Chapter	From Page	From Line	To Page	To Line	Comment	Response
Topic 2	0	0			General comments on the Topic 2: Topic 2 is also need improvement on presentation and some minor changes to make this section more understandable and comprehensive for readers: messages and knowledge described in this section are not sufficiently developed across over the working groups. In addition, diagrams and figures are needs to be suit as lacking of comprehensiveness and balance over cross-cutting issues in Global and Regional sectors. [Government of Republic of Korea]	The request is for 'minor changes', but is not specific. We have striven to make all our figures, in particular, as synthetic as possible, and also simple and clear.
Topic 2	0				Since there are unceratinities and things that we don't fully understand, it is possible that there will be unexpected impacts. Perhaps this should be explicitly stated. [Government of Sweden]	The request us quite tentative 'perhaps…'. We have not specifically adressed it, but make it clear what the limits of prediction are
Topic 2	49	5	49	5	After carbon cycle include the following:The models are simplified, stylized representations of highly-complex, real-world processes, and the scenarios they produce are based on uncertain projections about key events and drivers over often century-long timescales. Simplifications and differences in assumptions are the reason why output generated from different models, or versions of the same model, can differ, and projections from all models can differ considerably from the reality that unfolds. [WGIII footnote 14). [Government of Bolivia]	The new boxes on methods, plus the treatment of uncertainty in the overall introduction, makes this point adequately without this specific text.
Topic 2	50	1	50	5	The information provided on this page is appreciated as it addresses topics that are important for the understanding of the report. However, it contains a confusing mixture between results (output) and a description of the scenarios used (input). Please restructure. In addition, the difference between scenarios, models, simulations and projections should become clear from the text as lay persons tend to confuse these. The information on different model types should be grouped. In particular: The paras starting in lines 26 and in 31 should be moved up (input). The para starting in line 26 is very similar to the one on drivers (only that here they are called "key factors") on P 38, please be more general here. [Government of Germany]	Page has been restructured. Introduction has been re-written. A Box has been introduced which redresses the "mixture" issue.
Topic 2	50	1	53	19	Overall clear and well written. [Government of Italy]	Thank you. No need for action.

Topic 2	50	1			Recommend adding some additional text to this section to describe the WGIII scenarios. While they feature in Figure 2.1 (and also in Table 2.2) there is only a very brief mention of these in the text in section 2.1. This is a fundamental challenge for the IPCC SYR, to describe these two sets of scenarios, why different scenarios were used/featured in the WGI and WGIII reports and how they relate to each other. Similarly, section 2.2 should be expanded to describe Integrated Assessment Models and how the WGIII scenarios are constructed. [Government of Canada]	Partly accepted. We have improved the introduction of both set of scenarios. However, we did not add a description of IAMs
Topic 2	50	3	50	11	Introductory part of Topic2: These lines are supposed to provide general information of the Topic 2, such as aim, key findings/messages and structure of the whole section. Please revise this part to be a proper introduction of the section. [Government of Republic of Korea]	Agreed. Introduction has been re-written to address this point.
Topic 2	50	5	50	5	ESMs simulate both climate and the carbon cycle. Word here, e.g. "that simulate also the carbon cycle" [Government of Sweden]	Agreed. "also" added. Relevant text now appears in Box 2.1.
Topic 2	50	5	50	5	It is perhaps disingenuous to imply that the only thing ESMs do is model the carbon cycle - they also generally model vegetation respons and other aspects of geochemical cycling and to claim that their one additional feature to GCMs is the carbon cycle therefore seems a little odd. [Peter Thorne, Norway]	True, but this is a synthesis report and so we do not present all the details. This is the single most important factor. Relevant text now appears in Box 2.1
Topic 2	50	5	50	5	Suggest revision. What does 'science-based' mean? Suggest more precise language such as, "based on well established physical laws and principles". [Government of Australia]	Term no longer used. Relevant text now in Box 2.1.
Topic 2	50	6	50	7	Change "Climate projection….Pathways" into "Scenarios of natural and anthropogenic forgings drive climate projections. The standard set for AR5 are the Representative Concentration Pathways (RCPs)l". [Government of Italy]	Agreed & adopted. Text now appears in Box 2.1.
Topic 2	50	7			I suggest to delete " the standard set for AR5 being the Representative Concentration Pathways (RCPs)" as this concept, which is a detail at the conceptual level of the paragraph, is only introduced in lines 32-34 [Government of Hungary]	This text now appears in Box 2.1, not in the introductory paragraph. Hence this issue no longer arises.
Topic 2	50	8	50	8	Replace "Impacts and risks are assessed" into "evaluated" (repetition of assess in the next line) [Government of Italy]	Text was restructured and this sentence no longer appears.
Topic 2	50	8	50	9	Why single out Integrated Assessment Models in this sentence? Suggest using text from IPCC WGII SPM Section A-3; 'Assessment of risks relies on diverse forms of evidence, including, for example, empirical observations, experimental results, process-based understanding, statistical approaches, and simulation and descriptive models.' Suggest deleting reference to WGII 19.2 here and adding it to the citations indicated in lines 10-11, which should also cover this sentence. [Stewart Cohen, Canada]	Agreed, however, after text was restructured this sentence no longer appears. The information provided is now provided in Box 2.1.

Topic 2	50	10	50	10	The abbreviation "SRES" is not explained. [Government of Sweden]	Acronym now provided.
Topic 2	50	13	50	13	The abbreviation of greenhouse gases, GHG, is given and used earlier. GHG should be used here for consistency. [Government of Switzerland]	This is a headline statement. Such statements will be read independently by some readers. Hence we have tried to avoid acronyms where we can in such statements. We therefore retain "greenhouse gases" in this instance.
Topic 2	50	13	50	15	Topic2-box: It is not clear this box is given as either key message of the whole section or the section 2.1 followed. As if it was later then please move the box into the section 2.1. Otherwise it would be better to put just below the section title rather than where it is now. [Government of Republic of Korea]	Agreed. Headline statement referred to here has been moved to very beginning of Topic 2.
Topic 2	50	19	50	19	"are used" into "help" [Government of Italy]	Rejct. Current text is more factual.
Topic 2	50	21	50	22	I realise it is difficult to word concisely, but there is a slight inaccuracy in saying the emitted CO2 remains, when it is really the perturbation that persists, in the long term [Keith Shine, United Kingdom]	Not relevant anymore. text has been removed.
Topic 2	50	22	50	23	"lifetime" may need explaining here for some readers. Alternatively, "decays…" [Government of Sweden]	Not relevant anymore. text has been removed.
Topic 2	50	23	50	23	"methane a decade" into "methane of a decade" [Government of Italy]	Not relevant anymore. text has been removed.
Topic 2	50	26	50	27	See my comment above to SPM page 10 line 26-27 [Harold Leffertstra, Norway]	Not relevant anymore. text has been removed.
Topic 2	50	26	50	30	Unsustainable production and particularly consumption patterns are important key factors for anthropogenic greenhouse gas emissions, as can be seen by comparing GDP and GHG emissions per capita between developed and developing countries. They should be mentioned in this section. [Pedro Alfredo Borges Landáez, Venezuela]	Rejected. More details on emissions are given in Section 3. Here, the scenarios are only briefly introduced.
Topic 2	50	27	50	27	"technology change" into "technological change" [Government of Italy]	Accepted. Change made
Topic 2	50	33	50	33	"changes and emission" into "changes, and emission" [Government of Italy]	Accepted. Change made
Topic 2	50	34	50	34	"are used as input" into "become inputs" (repetition of "used" in line 36) [Government of Italy]	Accepted. Sentence was changed
Topic 2	50	35	50	36	Along with WGII 19, suggest adding WGII 21. [Stewart Cohen, Canada]	Accepted. Sentence was changed
Topic 2	50	42			"aggressive mitigation" is not a neutral expression, please modify. [Government of Germany]	Changed to ambitions
Topic 2	50	43	50	45	"Many models indicate that meeting the RCP2.6 scenario will require substantial net negative emissions by 2100, in some cases of about 2 GtCO2/yr. {WGIII 6.3.2; WGI 6}" Would be useful to give a rough idea of what 'many' is in proportion to the number used. Some, half, most? [Government of United Kingdom of Great Britain & Northern Ireland]	Wording changed to emphasize that is actually most.

