Archie McCulloch, University of Bristol)	Rejected. Approved WGI SPM language. The text seems clear.
6-91	E-6-45	A	2	39	2	39	..."more at northern high latitudes..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Rejected. Text seems clear.
6-92	E-6-46	A	2	39	2	39	"more in northern high latitudes" than where? (Jon Egill Kristjansson, University of Oslo)	Rejected. Text seems clear.
6-93	E-6-47	A	2	42	2	42	The phrasing 'Warming TENDS to reduce....' is odd phrasing for a "Robust Finding". (Steven Clemens, Brown University)	Reject. Approved WGI SPM language.

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6-94	G-6-43	A	2	42	2	42	Here it might be advisable to state “anthropogenic and natural” instead of “anthropogenic” because a greater fraction of the plant and soil respiration (CO ₂) will remain in the atmosphere, particularly with the acceleration of carbon cycle feedbacks. (Government of United States)	Rejected due to lack of space, please refer to the underlying report Approved WGI SPM language.
6-95	G-6-45	A	2	42	2	42	“Tends” is ambiguous. Does it or doesn’t it and with what likelihood? (Government of United States)	Rejected, Approved WGI SPM text language.
6-96	E-6-48	A	2	42	2	43	Delete this finding. It is not robust. WG I, Chapter 7 indicates that the warming of the last 50 years has not changed the fraction of anthropogenic CO ₂ emissions retained in the atmosphere. Model results for amount of additional atmospheric CO ₂ as a result of carbon cycle feedbacks vary by more than an order of magnitude, from 20 to 220 ppm. (WGI, 10.4) (Robert Siveter, IPIECA)	Rejected Models are consistent on sign. Magnitude is uncertain.
6-97	G-6-44	A	2	42	2	43	Delete this finding. It is not robust. WG1 Chapter 7 indicates that the warming of the last 50 years has not changed the fraction of anthropogenic CO ₂ emissions retained in the atmosphere. Model results for amount of additional atmospheric CO ₂ as a result of carbon cycle feedbacks vary by more than an order of magnitude, from 20 to 220 ppm. (WGI, 10.4) (Government of United States)	Rejected Models are consistent on sign. Magnitude is uncertain.
6-98	G-6-46	A	2	46	2	46	Replace the beginning of the sentence by "Anthropogenic warming would continue for many decades and sea level rise for centuries ..." (Government of France)	Rejected. Approved WGI SPM language.
6-99	E-6-49	A	2	46	2	48	This is a pretty useless comment--not giving any sense of the range of possibilities or the commitment to future warming--even if stop all emissions now. The material needs the context of paleoclimate results, and the potential for rapid change in the near term. (Michael MacCracken, Climate Institute)	Rejected. Comment does not give suggestion for change that would allow statement to remain robust.
6-100	G-6-47	A	2	46	2	48	Here, some indication of the time frame for stabilization should be stated explicitly (e.g., by 2100 or 2200). (Government of United States)	Rejected. Statement is true, independent of scenario.
6-101	E-6-50	A	2				Section 6.2 - this seems to be biased towards robust findings on projections of future climate change with only 2 paragraphs on impacts which are not very specific. What about all the work on species, water, agriculture, etc. mentioned earlier in the report? (Paula Harrison, Oxford University Centre for the Environment)	New bullet on impacts added..
6-102	E-6-51	A	3	1	3	4	Too long sentence and not very clear (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Bullet deleted.
6-103	E-6-52	A	3	1	3	4	This statement is seriously flawed--we have not reduced our uncertainty about the most critical terms controlling sea level--that uncertainty has grown. (Michael MacCracken, Climate Institute)	Bullet deleted.

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6-104	G-6-48	A	3	1	3	5	The meaning is not clear and couldn't explain the measurement and timing of the impacts very well. Please rewrite it. (Government of China)	Bullet deleted.
6-105	G-6-49	A	3	1	3	6	Delete. This does not describe a "Robust finding" as defined in this chapter. It does not even define a finding. (Government of United States)	Accepted.
6-106	E-6-53	A	3	3			There is reference to "changes in climate and sea-level" as if sea-level is somehow separate from climate, rather than an intrinsic part of it. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Bullet deleted.
6-107	E-6-54	A	3	5	3	5	Perhaps, rather: "depend also on non-climatic drivers and adaptation". The effect of climatic drivers is, after all, already mentioned above. (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Bullet deleted.
6-108	E-6-55	A	3	7	3	8	The formulation is a bit complex as it now stands. Suggest using: "Impacts due to extreme weather, climate and sea-level events are very likely to change." Possibly add to the end: "due to altered frequencies and intensities of such events". (Cf. also Topic 3, page 12, lines 1-2.) (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Text modified.
6-109	E-6-56	A	3	7	3	8	Similarly, there is reference here to "extreme weather, climate and sea-level events". Aside from sea-level being an intrinsic part of climate, surely a change in the characteristics of extreme weather events is a climate event in itself. I think the phrase in question could be simplified to "extreme climate events", or, as the context is clear, simply "extreme events". (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text modified.
6-110	G-6-51	A	3	7	3	8	Impacts do not "change", they occur. Suggest to change to "Anticipated changes in extreme events will very likely have impacts on many sectors and systems." Alternatively, the sentence could be dropped since it is very similar to the following sentence. (Government of European Community)	Text modified.
6-111	G-6-50	A	3	7	3	10	To this statement, or as a new statement, add "Evidence since the TAR has shown a poleward migration of storm tracks in some regions that will put some populations and infrastructure at increased risk." [WGI 31., 10.3; SPM] (Government of United States)	Rejected. Space limitations hinder including these details.
6-112	G-6-52	A	3	8	3	8	Instead of "to change", write "to occur". (Government of Hungary)	Text modified.
6-113	G-6-53	A	3	8	3	8	For "some" weather events.. please specify what are these some events.. (Government of India)	Text modified.
6-114	G-6-54	A	3	12	3	12	Please specify sectors in place of some (Government of India)	Space constraints – see Tables in Topic 3. Text modified.