Topic 2	50	44	50	44	Negative emission amounts of 2 GtCO2 per year are mentioned here. Yet Figure 2.1a seems to show much larger negative emissions (like up to around -40GtCO2/yr). This apparent contradiction should be clarified. [Government of United States of America]	Wording changed to indicate that the average is around 2 GtCO2
Topic 2	50	44	50	44	Suggest clarify meaning of 'negative emissions'. [Government of Australia]	Agreed - footnote added
Topic 2	50	44			Land-use changes in the RCPs range from strong reforestation to further deforestation. This statement implies that reforestation is possible and may lead to a gross misunderstanding by policy makers of options that simply may not exist. Once again the IUFRO report, in tandem with research by Duke University (US), indicates that reforestation may be difficult at best as the temperature increases. [Harold David Tattershall, United States of America]	On the time frame considered by the published scenarios afforestation seems possible.
Topic 2	50	45	50	45	Suggest clarify to what scenario 'reforestation to further deforestation' applies. [Government of Australia]	Sentence has ben improved to not only communicate uncertainty.
Topic 2	50	46	50	46	Suggest clarify the meaning of 'air pollution' as it is open to many interpretations. [Government of Australia]	Reformulated
Topic 2	50	48	50	48	response of what? Suggestion: "response of temperatures" or "response of the climate system" [Government of Netherlands]	Sentence removed. text should be in different Section
Topic 2	50	48	50	48	I would replace a word "significant" with high or large, as significant is used for statistical results. [Government of Netherlands]	Sentence removed. text should be in different Section
Topic 2	50	48	50	48	"in the response" - I didnt really understand the point here - is it that uncertainty in how aerosol emissions will change, or in how those emissions changes will impact on burden or forcing? [Keith Shine, United Kingdom]	Sentence removed. text should be in different Section
Topic 2	50	49	50	49	here one could add a para explaining the use of MAGICC simple models in WG 3. It is missing in the whole document [Monika Rhein, Germany]	Reject. Necessary background information can be found in the underlying WGIII report.
Topic 2	50	52	50	52	Suggest adding “A1FI” next to "A2" by writing "A2/A1FI". CMIP3 seems to be mainly dealing with 3 SRES scenarios (B1, A1B and A2), and A2 is used instead of A1FI, with a smaller number of projections. However, Box1.1 in WGI states, “RCP8.5 is somewhat higher than A2 in 2100 and close to the SRES A1FI scenario”; thus, mentioning both would be more comprehensive. [Government of Japan]	Agreed. text has been changed
Topic 2	50	52	50	52	RCP6.0 should be equal to A1B. It is suggested, therefore, to reformulate “RCP6.0 to B2” as “RCP6.0 to A1B”. [Government of China]	text is correct. No change was made. RCP6 is close to B2 and A1b
Topic 2	50		50		Fig 2.1 - not very visible [Government of Italy]	Figure has been edited

Topic 2	50				Just like for Topic 1, I suggest a bit more detailed methodological description of how modelling is used for projections. This would be very much needed to understand the conclusion that current climate change is manily of anthropogenic origin, and to increase the credibility of the statements that refer to future. [Government of Hungary]	Description on models has been expanded
Topic 2	51	0	51	0	graph (a): add horizontal line at zero Gt/yr [Government of Netherlands]	Agreed is done.
Topic 2	51	0	51	0	graph b, c: if the coloured bar on the right of each graph represents "WGIII min to max range in 2100", add that text in each graph. [Government of Netherlands]	Agreed. Will be added in caption or legend.
Topic 2	51	0	51	0	graph a, b, c, d: write "/yr" or "per year" in stead of "yr^-1" (for clarity) [Government of Netherlands]	Needs to be checked by editor
Topic 2	51	0	51	0	graph e: start the y axis from zero [Government of Netherlands]	Panel will be removed
Topic 2	51	0	51	0	graph f: yellow text is unreadable, choose a different colour [Government of Netherlands]	Has been improved
Topic 2	51	1	51	1	the individually numbered panels in the figure needs more caption text. Panel f i very difficult to read, especially the yellow color is a challenge. The legends within panel a and b are relevant for most of other panels; seems strange to place them only there. Either they should be below or besides all the panels, or they should be repeated for all relevant panels. [Government of Denmark]	Figure has been updated made more accessible.
Topic 2	51	1	51	1	Figure 2.1, panel f: The yellow text (and associated bar) needs to be a different color. Or add background to the graph so that the yellow text can be read more easily. [Government of United States of America]	Done
Topic 2	51	1	51	7	Fig 2.1: some (all?) panels also show the ranges of "scenario categories", however these are not defined till table 3.1 on page 76, and there is no reference here for that table. Furthermore, in table 3.1 these categories are not labeled Cat 1, Cat 2, etc…so it is unclear what each category represents [Government of Netherlands]	Agreed. We have now made a reference
Topic 2	51	1			Figure 2.1: Recommend a line be drawn across the graph in panel (a) at the zero emissions level. This will help draw the reader's attention to the fact that the pathways for CO2 emissions include negative emissions. More generally, we are glad to see this detailed information about the various scenarios presented in the SYR. [Government of Canada]	Agreed.
Topic 2	51	1			Figure 2.1: The integration of information from WG2 and WG3 is appreciated, but the caption should better explain how this was done. (The legends are too small, figure titles would be useful.) [Government of Germany]	Both graph and caption were improved
Topic 2	51	2	51	7	Figure 2.1: suggest to explain why it is necessary to apply two types/groups of scenarios (RCPs and "WGIII" scenarios), and what the differences are [Government of Hungary]	Caption has been improved to capture this comment

Topic 2	51	3	51	3	Footnote 10: "There is generally no connection between…" should be explained better. [Government of Sweden]	Footnote has been shortened and connected to the glossary
Topic 2	51	3			Footnote on Equivalent carbon dioxide emissions: The first sentence of the footnote seems incorrect. Equivalent CO2 is derived based on GWP_100 which itself if defined based on infinitesimal pulse emissions on a specified background atmosphere. Therefore unless the emissions concerned are infinitesimal pulse emissions with the same background atmosphere it will not generally be true that the CO2 equivalent emission is the amount of CO2 which would give the same radiative forcing over a specified time horizon as a basket of emissions. Note that CO2 radiative forcing is logarithmically dependent on CO2 concentration. Suggest reviewing. [Government of Canada]	Footnote has been shortened and connected to the glossary
Topic 2	51	3			Footnote 10: This footnote comes too late for the emission-metrics. Please move to the first reference of CO2eq, that is Figure SPM.3.2. [Government of Germany]	Footnote has been shortened and connected to the glossary
Topic 2	51	5	51	5	Please specify "simple carbon cycle / climate model MAGICC" as it is more informative than"simple MAGICC". Cf, for example, footnotes to Table SPM.1 in WGIII SPM. "Simple" is in relation to more complex models, not necessarily "simple" in an absolute sense. [Government of Sweden]	Agree, Done in Topic 2 Text
Topic 2	51	5	51	5	MAGICC-6: MAGICC-6 or MAGICC6? there are various spellings in the SYR, and WGI includes "6" only in the reference list [Lena Menzel, Germany]	Agree
Topic 2	51	5	51	7	Chart (e) on Figure 2.1 does not directly show emissions/removals/forcing pathways, rather, paths of a particular activity pathway (and "land use" in itself is not a sink pathway), whereas CO2 etc. emission pathways are not an activity pathway. Suggest to only include chart (a) in the Figure, and explain in the text the assumptions behind each scenario. All other details are only important for the actual modelling excercise. [Government of Hungary]	Figure was significantly imporved. Land use panel was removed
Topic 2	51	9	51	18	This para should be moved to another section (e.g. 2.5). Section 2.1 should only consider what its title suggests. [Government of Hungary]	The title of this section has been revised to better encompass its contents, including this paragraph.
Topic 2	51	9	51	18	Section 2.1 is titled Drivers and Scenarios of Future Change in Climate, but this paragraph is about how alternate development paths influence vulnerability and exposure which in turn influence climate related impacts. Suggest it doesn't belong in Section 2.1, especially since the new scenario process has not yet produced alternate development paths consistent with the RCPs. [Government of Canada]	The title of this section has been revised to better encompass its contents, including this paragraph.
Topic 2	51	13	51	13	"Understanding" into "to understand" [Government of Italy]	This sentence has been deleted.