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6-115	G-6-55	A	3	12	3	14	Add "including high-income countries" after "some sectors and regions". (Government of European Community)	Accepted.
6-116	E-6-57	A	3	12	3	15	The situation with regard to the major ice sheets also should be listed as raising the cause for concern. (Michael MacCracken, Climate Institute)	Beyond scope of this point.
6-117	E-6-58	A	3	14	3	14	Could omit, for brevity, "as compared to the findings of the Third Assessment Report." (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	An important benchmark – the main point, actually
6-118	E-6-60	A	3	17	3	17	The phrase "over a very long time frame (millennia)" should be deleted--it is based only on seriously flawed models and is contradicted by the rates of climate change seen in paleoclimatic records. (Michael MacCracken, Climate Institute)	Bullet deleted.
6-119	G-6-59	A	3	17	3	18	Delete "over a very long time frame (millennia)" because that is irrelevant and misrepresents the lack of consensus that is referred to on line 21. Should the Greenland Ice Sheet melt in 300 years, it would still have the stated impacts. Should it melt in 50 years it would still have those impacts. The time frame is irrelevant. (Government of United States)	Text deleted not a robust finding due to uncertainty.
6-120	G-6-60	A	3	17	3	19	Add "and low-lying islands" after "river deltas". (Government of European Community)	Text deleted not a robust finding due to uncertainty.
6-121	E-6-59	A	3	17	3	21	The topic here is "Robust findings". But the mention of "millennia" is hardly robust since the ice sheet models are anything but. Also the discussion of uncertainty properly occurs in the next section, where the existing comment on ice sheets could be expanded. A truly robust finding would be represented by the following wording "Widespread deglaciation of the Greenland or West Antarctic ice sheets over long time frames, which would raise global sea level by as much as 7m and about 5m, respectively, has the potential to cause very large impacts, including major changes in coastlines and inundation of low-lying areas, with greatest effects in river deltas." (Michael Oppenheimer, Princeton University)	Text deleted not a robust finding due to uncertainty.
6-122	E-6-61	A	3	17	3	21	need to include the thermal expansion contribution here also since it can be in excess of a metre. (John Church, CSIRO)	Text deleted not a robust finding due to uncertainty.
6-123	G-6-56	A	3	17	3	21	This statement may be overly cautious. As written, the statement is more true of the state of science for the TAR. For the AR4 there is more evidence for a higher likelihood of "widespread deglaciation of Greenland well before the millennia noted here, and more likely that significant deglaciation (a meter or more sea-level rise equivalent) is possible – within a century or two given the recent evidence of rapid acceleration of the movement of many outlet glaciers, that may be accelerating due to lubrication of their bases by surface meltwater derived from ever increasing surface melting, as well as rising sea	Text deleted not a robust finding due to uncertainty.

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							levels and glacial quakes that have been recently recognized as important processes. See refs [AR4 WGI Chapter 4 4.6.2.2.1]. (Government of United States)	
6-124	G-6-57	A	3	17	3	21	This paragraph should be moved to the Key uncertainties under this paragraph. (Government of China)	Text deleted not a robust finding due to uncertainty.
6-125	G-6-58	A	3	17	3	21	Suitable indication of the confidence levels associated with this statement may please be incorporated (Government of India)	Text deleted not a robust finding due to uncertainty.
6-126	E-6-62	A	3	17			Change "over a very long time frames (millennia)" to something like "over millennial time scales". One could also add "possible" before "over" and place the phrase between commas. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text deleted not a robust finding due to uncertainty.
6-127	E-6-66	A	3	19	3	19	replace "inundation" with "flooding" (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Text deleted not a robust finding due to uncertainty.
6-128	G-6-62	A	3	19	3	19	It is suggested to add "over the world" after "river deltas". (Government of China)	Text deleted not a robust finding due to uncertainty.
6-129	E-6-63	A	3	19	3	21	This sentence dealing with Antarctica describes more a "key uncertainty" than a "robust finding", maybe it should go in the next paragraph (in fact lines 40-43 of this page already deal with this). (Annarita Mariotti, ENEA)	Text deleted not a robust finding due to uncertainty.
6-130	E-6-67	A	3	19	3	21	Comment: Uncertainty. Covers it from line 40 to 43." (Hartmut Grassl, Max Planck Institute for Meteorology)	Text deleted not a robust finding due to uncertainty.
6-131	G-6-61	A	3	19	3	21	It seems incongruous that "uncertain processes" to which there is no consensus on magnitude, should be included as a "robust finding", especially as it is then included as a "key uncertainty". Suggest that this sentence (and possibly the paragraph) is deleted. (Government of Australia)	Text deleted not a robust finding due to uncertainty.
6-132	G-6-63	A	3	19	3	21	Increased ice flow of grounded ice raises sea levels even before the ice has melted. Hence, "accelerate the melting" should be changed to "accelerate sea-level rise". (Government of European Community)	Text deleted not a robust finding due to uncertainty.
6-133	E-6-64	A	3	19			The use of the phrase "low-lying areas" is misleading: we are discussing a 7 metre rise (over millenia) in this paragraph. (Leonard Allen Smith, London School of Economics)	Text deleted not a robust finding due to uncertainty.
6-134	E-6-65	A	3	19			Suggest add after 'low-lying deltas' and 'low-lying atolls' (Robert Kay, Coastal Zone Management Pty Ltd)	Text deleted not a robust finding due to uncertainty.