Topic 2	51	13	51	17	The authors proposed the socioeconomic factors (i.e. wealth and its distribution across society, patterns of aging, access to technology and information, labour force participation, the quality of adaptive responses, societal values, and mechanisms and institutions to resolve conflicts) for better understand on vulnerability of future society to climate change. Although they mentioned the institutional approach at the end, the capacity and the will of public sector or government to control mitigation and adaptation to climate change are critically important, and it may need to be emphasized separately. As Professor Jared Diamon wrote in his book, Collapse, the main factors leading a civilization to collapse include 'population growth' and 'human impacts on the environment'. But the more important factor is 'the responsibility of the leader of the society', which can be interpreted as 'public sector' or 'government' in modern society. The authors pointed out the institutional factors in the line 22 of the page SYR-66, i.e. 'For most economic sectors, the impacts of changes in population, age structure, income, technology, relative prices, lifestyle, regulation, and governance are projected to be large relative to the impacts of climate change.' [Young-june Choi, South Korea]	This sentence has been deleted.
Topic 2	51	15	51	15	Long sentence. Rewrite "be considered, including" as "be considered. These include.." [Government of Italy]	This sentence has been deleted.
Topic 2	51	18	51	18	Suggest adding: 29.3, 29.4, 26.1, and Table 29-4 as additional supporting Chapter rerferences [Government of United States of America]	The references provided are more centrally relevant to the findings presented here.
Topic 2	51	20			Title 2.2 suggests details on how models are created and used, however, what is mainly discussed is improvements since AR4. These are different issues. Also, climate models are not only used to make projections but also to understand the climate system, for which modelling the historical climate is very important. Therefore, it is suggested that the title is changed accordingly, and that the entire section is moved up maybe to create Topic 0 where all issues o methodology, uncertainty as well as the "IPCC method" are described (see my related comments elsewhere). [Government of Hungary]	Text has been restructured. The section on climate models and advances in climate models and sea level projections has now been moved to a new Box (Box 2.1). Given the brevity of the Box, and the very tight word limits, we don't think subheadings for "advances" are necessary. It is true that climate models can be used to improve understanding of the climate system. However Topic 2 is specifically focussed on projections.

Topic 2	51	22	51	22	this headline singles out the model improvement for sea level rise.. However, in the bold statement about model improvements on page 52, lines 10-13, sea level is not mentioned as one of the main improvements. [Monika Rhein, Germany]	The first sentence has been revised and the second sentence has been removed. The remaining sentence appears as a headline statement in Box 2.1.
Topic 2	51	22	51	23	By identifying only sea level rise in the second sentence of this headline, it suggests that there will be greater emphasis or more confidence given for statements about sea level rise in section 2.2. Suggest deleting this sentence from the headline. [Stewart Cohen, Canada]	This sentence no longer appears in a headline statement. The issue of confidence in SL projections now appears in Box 2.1. It now says: "The ability to simulate ocean thermal expansion, glaciers and ice sheets and thus sea-level has improved since the AR4, but significant challenges remain in representing the dynamics of the Greenland and Antarctic ice sheets. Advancement in sea-level modelling and in scientific understanding and capability has nevertheless resulted in higher confidence in projections of sea level since the AR4 report. {WGI SPM, 7.3, 7.6, 9.1, 9.2, 9.4, 9.6, 9.8} "

Topic 2	51	22	51	23	Please reconsider stating, "In particular, confidence in projections of sea level rise has increased." The current description could be misleading and seems unbalanced when considering facts below. This is a headline statement and thus likely to be taken out and referred by itself in the future. FYI: The first bullet in Section E.6 on page 23 of WGI SPM says, “Confidence in projections of global mean sea level rise has increased since the AR4 because of the improved physical understanding of the components of sea level”; however, 13.8 (p. 1205, 3rd para) of the underlining report also says “Despite this progress, significant uncertainties remain, particularly related to the magnitude and rate of the ice-sheet contribution for the 21st century and beyond…” Also 2.2.1 on the 2nd para (SYR-52, L16-18) says “The ability to simulate … sea-level has improved since the AR4, but significant challenges remain in representing the dynamics of the Greenland and Antarctic ice sheets,” and confidence level is not indicated. [Government of Japan]	Agree. The second sentence in headline statement has been removed. The isue of confidence in SL projections now appears in a new Box (Box 2.1). It now says: "The ability to simulate ocean thermal expansion, glaciers and ice sheets and thus sea-level has improved since the AR4, but significant challenges remain in representing the dynamics of the Greenland and Antarctic ice sheets. Advancement in sea-level modelling and in scientific understanding and capability has nevertheless resulted in higher confidence in projections of sea level since the AR4 report. {WGI SPM, 7.3, 7.6, 9.1, 9.2, 9.4, 9.6, 9.8}
Topic 2	51	22	51	23	Second sentence is contradicting the first sentence.The sentence seems to suggest that confidence in projection of other parameters like temperature has not increased which may not be the case . [Government of Kenya]	Agreed. The sentence has been deleted. The issue of increased confidence in SL projections is now covered in Box 2.1.
Topic 2	51	22	52	18	The headline statement on P 51 does not seem fully consistent with the statement on P 52 L 16-18. [Government of Germany]	The headline statement, which now appears in Box 2.1, no longer singles out sea-level. Increased confidence in sea-level projections is provided elsewhere in Box 2.1 in standard text.
Topic 2	51	22			Suggest deleting 'In particular'. [Government of Canada]	This sentence has been deleted. The information is now provided in Box 2.1. "in particular" is not used.

Topic 2	51	23	51	23	In footnote 10, 3rd line from bottom "mix of different greenhouse gases" should be "mix of different forcing agents" because it was just mentioned that GWPs can intermix GHGs and e.g. aerosols. [Government of United States of America]	This footnote no longer appears in this form. It is replaced by footnote 11 CO2-equivalent (CO2eq) concentration is a metric for comparing radiative forcing of a mix of different GHGs and aerosols at a particular time (see Glossary).
Topic 2	51	28			Are "numerical experiments" meant? [Government of Germany]	It can include numerical experiments, but also physical experiments.
Topic 2	51	30	51	32	Please remove the sentence on specific experiments, this information is not helping those who have never heard of them, i.e. most of the readers of the SYR. [Government of Germany]	Specific experiments are no longer given
Topic 2	51	31		49	In figure 2.1 , the side legends are unreadable [Government of Costa Rica]	The figure has been redrawn and is now legible.
Topic 2	51	43			Please explain the statement that "Models... are not independent of the value judgements, world views, or preferences of the modeller.". [Government of Germany]	This statement has been removed
Topic 2	51		51		Figure 2.1e. What are the coulours? [Government of Sweden]	The colours are now explained in the legend and caption
Topic 2	51		51		Note 10 - full stop missing at the end of the second paragraph [Government of Italy]	Corrected
Topic 2	51				Footnote 19: the statement "There is generally no connection between equivalent carbon dioxide emissions and resulting carbon dioxide concentrations" is self contradictory - if something results from something else, that is in itself a "connection". Please reword to explain more clearly what is meant here. [David Wratt, New Zealand]	This footnote no longer appears in this form. It is replaced by footnote 11 CO2-equivalent (CO2eq) concentration is a metric for comparing radiative forcing of a mix of different GHGs and aerosols at a particular time (see Glossary).
Topic 2	51				Figure 2.1: The caption as well as the text in chapter 2.1 lacks any clear description about meaning of the WG III scenario categories 5-95%. Furthermore no explanation is provided for the obviously arbitray selection of ranges. Until now the IPCC did not make any assessment on the likelihood of any of the scenarios assessed and it explained why this is beyond what science can deliver because it depends on human decisions. Further explanation is required. [Government of Austria]	The figure has been completely redrawn and has a new caption

Topic 2	51				footnote 10: last sentence - this sentence is far too strong. There is definitely more connection between equivalent carbon dioxide emissions and resulting equivalent carbon dioxide concentrations compared to other parameters such as global population, global GDP or global use of primary energy. A more appropriate wording might be: There is generally no simple and direct connection between equivalent carbon dioxide emissions and resulting equivalent carbon dioxide concentrations. [Government of Austria]	This footnote no longer appears in this form. It is replaced by footnote 11 CO2-equivalent (CO2eq) concentration is a metric for comparing radiative forcing of a mix of different GHGs and aerosols at a particular time (see Glossary).
Topic 2	51				Figure2.1 Labels extremely small and faint . Consider increasing font size slightly [Government of Kenya]	The figure has been redrawn and is now legible.
Topic 2	51				Footnote 10 The equivalent carbon dioxide emission is obtained by multiplying the emission of a greenhouse gas by its Global Warming Potential for the given time horizon. Given that it is known from the Paleoclimate record that the climate can whip-lash from one state to another, even within a season, at a minimum a disclaimer should be made to the use of GWP since that metric is based on spreading forcing from a given agent over 100 years. [Harold David Tattershall, United States of America]	This footnote no longer appears in this form. It is replaced by footnote 11 CO2-equivalent (CO2eq) concentration is a metric for comparing radiative forcing of a mix of different GHGs and aerosols at a particular time (see Glossary).
Topic 2	52	1	52	8	This para should be moved to P 50 L 3 as it provides a definition of models. [Government of Germany]	Agree that this was out of place. The description of models now appears in Box 2.1.
Topic 2	52	6	52	7	Examples of aspects of climate from climate models are listed but there is no biogeochemical variable. How about adding “carbon flux” for example? [Government of Japan]	The C-cycle is mentioned (now in Box 2.1). As we are very short on space and this document is for policymakers we have kept detail to minimum. Hence we have not adopted this suggestion.
Topic 2	52	10	52	19	There should be an objective evaluation of the performance of a climate system model. A case in point is the failure to reproduce the post-1998 slowing down warming pattern. It is suggested to add “However, there are differences between simulated and observed trends over periods as short as 10 to 15 years (e.g., 1998 to 2012). Natural internal decadal variability causes to a substantial degree the difference between observations and the simulations（medium confidence）” after “large volcanic eruptions (very high confidence)”. (from WGI SPM) [Government of China]	We now provide statements in Box 2.1 pointing out that the models are not perfect. The specific issue raised is addressed in Box 1.1
Topic 2	52	10	52	19	here improvements for sea level projections are not in the bold headline. [Monika Rhein, Germany]	This paragraph is now in Box 2.1, and SL is now mentioned.

Topic 2	52	10	52	19	State key factors that are still missing or inadequately accounted for in models: Albedo reparametrerization in the Arctic, change in Bowen ratio over Arctic sea ice, bathymetry effects,warm river discharge effects, etc. [Government of United States of America]	As this report is for policymakers and not scientific specialists we have not gone into details. However, this comment did help to flag the issue that we should point out that the models remian imperfect. This is now done in a headline statement in Box 2.1.
Topic 2	52	13	52	13	Suggest additional text A more detailed statement on rainfall changes and monsoon changes is required. [Government of Australia]	Unfortunately we do not have space to accommodate all suggestions for more details. We currently provide a map of projected precipitation change and a section dedicated to the water cycle. This includes a paragraph on projected changes in precipitation, another on extreme predcipitation, and another dealing with the monsoon. We also [provide references to relevant sections in the more detaileds underyling reports. We therefore think, given the tight constraints on space and the nature of this Synthesis Report, that this coverage is satisfactory.
Topic 2	52	14			The meaning of 'over many decades' here is unclear. Does it mean over many individual decades, or on multi-decadal timescales? [Government of Canada]	text has been replaced with: "multi-decadal trends including"
Topic 2	52	15	52	15	Suggest additional text to reflect models' ability to represent precipitation (a critical evaluation). The text could read "models have significant and increasing skill in representing large scale features of rainfall, and its seasonal and interannual variation". [Government of Australia]	Agreed. Box 2.1 now states that:"The simulation of large-scale patterns of precipitation has improved somewhat since the AR4, although models continue to perform less well for precipitation than for surface temperature {WG1 9}. "

Topic 2	52	19	52	19	Earth System Models still rely heavely on parameterizations, particularly for the representation of moist convective processes in the atmosphere. Therefore, a more physically based representation of physical processes in the models (e.g. the phase changes of water vapor in the atmosphere and tropical rainfall) are deemed needed. [Government of Brazil]	As this is a report for Summary for Policymakers we keep technical details to a minimum. However the fact that models are imperfct is important and is now made in Box 2.1. It states that: Climate and impact models have improved since the AR4, though they remain imperfect.
Topic 2	52	19	52	19	While somewhat crude biogeochemistry has been introduced into both continental vegetation and ocean models in CMIP5 models, the representation of the thermodynamics of self regulatory effects of life, both animal and vegetal, in the dymamics of tropical forests and the oceans are by-en-large missing in current state-of-the-art earth system models. [Government of Brazil]	As this is a report for Summary for Policymakers we keep technical details to a minimum. However the fact that models are imperfct is important and is now made in Box 2.1. It states that: Climate and impact models have improved since the AR4, though they remain imperfect.
Topic 2	52	25	52	25	unaccounted for sources … [Peter Thorne, Norway]	Grammatical point, accepted.
Topic 2	52	27	52	27	It is suggested to substitute "and" by "as in". [Government of Austria]	Accepted, makes no real difference to the meaning
Topic 2	52	27	52	46	This text presumably comes from WGII, but some impacts may be assessed from GCMs, such as sea ice melting for example, and the text may therefore be thought to apply to climate models too. The text could be generalized to apply to GCMs too. In particular the statement on lines 42-43 does not apply to GCMs but could be read as doing so. Suggest reviewing. [Government of Canada]	The point about this text needing to be general enough to cover all types of impact modelling is accepted, and we have rewritten it to ensure it does.
Topic 2	52	27	52	53	Suggest revision. Section is inconsistent with corresponding text in WGII SPM. Could use text in WGII SPM as it is more concise and objectively focused. (see WGII SPM p. 11 first paragraph) [Government of Australia]	We do not agree that it is inconsistent with WG2 SPM. That paragraph is specifically aimed at explaining the process of risk assessment. This one is more general, but covers the points relevant to risk assessment too.
Topic 2	52	28	52	28	"analogies and models" into "analogies, and models" [Government of Italy]	accepted and changed
Topic 2	52	33			constrains' should be 'constraints' [Stewart Cohen, Canada]	Accepted and changed
Topic 2	52	34	52	34	Please specify also here that the "projections" refer to climate impact studies, not climate change scenarios [Government of Sweden]	Accepted and done by adding '...of climate and impacts'