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6-135	G-6-64	A	3	20	3	20	After Antarctica "and Greenland" could be added. (Government of Hungary)	Text deleted not a robust finding due to uncertainty.
6-136	E-6-68	A	3	21	3	21	To compensate for removing the phrase on line 17, change the end of sentence to say "magnitude or timing (I.e., centuries to millennia). (Michael MacCracken, Climate Institute)	Text deleted not a robust finding due to uncertainty.
6-137	E-6-69	A	3	23	3	23	I think it would very useful to stress that there are key uncertainties in regional projections. Although the very important first step to regional projections has now been taken, it is important that the public realises that great uncertainties exist in these projections and that we should expect significant improvement in future projections with significant changes in their predictions. (Bram Bregman, Netherlands Organisation of Applied Research)	Spatial scale uncertainty is mentioned in second bullet point. New bullet on regional uncertainties for precipitation projections added.
6-138	G-6-65	A	3	23	3	23	We propose to add a paragraph emphasising the uncertainties in regional projections. (Government of Netherlands)	Spatial scale uncertainty is mentioned in second bullet point. New bullet on regional uncertainties for precipitation projections added.
6-139	G-6-66	A	3	23	3	23	Additional key impacts uncertainties are the impacts with varying rates of climate change, interactions across impacts, adaptation responses, consistency with socio-economic assumptions with emissions and climate change scenarios and across impacts sectors, and residual impacts under stabilization and other mitigation policies. (Government of United States)	Rejected. Most of those points are addressed under 6.3 or covered under existing key uncertainties in 6.2 (eg scenario dependence).
6-140	E-6-70	A	3	23	4	14	As explained in my previous comment [TSU note: See Comment E-3-11-A], a recent emission scenario by M. Amann and co-workers gives qualitatively different projections for the emissions of NOx and CO than the corresponding SRES scenario. Based on the current legislation, the new emission scenario projects a decrease rather than an increase of the global emissions of NOx and CO during the 21st century. This has important consequences for the indirect radiative forcing exerted by these gases through their impact on methane and tropospheric ozone. Simulations with a chemistry transport model using this new emission inventory show an increase of the atmospheric methane lifetime by 2.8-16.7% between 2000 and 2050, depending on the assumed change in the methane concentration (either zero or +600 ppbv). The studies quoted in WGI 7.4 have not used this new emission scenario. In particular Stevenson et al. (2006) estimate only a modest increase of 2.7% due to emission changes (a.o. increasing NOx) between 2000 and 2030 based on an ensemble of 25 model simulations (in which methane increases by 330 ppbv). I therefore propose to include as a key uncertainty the future changes in the emissions of air pollutants such as NOx and CO and their impact on the evolution of ozone and methane. (Twan van Noije, Royal Netherlands Meteorological Institute (KNMI))	Agree this is an uncertainty, but this uncertainty is much smaller than other key uncertainties such as clouds.