Topic 2	52	38	52	46	The section describing "models" is so vague here that the reader may be confused. Are we talking about GCMs? IAMs? Models used to assess societal impacts? [Government of United States of America]	The section is intended to be general, rather than specific, given that this is a very high level synthesis report where going into details would be inappropriate. However, we have added a few words to show the range of models covered.
Topic 2	52	39	52	39	"simulations of simplified systems" It's not clear exactly what this is referring to; specifically, the word "simplified" is puzzling. Certainly the models are simplified, but which "simplified systems" are being simulated? [Government of United States of America]	Fair point; we have rearranged the sentence to make it clear that models are simplifications of complex systems
Topic 2	52	48	53	18	These paras on risks and confidence should be removed here and be integrated into Box SPM.1 on P 29. In addition, they contain a confusing mixture of basic concepts for understanding and an arbitrary selection of results. Please restructure. [Government of Germany]	The material in FOD 2.3 has been redistributed to several places in the report, and in the process ectensively rewritten. There is now a box on risk in the overall introduction. We will only include in topic 2 what is necessary to develop further for the purposes of topic 2.
Topic 2	52	51	52	53	As written the text says that IPCC calibrated language is used in cases where the data are insufficient to allow a direct estimation of probabilities. However, likelihood language is based on direct estimation of probabilities. [Government of Canada]	This example has been removed
Topic 2	52				• Section 2.2.1 [P52] of SYR Models of Earth Systems does not refer evaluation of climate models as appeared in Approved SPM of WGI section D1 (p13). [Government of Saudi Arabia]	We are not sure what this statement is about. We suspect that it is seeking a statement saying that models are not perfect. The fact that climate models have improved in some important respects but that they remain imperfect is now stated in Box 2.1.
Topic 2	53	3	53	3	It is suggested to substitute "the last report" by "AR4" due to greater clarity (e.g. SREX was also a report before AR5). [Government of Austria]	Agreed. Done.
Topic 2	53	3	53	5	"While" (line 3) makes it seem that the "varies" (line 5) is a bad thing. Suggestion: "Relevant scientific … last report. {references} For different aspects of the future, there are different degrees of confidence in climate change projections and associated impacts." [Government of Netherlands]	Disagree as this disconnects logical connection between scientifc advancement and confidence in projections

Topic 2	53	3	53	18	Confusing paragraph. Is it better or worse than AR4? [Government of United States of America]	Advances made since the AR4 are now discussed in the new Box 2.2. A simple statement covering projections is not possible because the advancement depends very much on context. We have addressed this to the extent we can, based on material in the underlying reports.
Topic 2	53	6	53	6	"amount" unclear, remove it and leave "quality and degree of agreement" [Government of Italy]	Disagree. "Amount" is word used in official IPCC criteria.
Topic 2	53	9	53	17	It is good to explain the use of the uncertainty language, but the attempt here is not very well developed. This only cites a few uses, not how the statements should be understood/interpreted. Some other formulation should be considered here. [Government of Sweden]	Provision of examples is useful to an extent. Though we agree that examples given are rather arbitrarily chosen and not all vital. They have been deleted.
Topic 2	53	10	53	10	2 spaces after "there" [Government of Italy]	Agree, but text no longer appears after restructure
Topic 2	53	10	53	10	Suggest revision. Revise to read 'can be stated as a fact' (as this is describing an example, rather than the only case). and add the reason why this can be done, for example 'because of the extremely high level of scientific confidence, and the multiple lines of supportive evidence'. [Government of Australia]	Agree, but text no longer appears after restructure
Topic 2	53	10	53	14	It seems strange to mix a sentence talking about changes in sea level rise with temperature increases and food security. I think it would make more sense to separate these things. This comment might also apply to the following sentence. [Lisa Alexander, Australia]	This list was deleted as provision of list is not necessary to illustrate that degrees of confidence varies. Readers will see this soon enough. We now simply make this point withoput the list near the beginning of Section 2.2.
Topic 2	53	17	53	17	"regional scale [WGI 14]." into " regional scale. [WGI 14]", for consistency with the rest of the document. [Government of Italy]	Sentence no longer appears.

Topic 2	53	17	53	18	This absolutely has to be changed as it is not, at all, what happened. All of the confidence assignments: 1. Were made following the IPCC guidance, 2. Were based upon the assessed literature, 3. included an informed expert assessment based upon that literature. To state that the assessments were based on the 'opinions' of the expert authors is borderline libelous and not a reflection on the IPCC process. I am absolutely flabbergasted to be reading such words in an official review draft. The authors themselves were involved in this process and know that the very last thing this is is their personal opinions! Please change. [Peter Thorne, Norway]	The process to assess confidence is indeed highly regimented and is done extremely carefully after a great deal of care, and very careful consideration of the relevant literature. The fact remains, however, that such asessments rest on the expert consensus opinion of the authors. This is all moot in any case: This issue is relevant to the entire report not just Topic 2. Hence we have replaced this text with: "The degree of confidence in the projections outlined below varies from case to case. Confidence varies because the quality, amount and degree of agreement among different sources of evidence for particular projections and impacts vary." We then refer the reader to the earlier part of the report where confidence assessment is first discussed.
Topic 2	53	17	53	18	The statement on "opinions of expert authors" should be improved and moved to a more general introduction to expert judgement in Box SPM.1 on P 29. What is meant by "informed by the best available information", perhaps it could be specified. Also the reference to the whole SPM of WGI could be more specific here. [Government of Germany]	Agreed. This issue is relevant to the entire report not just Topic 2. Hence we have replaced this text with: "The degree of confidence in the projections outlined below varies from case to case. Confidence varies because the quality, amount and degree of agreement among different sources of evidence for particular projections and impacts vary." We then refer the reader to the earlier part of the report where confidence assessment is first discussed.

Topic 2	53	22	53	23	We question the use of the word will. If it is to be used, as opposed to virtually certain, consider defining "will" in the uncertainty terminology defined by IPCC. [Government of United States of America]	Rejected. The headline is identical to an approved WG1 SPM headline
Topic 2	53	24	53	26	It should be stated that the air temperature change of 0.3°C-0.7°C for the period 2016-2035 is based on multiple lines of evidence [Government of Netherlands]	While it is true that multiple lines of evidence were examined in reaching this conclusion, and that this is important for specialists, introduction of this point will not be understood without additional explanation. This will only confuse policymakers. We therefore think, on balance, that the statement is best left as it is.
Topic 2	53	25	53	26	Comment: Temperature changes are given relative to 1986-2005, but an offset to convert to changes relative to 1851-1900 is given. [European Union]	Indeed, this is what we do, as in WG1 SPM
Topic 2	53	25	53	26	The use of different references (recent decades vs pre-industrial era) always creates confusion. Why is it not possible to always use the pre-industrial era as reference?? This does not make it impossible to add, if the context or the specific topic at a particular place requires, changes relative to the recent decades. This applies to many places of the document. [Government of Hungary]	Rejected. We need two baselines. The "present-day", defined as 1986-2005 when describing future changes relative to current climate, and the "pre-industrial" baseline, defined as 1851-1900, when describing overall changes. This latter is only used when presenting global warming relative to "pre-industrial", as for example, in the context UNFCCC and likelihood to exceed or remain below a given climate target.
Topic 2	53	25	53	26	It's good to give a 'conversion' increment here for 1850-1900, but what about for preindustrial (which IPCC defines are a period earlier than that?) [Government of United States of America]	This is approved text from WG1 SPM. Pre-industrial temperature is not defined in WG1, 1851-1900 is the closest period given the observational data.

Topic 2	53	27			A statement should be added saying something like "It is assumed that very large volcanic eruptions will not occur in this period". [Government of Norway]	Agreed. It now says: "Estimates of near-term future climate depend partly on the committed change caused by past forcing from GHG increases and other factors, the time evolution of future natural climate variability and future anthropogenic forcing. The global mean surface air temperature change for the period 2016-2035 relative to 1986-2005 will likely be in the range 0.3˚C-0.7˚C (medium confidence). This projection is valid for the four RCP scenarios and assumes there will be no major volcanic eruptions or secular changes in total solar irradiance before 2035. "
Topic 2	53	28	55	16	Information on what is different and is not different between AR4 and AR5 is important and thus should be included in footnote. For example, state that "there appears to be no fundamental difference between the behavior of the CMIP5 ensemble in comparison with CMIP3" (page 1100 in WGI 12.4.9), and differences come from scenarios (SRES vs RCP), carbon cycle feedback (yes in CMIP3 and no in CMIP5), and base period difference (0.11℃ in 6 years). Otherwise, it would be confusing for those who are familiar with AR4 and try to compare it with AR5: the high end of projection of air temperature increase at the end of the 21st century in AR4 is 4.8 C whereas the value in AR5 is 6.4, which may mislead a reader to think the risk has reduced. [Government of Japan]	Considered, Space is a strong limitation in the SYR. We now have a section in topic 2 that describe models improvements and also scenarios differences
Topic 2	53	31	53	32	The second sentence in the shaded box could be clearer. Suggest simplifying to make the point that warming will not be uniform in space or time. Text could be added to the supporting paragraphs to explain how natural variability can influence short-term changes in global temperature, as there is nothing that speaks to that at present, but there is a short sentence about spatial variability in warming. [Government of Canada]	Accepted, second sentence has been removed, only keeping the first sentence as bold statement
Topic 2	53	34	53	39	Temperature changes given are relative to 1986-2005, but next paragraph (lines 41-44) expresses changes relative to 1850-1900. All these changes and those shown in Figure 2.2 should be expressed relative to 1850-1900. [European Union]	Reference period have been clarified.

Topic 2	53	34		39	Can these numbers be given relative to an 1850-1900 base period? [Government of Canada]	The vast majority of the projected changes provided are given relative to 1986-2005, including this one. This reference period was chosen, in part, as projected changes could be calculated fo a wider range of variables including sea-level and ocean pH. Furthermore this period was used in the evaluation chapter. So changing the reference period creates many additional problems. This is also the default period used in the WGI report. An exception is made on page 53 lines 41-44 for global average surface air temperature because this particular variable is commonly used by policymakers and change relevant to this earlier period is more relevant for this particular use.
Topic 2	53	34			It is unclear whether the reference baseline for temperature changes for the period 2016-2035 is 1986-2005, as stated for the period 2081-2100. [Government of United Kingdom of Great Britain & Northern Ireland]	As explained near the beginning of Section 2.2, projected changes are relative to 1986-2005 unless otherwise stated.
Topic 2	53	36	53	36	Wrong reference. WGI 11.3 seems to be 11.3.6.3 and 12.3 has to be 12.4. [Government of Netherlands]	We now cite: {WGI SPM, WGI 11.3, 12.4}.
Topic 2	53	38	53	39	This part should describe the information of RCP4.5 and RCP6.0, not limiting only RCP2.6 and RCP8.5. [Hirofumi Kazuno, Japan]	Due to space limitations and to keep the text simple we concluded that it would be best to restrict discussion here to RCP2.6 and RCP8.5 only.
Topic 2	53	39	53	39	Wrong reference. WGI 12.3 has to be 12.4 [Government of Netherlands]	Accepted. Changed accordingly
Topic 2	53	41	53	41	Does "end of the 21st century" mean 2081-2100 in this context, or 2100? [European Union]	Clarified, it means 2081-2100.

Topic 2	53	41	53	44	Confidence is given only at the end of the paragraph suggesting that all statements in the paragraph have the same confidence, which is not the case. Should read: Global surface air temperature change for the end of the 21st century is likely to exceed 1.5°C relative to 41 1850-1900 for all RCP scenarios except RCP2.6 (high confidence). It is likely to exceed 2°C for RCP6.0 and RCP8.5 (high confidence), more 42 likely than not to exceed 2°C for RCP4.5 (medium confidence), but unlikely to exceed 2°C for RCP2.6 (medium confidence). [Government of Netherlands]	Accepted. Changed accordingly
Topic 2	53	42	53	42	Missing confidence values. '(high confidene)' behind '....except RCP2.6.'; '(high confidence)' behind '...for RCP6.0 and RCP8.5, '; and '(medium confidence)' behind '...for RCP4.5'. [Government of Netherlands]	Accepted. Changed accordingly
Topic 2	53	44	53	44	Wrong reference. WGI 12.3 has to be 12.4. Optionally add: WGI Table 12.3 [Government of Netherlands]	Accepted. Changed accordingly
Topic 2	54	0	54	0	graph c: add a legend for the line types (dotted and continuous) [Government of Netherlands]	Revised figure changed, no more dotted lines.
Topic 2	54	0	54	0	graph c: put the small numbers (3 and 5) before the brackets and the large numbers (29, 37) inside the brackets, because the 3 and 5 are most important and correspond to the continuous line (not the dotted line). [Government of Netherlands]	Revised figure changed, no more dotted lines.
Topic 2	54	1	54	14	Figure 2.2: No comment in caption or text on the small step in temperature projections shown in panel (a) owing to the change in number of models. Temperature changes should be expressed relative to 1850-2100 (see comment no.46). [European Union]	Comment added with respect to he discontinuity in 2100 for global temperature. All quantities are relative to 1986-2005 on this figure.
Topic 2	54	1	54	14	The explanations of Figure 2.2 are relevant [JACQUES ANDRE NDIONE, SENEGAL]	Thank you
Topic 2	54	1			Figure 2.2: Please add ranges in panel (a) as in all other panels. [Government of Germany]	Rejected, WG1 did not provided assessed likely range for 2300. Too few were models available to assess a likely range
Topic 2	54	2	54	2	(a) should be added, at the beginning of the line. It should be specified in the caption that grey in (a) are historical simulations and NOT observations. [Thomas Stocker/ WGI TSU, Switzerland]	Accepted. Changed accordingly
Topic 2	54	2	54	2	Figure 2.2: The caption text attributed to panel 'a' is not specified. Following Figure 2.2 it should say "(a)". [Government of Canada]	Accepted. Changed accordingly
Topic 2	54	2			Insert (a) before CMIP5 [Government of New Zealand]	Accepted. Changed accordingly

Topic 2	54	3	54	3	It is good to explain the use of the uncertainty language, but the attempt here is not very well developed. This only cites a few uses, not how the statements should be understood/interpreted. Some other formulation should be considered here. [Government of Sweden]	This is really page 53. Agree that info on interpretation of confidence statements is needed, but this is a broader topic and is addressed earlier in report. We merely say in Topic 2 that "The degree of confidence in the projections outlined below varies from case to case. Confidence varies because the quality, amount and degree of agreement among different sources of evidence for particular projections and impacts vary." We then refer the reader to the earlier part of the report where confidence assessment is first discussed.
Topic 2	54	3	54	4	The Figure caption c) seems to be incomplete. [Government of Germany]	Caption has been revised
Topic 2	54	4	54	4	The reference period on the NH sea ice extent change is not stated. If it is 1986-2005, then consider deleting the phrase "relative to" before the bracket [Government of Kenya]	Caption has been revised
Topic 2	54	4			Delete the brackets around "5 year running mean" [Government of New Zealand]	Rejected
Topic 2	54	8	54	11	For panel (c) there no description of what the black dashed line represents. [Government of New Zealand]	Caption has been revised
Topic 2	54	11	54	11	Missing references for the sea level change: WGI 13.5.1 [Government of Netherlands]	Accepted. Changed accordingly
Topic 2	54	11	54	11	{WGI Figure SPM 7} should be moved at the end of the caption. WGI figure SPM 9 should be added (panel d) and WGI Figure 12.5 (panel a) [Thomas Stocker/ WGI TSU, Switzerland]	Accepted. Changed accordingly
Topic 2	54	11	54	14	Repetition. These sentences ('For sea level (d), based on.....during the 21th century.') are mentioned 3 times, namely also on page 55, line 5-8 and page 57, line 36-40. I would suggest to mention it just once, eg in the main text. [Government of Netherlands]	This statement is kept for table 2.1 and figure 2.2 but removed from the main text
Topic 2	54	11	54	14	The statement about collapse and additional contribution (last two sentences of the caption) should be a accompanied by a line of cite giving the source [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
Topic 2	54		54		In a graph (a) missing numbers of models for a period 2200-2300. [Government of Netherlands]	Accepted, revised figure makes clearer that numbers are for 2100-2300, not just for 2100-2200