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6-141	E-6-71	A	3	23	4	14	A key uncertainty for climate scientists is that they have no clue about the political willingness to tackle climate change. So far, it is more talking than taking actions. We don't even know whether the A1FI scenario is really the upper end or if another 'more realistic' scenario should be included which follows the enhanced emission rates of the recent past... Somewhere in the section on key uncertainties, it should be possible to find a hint, that also politics contributes to uncertainty (more than the line on page 5, line 30). (Gian-Reto Walther, University of Bayreuth)	This uncertainty is included in the scenarios used.
6-142	E-6-72	A	3	25	3	25	The opening phrasing makes things sound much worse than they are. With the climate sensitivity being 2 to 4.5 C per doubling--or better said as, say, 3.25 plus or minus 1.25, we really have a quite good handle on the climate sensitivity and should not casually be saying things are uncertain. We have quite high confidence the sensitivity is in this range, and, as indicated in the scenario runs, for the next 50 years, there is little difference based on scenario or climate sensitivity--so we know a great deal. As phrased, this sentence will be pulled out and cited by Skeptics and reluctant leaders--do not set this up for that. Rewrite. (Michael MacCracken, Climate Institute)	Reject. Approved WGI SPM language.
6-143	E-6-73	A	3	25	3	28	Again it is crucial to mention global change effects (land-use change, insects, ecosystem degradation through overexploitation etc.) on biosphere and its current C sequestration service. The mere reference here to WGI assessments is unbalanced and does not consider the WGII findings from chapter 4. I refer again to 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. (Andreas Fischlin, Integrative Biology - Systems Ecology)	Carbon feedbacks reference to WGII 4.4 added to the second uncertainty bullet point..
6-144	E-6-74	A	3	30	3	35	This paragraph sounds as if it is talking about uncertainties in addition to those in the preceding paragraph, but it is not--it is these terms that are the cause of the range of estimates of climate sensitivity. So, the paragraphs need to be melded together so as to really not make things sound so uncertain here. (Michael MacCracken, Climate Institute)	Rejected Only cloud feedbacks included in climate sensitivity.
6-145	E-6-75	A	3	33			In Topic 6, "Key Uncertainties", it took me a while to locate the caveat regarding regional precipitation disagreement, page 3 line 33, since it consists of a single parenthesis "(e.g. precipitation)". At the same time aerosol impacts get their own paragraph lines 37-39, even though their importance to hydrological cycle impacts is secondary. I suggest abbreviating aerosol impacts into half a sentence attached to the first paragraph of this section, line 28. And expanding the parenthesis pg5, line 33 to "(e.g. precipitation, for which agreement has been obtained on a few large-scale aspects but remains highly uncertain at the regional level required for assessing impacts.)". (J. David Neelin, UCLA)	Text seems clear. New bullet on regional uncertainties for precipitation projections added.
6-146	G-6-67	A	3	37	3	37	Instead of "the hydrological cycle" write more understandably "especially the cloud and precipitation formation". By this one would also acknowledge the advance in knowledge about the radiative effects of aerosols, to some extent.	Accepted. Text added.

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							(Government of Hungary)	
6-147	E-6-76	A	3	37	3	38	I certainly agree, but it is interesting that aerosols barely managed a mention in the rest of the synthesis report. A particular uncertainty here, which is also relevant for understanding past climate change, is the aerosol-cloud forcings - the first indirect effect is poorly known - other effects (second indirect, semi-direct, ice phase impacts) are even more poorly known - maybe this should be mentioned in Section 6.1 as a key uncertainty? Until we have a robust time history of radiative forcings, attribution will always have some significant uncertainties - by failing to mention the uncertainties in radiative forcing histories, Section 6.1 is missing something significant - there is quite a large parameter space of possible climate sensitivities and possible radiative forcings that can give good agreement between observed and modelled changes in temperature. Hence it is wrong to imply that uncertainty in climate sensitivity is an issue only for future climate change. (Keith Shine, University of Reading)	Rejected due to space limitations. Too detailed.
6-148	E-6-77	A	3	37	3	38	Again, things are not so totally uncertain--we do have some integral constraints, etc. and we have some plausible ranges--it is inviting misuse of the IPCC results by making the phrasing as it is. (Michael MacCracken, Climate Institute)	Rejected Our assessment is that aerosols are a key uncertainty.
6-149	G-6-68	A	3	37	3	38	Comparison of Figure 3 from the TAR WG 1 SPM and Figure SPM.2 from the AR4 WG 1 SPM suggests that aerosol-related uncertainties have been reduced.If this is correct, the sentence should be changed to "Uncertainties regarding the impacts of aerosols on the magnitude of the temperature response and the carbon cycle have been reduced since but are still significant." (Government of European Community)	True,Comment is correct, but aerosols remain a key uncertainty and this statement involves more than radiative forcing.
6-150	E-6-80	A	3	40	3	40	"and Antarctic ice sheet mass, particularly..." (Michel J. Rossi, Ecole Polytechnique Fédérale de Lausanne)	Accepted.
6-151	E-6-81	A	3	40	3	40	"ice sheets mass" should be 'ice sheet mass' (Jon Egill Kristjansson, University of Oslo)	Accepted.
6-152	E-6-78	A	3	40	3	42	While the statement is roughly true, this major source of uncertainty is not even included in the estimates of sea level rise given in the tables and often pulled out as an indication of how much sea level will rise.. No where in the tables on sea level rise does it make the comment that this is the major source of uncertainty--instead this is dismissed as simply a term not being included. The phrasing used here should be highlighted everywhere numerical values of sea level are given--what we have a sense of is how much change has occurred in the past, and the amount is much larger than the terms being considered. (Michael MacCracken, Climate Institute)	Noted.
6-153	E-6-79	A	3	40			Change "Greenland and Antarctic ice sheets mass" to "masses of the Greenland and Antarctic ice sheets".	Accepted. Wording changed.

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							(Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	
6-154	E-6-82	A	3	41	3	41	need to explicitly point out that the ice sheet uncertainties are essentially one sided - i.e. they can lead to a significantly larger sea level rise but are not likely to lead to a small sea level rise (John Church, CSIRO)	Accepted. Text added.
6-155	E-6-83	A	3	45	3	47	Sentence would read better if the following changes are made: insert "reliably" before "because", insert "of" after "because" and delete "make the assessment of level of confidence difficult" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Accepted
6-156	G-6-69	A	3	45	3	47	It is not correct that large-scale ocean changes beyond the 21st century cannot be assessed. Such assessments have been made. Text should be changed to "Confidence in the assessment of large-scale ocean circulation changes beyond the 21st century remains low because...". (Government of European Community)	Text edited.
6-157	G-6-70	A	3	49	3	49	"Projections" of what? Please clarify. (Government of European Community)	Accepted
6-158	E-6-84	A	3	49	4	4	The section may also include the statement about the future images of societies and technological changes. In [WG3.3.2], there are statements about uncertainties of future scenarios: 'In summary, available evidence indicates that the differences between projected emissions using MER exchange rates and PPP exchange rates are small in comparison to the uncertainties represented by the range of scenarios and the likely impacts of other parameters and assumptions made in developing scenarios, e.g., technological change.' (Kainuma Mikiko, National Insititue for Environmental Studies)	The quoted sentence suggests that this is not a key uncertainty. Uncertainty of development pathways is discussed in 6.3.
6-159	G-6-73	A	4	1	4	1	Replace "improved understanding of" by "reducing the". The main source of uncetainty in climate sensitivity is the well understood difficulty in modeling small scale phenomena such as water vapor behavior. (Government of France)	Reject. Believe language is clear as it stands.
6-160	G-6-72	A	4	1	4	3	Suggest to give an order for the uncertainties according to importance or realm, then it would be clear to the key improvement. (Government of China)	Reject. No basis from the report on ordering.
6-161	E-6-85	A	4	1	4	4	It is important to add that the continuation of existing networks is also required and to emphasize the importance of long-term observations. (Sharon Smith, Geological Survey of Canada)	Reject. "enhancements" included maintenance of systems.
6-162	G-6-71	A	4	1	4	4	This should also refer to uncertainties in expected emissions paths. The reference in Topic 6 pg 5 lines. 21-24 sufficient doesn't seem sufficient. (Government of Canada)	Reject. "scenario" covers the emissions path.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
6-163	G-6-74	A	4	2	4	2	Add between "benefit from" and "enhancements in networks ..." improvements of the modeling tools and" (Government of France)	Models covered elsewhere.
6-164	G-6-76	A	4	6	4	6	Instead of writing some climate events please mention which climate events (Government of India)	Text deleted. Key points in following paragraph.
6-165	E-6-87	A	4	6	4	7	Make specific mention of the potential melting of Greenland and ocean acidification--this is just too vague. (Michael MacCracken, Climate Institute)	Text deleted. Key points in following paragraph.
6-166	G-6-75	A	4	6	4	7	What are possible "large impacts and irreversible changes"? Without examples, this is too vague. Are we concerned about extinction of homo sapiens? Shut down of global agricultural productivity? Biblical scale flooding? ... (Government of United States)	Text deleted. Key points in following paragraph.
6-167	E-6-86	A	4	6	4	8	There is in the write up here the feeling that the science community has a good idea what the "unknowns" might be and are just improving the predictions to make them better. Since our models can not predict the evolution of our climate even in the Holocene , this would be a wrong impression to give. Granted the shut down of the thermohaline subsidence seems unlikely , there have been very significant climate shifts in the Holocene that are not at all understood. For example the shift in ENSO around 4000 BP , has not been explained or modelled. Models have been able to simulate what they have already been told has happened. In fact they have yet to actually predict anything on their own. (David Fisher, NRCan)	Text deleted. Key points in following paragraph.
6-168	E-6-88	A	4	6	4	8	Give examples which ones (Markus Erhard, European Environment Agency)	Text deleted. Key points in following paragraph.
6-169	E-6-89	A	4	6	4	8	Examples of such climate events would be helpful here. (Martin Welp, University of Applied Sciences Eberswalde)	Text deleted. Key points in following paragraph.
6-170	E-6-90	A	4	7			"but" should read "and" (there is no conflict between these two statements) (Leonard Allen Smith, London School of Economics)	Text deleted. Key points in following paragraph.
6-171	E-6-91	A	4	10	4	13	This really is overstating the situation--or at least putting forth a theoretical formulation that is never followed. If we really needed a thorough understanding we would never make any decisions at the national level--politicians know how to deal with uncertain information. If thorough understanding is required to act, there will never be any action on this issue if reliance is on risk-based approaches--decisions will have to be made with imperfect information. And, of course, there is a whole school of thinking that doing a cost-benefit type of analysis is inappropriate given the importance of the problem and impossible given its complexity and the different value systems of different nations.	Text simplified.