Topic 2	54		54		SYR-54, Figure 2.2 and SYR-71 Figure 2.9: If the figures of the corresponding emissions are available, it is better to put those figures together. [Mikiko Kainuma, Japan]	Rejected, emissions have been shown already on Figure 2.1
Topic 2	54				figure 2.2. (a): It is strongly suggested to include also in figure (a) also the other RCPs, as in (b), including the vertical bars at the right of the panel. Furthermore explanation should be provided on the significant increase in uncertainty over time for RCP8.5 only whereas uncertainty for RCP2.6 does not change over time. [Government of Austria]	Rejected, the vertical bars represent the assessed (likely) uncertainty as presented in Table 2.1. This information is not available for 2300 as too few models performed these extensions beyond 2100. The uncertainty generally increases with the forcing(due to uncertainty on physical feedbacks).
Topic 2	54				Figre 2.2: delete legend for each chart (these include references to the various RCPs), but add a general coloured legend only showing the two RCPs shown on the graphs. [Government of Hungary]	Rejected. The side bars are not legend, these are mean and uncertainty for the 2081-2100 period.
Topic 2	54				Figure 2.2 Lables very small and faint particularly the colour keys on the right of each diagram. Consider increasing the font size slightly [Government of Kenya]	Accepted, figure improved
Topic 2	55	1	55	3	Table 2.1. only draws on WG1. Information from WG3 must be added, and consistency with the statements in the text must be established throughout the text, differences should be carefully explained. Most readers do not care about the IPCC-WGs, they need consistent and clear information. [Government of Germany]	Rejected, global surface temperature projections and sea-level rise for the RCPs are given by the comprehensive climate and Earth System models assessed in WG1. WG3 estimates are only indicative as based on one simple climate model tuned on the long term global mean temperature response of AR4 climate models.
Topic 2	55	1	55	4	Table 2.1. Many parts of the report discuss limiting global warming to 2 C or less under RCP2.6, but this table quotes a temperature rise of only 1 C owing to the baseline used. If temperature changes were expressed relative to 1850-1900, the temperature changes in the table would match those in the discussions. [European Union]	Rejected, the table shows the mid-century and late century warming and sea-level rise relative to present-day. Consistently to figure 2.2 and to the main text. This is identical to what was done in WG1 SPM. Table notes gives the observed warming to date.

Topic 2	55	1	55	4	Please consider including footnote c) and d) from WGI Technical Summary Table TS.1 page 90. [Government of Norway]	Accepted, we now use footnotes (a) to (d) as in WG1 SPM and TS.
Topic 2	55	1	55	8	In Table 2.1, the upper limit of global delta-T for RCP8.5, 2081-2100 is listed as 4.8 degrees. WG3 shows values as high as 7.8 degrees. Several factors contribute to this apparent difference, and they should be listed here. [Government of United States of America]	Rejected, WG3 Table SPM1 does not present the warming for RCP8.5, it presents a warming range for a category (>1000ppm) that does include RCP8.5. Also WG3 uses a different baseline (1850-1900)
Topic 2	55	1	55	16	Since reference point of preindustrial is used by wgiii we need also the other table relative to preindustrial not 1990 [Rachel Warren, United Kingdom]	Rejected, a table presenting the WG3 scenarios and warming relative to 1850-1900 is presented in section 3.
Topic 2	55	1			Table 2.1: Information needs to be added to this table to enable readers to understand these projections relative to "pre-industrial". [Government of Canada]	Accepted, we now use notes (a) to(d) as in WG1 SPM and TS. This mentions the historical warming.
Topic 2	55	2	55	2	Reference not specific enough. Change 'WGI SPM' to 'WGI SPM Table SPM.2' [Government of Netherlands]	Accepted. Changed accordingly
Topic 2	55	3	55	3	The broad ranges presented in this table seem inconsistent with the point results in the SPM. Suggest to maintain the integrity of the WG I results by presenting uncertainty information also in the SPM. It is the task of policy makers to make decisions under uncertainty and not the task of scientists to drop a proper treatment of uncertainty information in order to simplify the decision making process. [Jochen Harnisch, Germany]	Rejected, the numbers in the table (0.3 to 1.7 for RCP2.6, 2.6 to 4.8 for RCP8.5, and likewise for sea-level change) are identical to the numbers quoted in the SPM.
Topic 2	55	3	55	3	Table 2.1. On Table 2.1, replace "2045-2065" by "2046-2065" to be consistent with sited tables in WGI. [Government of Japan]	Accepted. Changed accordingly
Topic 2	55	3	55	4	In the headline of the table the period 2045-2065 is indicated. The SPM, WG1 refers to 2046-2065 in the same table. [Government of Germany]	Accepted. Changed to 2046-2065
Topic 2	55	4	55	8	redundant information, as it is also placed in the main text of the chapter, consider leaving it out or shortening, e.g.:"ignoring possible collapse of marine-based sectors of the Antarctic ice sheet" [Government of Netherlands]	This statement is kept for table 2.1 and figure 2.2 but removed from the main text
Topic 2	55	5	55	7	The statement is unclear: substantial rise or not exceed a meter? [Government of Germany]	Thsi statement is verbatim from WG1 SPM
Topic 2	55	5	55	8	Repetition. These sentences ('Based on the current understanding.....during the 21th century.') are mentioned 3 times, namely also on page 54, line 11-14 and page 57, line 36-40. I would suggest to mention it just once, eg in the main text. [Government of Netherlands]	This statement is kept for table 2.1 and figure 2.2 but removed from the main text

Topic 2	55	10	55	10	Rephrase beginning of sentence to "The Arctic region has and will continue to warm more rapidly than..." [European Union]	Accepted, rephrased as "will continue to warm…"
Topic 2	55	10	55	11	it is unclear whether the statement about land versus ocean applies to the arctic region or to all land and ocean worldwide. [Government of Netherlands]	Accepted, sentence rephrased.
Topic 2	55	10	55	11	'The Arctic region will warm more rapidly than the global mean…'. Some possible reasons should be given here. [Government of Switzerland]	Rejected, reasons are local amplification (eg. Snow feedbacks). Cannot be explained given the word limit.
Topic 2	55	10	55	11	The authors should separate the the two thoughts in this one sentence, else readers will think that they are referring only to the limited amount of land around the Arctic Ocean, when clearly the Figure 2.3 is about land globally. The suggestion is to replace the text with two sentences. "The Arctic region will warm more rapidly than the global mean. Warming globally will be larger over the land than over the ocean (very high confidence) (Figure 2.3). {WGI SPM, 11.3, 12.3, 12.4, 14.8}" [Government of United States of America]	Accepted. Changed accordingly
Topic 2	55	10	55	16	These sections are quite "isolated" ones from the text as only one region is mentioned. Suggest a more general discussion on regional changes vs. global means. [Government of Sweden]	Rejected, polar amplification is the only regional detail given in the WG1 SPM. Word limit is a hard constraint.
Topic 2	55	13	55	16	This section on temperature extremes could be clarified with quantitative statements on the potential magnitude of projected changes. [European Union]	Rejected, this statement is verbatim from WG1 SPM.
Topic 2	55	13	55	16	The statement here should be supported by estimated changes in frequency. [Government of Switzerland]	Rejected, this statement is verbatim from WG1 SPM.
Topic 2	55	14	55	14	Increase not increases [Peter Thorne, Norway]	Text changed to "as global mean temperature increases"
Topic 2	55	14	55	14	Change 'temperatures' to 'temperature' [Government of Switzerland]	Accepted. Changed accordingly
Topic 2	55				Table 2.1: panels (a) and (b) show global averages while the rest show global mean. Table 2,1 on page 55 shows global mean. Are panels (a) and (b) NOT the mean? This should be made more clear. [Government of Netherlands]	Table 2.1 shows global means
Topic 2	55				Table 2.1. Please add a footnote consistent with WGI SPM:" The observed warming to the reference period 1986−2005 is 0.61 [0.55 to 0.67] °C from 1850−1900, and 0.11 [0.09 to 0.13] °C from 1980−1999, the reference period for projections used in AR4." [Government of Norway]	Accepted, notes from WG1 SPM table SPM2 added.
Topic 2	56	1	56	1	The sea level panels should have hatching for consistency within this figure. [Peter Thorne, Norway]	Rejected. Hatching on sea level map cannot be done, lacking assesment of natural variability in WG1 material