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							(Michael MacCracken, Climate Institute)	
6-172	E-6-93	A	4	10	14		"require" is false. Risk based approaches to decision making benefit greatly from quantitative probability distributions functions if those distributions are of sufficient quality to make them decision-support relevant. But risk based approaches can also be applied in the absence of such numbers. The statement as it stands appears to imply that we have to wait until we have such numbers before we can act; this is not the case. Can the wording be changed so that the value of quantitative decision-relevant probability information is still reflected but risk management is not made to appear impotent in the absence of such information? (Leonard Allen Smith, London School of Economics)	Accepted. Text simplified.
6-173	E-6-92	A	4	10			Change "understandings" to "understanding" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text modified.
6-174	E-6-94	A	4	11			Insert "Higher-impact" before "events". Low probability events are only of significance in risk analysis if they have high impact. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text modified.
6-175	G-6-77	A	4	13	4	13	Replace the word "For" by "to be taken into account for" . Decision making is always made in an uncertain context, it may be be somewhat arbitrary but the decision taken is what it is. (Government of France)	Text modified.
6-176	G-6-78	A	4	16	4	16	There is concern with the manner in which the authors have mixed mitigation and adaptation; adaptation is a response, and mitigation is a way of avoiding the damages. Both reduce the effects of climate change, but they are not both responses to climate change (mitigation is a response to the prospect that climate will change). This is a problem in Topic 4 as well. (Government of United States)	Rejected. This is consistent with the parallel approach to adaptation and mitigation as agreed by governments in topic 4.
6-177	E-6-95	A	4	16			I don't like the title or the manner you have mixed mitigation and adaptation, adaptation is a response, mitigation is a way of avoiding the damages. Both reduce the effects of climate change but they are not both responses to climate change (mitigation is a response to the prospect that climate will change). I feel this is a problem in topic 4 as well (Bruce McCarl, Texas A&M Univesity)	
6-178	E-6-98	A	4	20	4	20	Insert 'a' between 'as' and 'response' (David White, ASIT Consulting)	Text modified.
6-179	G-6-79	A	4	20	4	20	The authors need to confirm that more adaptation has been "projected" rather than simply planned for, or expected. (Government of Australia)	Text modified.

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6-180	E-6-99	A	4	20	4	21	Change "is projected as" to "will be forced in" because we know further change will occur even with no further emissions. (Michael MacCracken, Climate Institute)	Text modified.
6-181	E-6-101	A	4	20	4	21	"limited adaption" - what does this refer to? Human activities? Natural ecosystems? (Janice Lough, Australian Institute of Marine Science)	Acc: "limited" deleted
6-182	E-6-96	A	4	20	4	30	The text on robust findings on adaptation is disproportionately weak in comparison to text on mitigation in the same subsection (from line 32, p. 4 onwards). Moreover, it does not compare well with text on adaptation earlier in the SYR. An effort should be made to strengthen the text. For example, the argument about high benefit-cost ratio of many adaptations could be made here: it would both be based on earlier discussion on adaptation and be comparable with mitigation arguments that follow. But other changes aiming to strengthen the sections would be needed as well. (Jouni Paavola, University of Leeds)	Rejected. Not supported by underlying chapters
6-183	E-6-97	A	4	20			Please add ref to WGII 20.5 as disaster risk reduction activities are relevant and important examples of ongoing adaptation. (Silvia Llosa, International Strategy for Disaster Reduction)	Accepted
6-184	E-6-100	A	4	20			Change "as" to "in" (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Noted: text has been deleted because of other comments
6-185	E-6-102	A	4	21	4	21	Change to read "More extensive proactive adaptation will be required to reduce vulnerability ..."--there will be lots of adaptation occurring that is reactive--what is being referred to here is proactive adaptation. (Michael MacCracken, Climate Institute)	Rejected: use of the term proactive would be too limiting
6-186	E-6-103	A	4	21	4	22	Change "the projected climate change" to "the climate change that is projected". Maybe "in the absence of mitigation" could be added at the end of the sentence, if that is the message this sentence is intended to send. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Noted: sentences have been changed because of other comments
6-187	G-6-80	A	4	25	4	26	This sentence is poorly written. "less feasible" than "infeasible" is certainly not what is meant. The vulnerability beyond the next several decades depends on the policies in the next two decades. This should be clearly stated. (Government of France)	Accepted: sentence has been rewritten
6-188	G-6-81	A	4	25	4	26	For consistency with the WG2 SPM suggest that this sentence is replaced with the following: "However, adaptation alone is not expected to cope with all the projected effects of climate change, and especially not over the long run as most impacts increase in magnitude". (Government of Australia)	Accepted: sentence has been rewritten

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6-189	E-6-104	A	4	25	4	27	The evidence of the description of "(...) adaptation will be (...) very costly in most cases" should be shown. Adaptation might be cheaper than mitigation in many cases. Otherwise, it should be changed to "(...) adaptation will be infeasible and very costly in some cases and less feasible in most cases." (Keigo Akimoto, Research Institute of Innovative Technology for the Earth)	Accepted: sentence has been rewritten
6-190	E-6-105	A	4	25	4	27	Here is an important message to put right up front--it is critical. (Michael MacCracken, Climate Institute)	Noted, with thanks. Wording changed without change in meaning.
6-191	E-6-106	A	4	25	6	25	"unfeasible" rather than "infeasible" (Janice Lough, Australian Institute of Marine Science)	Noted: sentence rewritten
6-192	E-6-107	A	4	29	4	29	maybe replace "could" with "is likely"? (Janice Lough, Australian Institute of Marine Science)	Deleted, now covered in revised preceding bullet.
6-193	G-6-82	A	4	29	4	29	"could" is ambiguous. (Government of United States)	Deleted, now covered in revised preceding bullet.
6-194	E-6-108	A	4	32	4	35	MK Jaccard & Associate has recently provided specific recommendations to the Canadian Federal Government on the cost that should be assigned to carbon over the next 1/2 century to achieve a specified reduction and the projected impact on GDP- probably to late for the 4th assessment report but potentially useful next time. The report is dated January 16, 2007 and is titled Cost Curves for Greenhouse Gas Emission Reduction in Canada: The Kyoto Period and Beyond. (Ian Church, Yukon Government)	Rejected, not appropriate to add new literature.
6-195	E-6-109	A	4	32	4	35	Is this all still true as the dollar drops in value relative to other currencies? (Michael MacCracken, Climate Institute)	Rejected, All costs in the WGIII report are in yr 2000 US\$, unless indicated otherwise
6-196	G-6-83	A	4	33	4	33	To make it clear that a suite of mitigation options will be needed to reduce emissions below current levels suggest that "with the" is replaced with "which, together have". (Government of Australia)	Rejected; current text considered clear by the authors
6-197	E-6-110	A	4	33			"with the economic potential at costs from net negative to 100US\$/tCO ₂ -equivalent" reads awkwardly to a non-economist, and the sentence as a whole is rather long and difficult to read, as the long qualifier "sufficient to offset ..." that is placed at the end of the sentence refers presumably to the "wide range of mitigation options" that opens the sentence. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Rejected: SPM wording has been used
6-198	E-6-111	A	4	34	4	34	Would it be correct to replace "or" with "and even"? (Markku Rummukainen, Swedish Meteorological and Hydrological Institute (SMHI))	Rejected: SPM wording has been used
6-199	E-6-112	A	4	35	4	35	After "over the coming decades", the following sentence should be added; ", if calculated at the global least cost approach .(Topic 5)"	Rejected: SPM wording has been used

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							(Mitsutsune Yamaguchi, The University of Tokyo)	
6-200	E-6-114	A	4	37	4	37	Add: "...deployment of a MITIGATION portfolio of technologies..." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Rejected: SPM wording has been used
6-201	E-6-113	A	4	37	4	43	This paragraph is repeated in Topic 5 page 9 lines 27-34 almost textual. Maybe need more redaction in this Topic that is as a Chapter of Conclusions. (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Rejected: SPM wording has been used
6-202	E-6-115	A	4	38	4	39	"the" needs to be inserted between "in" and "coming decades" (Jon Egill Kristjansson, University of Oslo)	Rejected: SPM wording has been used
6-203	G-6-84	A	4	42	4	42	Is it R&D or RD&D? (Government of United States)	Noted, it is RD&D
6-204	E-6-116	A	4	42			suggest change to 'and investments in AND TRANSFER Ofnew technologies' (Jon Barnett, University of Melbourne)	Rejected: SPM wording has been used
6-205	G-6-85	A	4	43	4	43	add after "decades" "but the lower are the risks of climate change". (Government of Germany)	Rejected: SPM wording has been used
6-206	E-6-117	A	4	45	4	47	"The lowest stabilisation scenarios (...) could over the longer term significantly reduce the risks of many major impacts on vulnerable systems" is an unclear sentence. I want to know whether the second (Category II) or third lowest (Category III) stabilisation scenarios could also reduce the risks of many major impacts on vulnerable systems significantly or not. Can only the lowest stabilisation scenario (Category I) reduce the risks significantly? (Keigo Akimoto, Research Institute of Innovative Technology for the Earth)	No, but suggestive of value associated with working hard.
6-207	G-6-86	A	4	45	4	49	It is strongly suggested to replace this paragraph with paragraph18 on page 22 of WGIII SPM. (Government of China)	Rejected. The current forumation says more.
6-208	G-6-87	A	4	47	4	48	Suggest saying "...global emissions would need to peak..." (Government of Canada)	Accepted
6-209	E-6-118	A	4				Uncertainties in natural variability over next decades (solar radiation, vulcanic activities) are also uncertain and per se unpredictable (Markus Erhard, European Environment Agency)	Does not meet definition of key uncertainty.
6-210	E-6-119	A	4				Table 6.1, second column, second paragraph, first sentence: adding a comma after "warming" and after "Atlantic" makes the sentence clearer. (Serge Planton, Météo-France)	Comment unclear, does not seem to refer to current draft.
6-211	E-6-120	A	4				Table 6.1, second column, fourth paragraph, third sentence: "consistent with stabilization" might be replaced by "for stabilization" and a comma might be added after "level".	Comment unclear, does not seem to refer to current draft.

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Running number	Topic - Comment	Batch	Page	Line	To Page	To Line	Comment	Considerations by the writing team
							(Serge Planton, Météo-France)	
6-212	G-6-88	A	4				Results concerning the range of the macro-economic costs of mitigation and their characteristics (uneven distribution by sectors and areas) could be also mentioned as well the direction of the impact of co-benefits on costs as robust findings. Please, state also that the market potential of the mitigation measures is typically much less than the economic potential. (Government of Finland)	Rejected; too much detail for section on robust findings
6-213	E-6-121	A	5	0			About the robust findings in 6.3 : As in the SPM of WG3 refers to the international mechanisms, it is recommended to include international achievements related to sentences such as 'Notable achievements of the UNFCCC and its Kyoto protocol are the establishment of a global response to the climate problem, stimulation of an array of national policies, the creation of an international carbon market and the establishment of new institutional mechanisms that may provide the foundation for future mitigation efforts (high agreement, much evidence).', and 'The literature identifies many options for achieving reductions of global GHG emissions at the international level through cooperation.' [SPM WG3, sentence 25 & 26] (Kainuma Mikiko, National Institute for Environmental Studies)	Rejected: duplicates with Section 4.5
6-214	G-6-89	A	5	3	5	4	With respect to the phrase 'making development more sustainable ...' please describe what 'sustainable' is supposed to convey? Economic sustainability? Environmental sustainability? Cultural sustainability? (Government of United States)	Noted: terminology has been used in the SPM WGIII
6-215	G-6-90	A	5	4	5	4	It is suggested to describe "development path" in more detail, such as the low carbon economy or resource-conserving type, as well as consumption pattern. (Government of China)	Rejected: too detailed
6-216	E-6-122	A	5	6			Please add ref to WGII 20.5 as disaster risk reduction policies are relevant to adaptation. (Silvia Llosa, International Strategy for Disaster Reduction)	Noted, but taken into account in earlier text in response to similar comment (6-183)
6-217	E-6-123	A	5	8	5	8	singling out multilateral development (a slightly vague term anyway) seems a bit odd - could change to 'international financial transfers' (Jon Barnett, University of Melbourne)	Accepted, deleted the term to simplify text
6-218	E-6-124	A	5	8	5	9	It might be useful to highlight some of the macroeconomic policies here (Richard Anyah, Rutgers University)	Rejected, too much detail
6-219	G-6-91	A	5	8	5	9	Suggest deleting " that seem ... climate change". (Government of China)	Rejected: the phrasing is correct
6-220	G-6-92	A	5	11	5	11	Additional key mitigation uncertainties include the implications of climate change feedbacks to mitigation potential (e.g., forest disturbances) and consistency in baseline	Rejected: not considered key uncertainties of the same level

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							and policy socio-economic scenarios with impacts and adaptation analyses. (Government of United States)	as other issues mentioned here.
6-221	E-6-125	A	5	11	5	30	The same relative inattention to and weakness of adaptation discussion is evident here, too. One issue obvious from the earlier text appears to be the costs of adaptation. Arguably, there is not a good understanding of costs associated with various adaptive actions, in part because there are so many of them. But this does not mean that such understanding cannot be developed. It may be an important next step for research and could be identified as such in the text. (Jouni Paavola, University of Leeds)	Accepted, added to text
6-222	G-6-93	A	5	12	5	12	The following should be added as key uncertainty: Limited and early analytical results only exist for integrated analysis of the costs and benefits of mitigation. These do not as yet permit an unambiguous determination of an emissions pathway or stabilisation level where benefits exceed costs. (Government of Australia)	Rejected: implied by the other key uncertainties mentioned here
6-223	E-6-126	A	5	13			Please change to present tense and add "variability" to "change". (Silvia Llosa, International Strategy for Disaster Reduction)	Accepted; text modified
6-224	E-6-127	A	5	15	5	15	"aggregated integrated vulnerability assessments" is not good expression (Antoaneta Yotova, National Institute of Meteorology and Hydrology)	Accepted. Text modified
6-225	G-6-94	A	5	15	5	15	What are "aggregated integrated vulnerability assessments"? Please clarify. (Government of European Community)	Accepted. Text modified
6-226	E-6-129	A	5	17	5	17	Change "Evolution of adaptive capacity and its realisation" to "Evolution of adaptive and mitigative capacity and their realisation". The same factors that govern adaptive capacity, govern mitigative capacity, neither should be singled out. (Robert Siveter, IPIECA)	Accepted. Text modified
6-227	G-6-95	A	5	17	5	17	The phrase "adaptive capacity and its evolution" is unclear and needs to be redrafted. (Government of Australia)	Accepted. Text modified
6-228	G-6-96	A	5	17	5	17	Change "Evolution of adaptive capacity and its realization" to "Evolution of adaptive and mitigative capacity and their realization". The same factors that govern adaptive capacity, govern mitigative capacity; neither should be singled out. (Government of United States)	Accepted. Text modified
6-229	E-6-128	A	5	17			To what does "its realisation" refer in the phrase "Evolution of adaptive capacity and its realisation". If "its" refers to "adaptive capacity" is this something that can be "realised". A word such as exploited or utilised might be more appropriate. (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Accepted. Text modified

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6-230	E-6-130	A	5	22	5	22	Add: "... technological change and PRODUCTION AND consumption patterns." (Cristobal Felix Diaz Morejon, Ministry of Science, Technology and the Environment)	Rejected: production patterns are implied in socio-economic
6-231	G-6-97	A	5	26	5	28	What is meant by "Valuations ... depend on spatial and temporal scales."? Please be more specific. (Government of European Community)	Text deleted for space reasons.
6-232	G-6-98	A	5	26	5	28	The authors need to complete the logic of this statement and explain that such assessments are, therefore, still highly uncertain. (Government of Australia)	Text deleted for space reasons.
6-233	E-6-131	A	5	27			Footnote could be deleted (Adrian Simmons, European Centre for Medium-Range Weather Forecasts)	Text deleted for space reasons.
6-234	E-6-132	A	5	30	5	30	This needs much more attention and explanation especially with regard to what non-climate policies means for the magnitude and range of change based of the existing scenarios. (Gian-Reto Walther, University of Bayreuth)	Rejected. Too much detail for this section