Topic 2	56	1			Figure 2.3: Recommend simplifying the description of what the hatching and stippling mean. What is important for readers to know here? Are stippled or hatched areas (or both) "good" or "bad" in terms of having confidence in the projected change? What does the absence of either stippling or hatching mean in panel c? [Government of Canada]	Hatching and stippling are defined as in WG1 SPM Figure SPM8.
Topic 2	56	4			Insert "change in" before "average sea level" so that the figure caption is consistent with the figure: Panel (c) is Change in average sea level. [Government of New Zealand]	Accepted, added "change" next to average sea level.
Topic 2	56	11	57	9	A comment on projected drought changes would be beneficial in this section. [European Union]	Accepted, statement on droughts added
Topic 2	56	13	56	17	This section does not discuss the projected precipitation changes under RCP2.6, which are important from a policy perspective. [European Union]	Changes in precipitation have not been assessed for RCP2.6 in WG1 SPM or underlying chapters
Topic 2	56	13	56	17	The explanations of this first paragraph are relevant [JACQUES ANDRE NDIONE, SENEGAL]	Accepted, thank you
Topic 2	56	15	56	17	Since these statements are conditional on future emissions following the RCP 8.5 scenario, should 'will' be replaced with 'would'? [Government of Canada]	Rejected, this statement is verbatim from WG1 SPM.
Topic 2	56	19	56	20	It would be useful for the reader if the term "Extreme precipitation events" was defined. The term is subjective as are any conclusions formed using such term. [Government of United States of America]	Extremes are defined in WG1 Box 2.4, there are multiple definitions, such as 5-day max precipitation, daily precipitation, 20-year return value. The statement applies to all.
Topic 2	56	19	56	21	It is strongly suggested to include also information on the RCP for which this assessment on extreme precipitation events is valid. [Government of Austria]	The assesemnt is done across scenarios. It is estimated from the return period of 1986–2005 20-year return values of annual maximum daily precipitation corresponding to 1°C of local warming,
Topic 2	57	0	57	0	footnote 12: is it "sea ice extent" or "sea ice extent in September" ? [Government of Netherlands]	It is sea ice extend in september as said in the main text
Topic 2	57	1	57	4	It is strongly suggested to include also information on the RCP for which this assessment on the area encompassed by monsoon systems is valid. [Government of Austria]	Accepted, text now refers to all RCPs

Topic 2	57	1	57	4	It would be good to provide a global average change in precipitation. [Government of Switzerland]	Rejected. Projected precipitation changes are spatially very heterogeneous, with many areas seeing increases and others seeing decreases in precipitation under all RCP scenarios. This can well be seen from looking at the projections maps of precipitation given in Figure SYR FOD 2.xx. The value added by providing information on globally averaged precipitation changes is thus very limited and the relevance for local/regional policymakers is unclear.
Topic 2	57	6	57	9	It is important to reconcile the conclusions highlighted in this paragraph on tropical cyclones with those summarized in WGI Table SPM.1 which lists low confidence through mid-century and a likelihood only for RCP 8.5 near the end of the century. Otherwise the conclusions in this paragraph seem to contradict those of the WGI SPM. This would entail synthesizing conclusions between WGI chapters 11 and 14. [Haroon Kheshgi, United States of America]	Rejected, the text here is verbatim from WG1 Chapter 14 ES.
Topic 2	57	11	57	29	Section 2.4.3 (& SPM-section2): The climate changes on the Polar Regions are not efficiently informed, thus it will be better to enhance this section considering main findings and key features from such as 'WGI TS5.5.5 Projected Long-Term Changes in the Cryosphere and TS 5.7 Long-Term Projections of Sea Level Change', Chapter 28 of WGII AR5 report and etc. [Government of Republic of Korea]	No change. The key messages are already included in the spave available.

Topic 2	57	11	57	44	Since this is a SYNTHESIS report, it is important to be comprehensive and consistent among observation, prediction and impact assessment in terms of ocean's oxygen minimum zones (OMZs). Currently, observation points out that oxygen concentrations have decreased (1.2.2) and the expansion of OMZs will further constrain fish habitat (2.5.1); therefore, it is appropriate to also include description here about model projection of OMZs, which is crucial in assessing the future change of risks, For your information, relevant description in WGI is the following: 【WGI ch.3, p. 645】Given limitations of global ocean models in simulating today's O2 distribution (Cocco et al., 2013), as well as reproducing the measured changes in O2 concentrations over the past 50 years (see Chapter 3, and Stramma et al., 2012), the model projections are uncertain, especially concerning the evolution of O2 in and around oxygen minimum zones. [Government of Japan]	Information on projections included as requested.
Topic 2	57	14	57	15	It is important to mention here that "it is very likely that the Atlantic Meridional Overturning Circulation (AMOC) will weaken over the 21st century" (p.70 - line 16) to be consistent with the session 1.2.2 Observed changes in the climate system: Ocean Changes (p.32-33). [Government of Brazil]	Material moved from 2.6
Topic 2	57	17	57	17	The period referred in this paragraph should be clearly shown. According to the SPM of WG1 report, year-round reductions in Arctic sea ice extent are projected by the end of the 21st century. [Government of Japan]	The period is now quantified in the footnote.
Topic 2	57	17	57	20	Here, it would be useful to also have a result following RCP2.6, if possible, to characterise the range of possible outcomes, under different scenarios. [Government of Sweden]	Material added
Topic 2	57	21	57	21	add the spread in percentages: 7% ± 4% for RCP2.6 and by 25% ± 8% [Government of Netherlands]	Uncertainties added - should these be likely range
Topic 2	57	21	57	22	Need to specify by what date these decreases are expected. [Government of United States of America]	The period is now quantified in the footnote.
Topic 2	57	21	57	29	Please add the time ranges to which these statements apply. [Government of Germany]	The period is now quantified in the footnote.
Topic 2	57	21	58	2	This part should describe the information of RCP4.5 and RCP6.0, not limiting only RCP2.6 and RCP8.5. [Hirofumi Kazuno, Japan]	Because of space consideration only the full range is given
Topic 2	57	22	57	22	"RCP8." should be "RCP8.5". [Government of Japan]	Corrected - Thank you
Topic 2	57	22	57	22	8.5! [Peter Thorne, Norway]	Corrected - thank you
Topic 2	57	22	57	22	Add reference WGI 12.6.2 [Government of Netherlands]	The correct section is 12.4.6.2, but line of sight to subsection only is given
Topic 2	57	22			"(medium confidence)" should be part of the previous statement (not a sentence of its own) [Government of Netherlands]	Corrected - thank you

Topic 2	57	24	57	26	There is no mention of possible large release of methane following thawing of permafrost. Such a release could increase the rate of global warming. [European Union]	Now addressed in 2.4
Topic 2	57	24	57	26	Imprecise wording that may imply that permafrost extent is reduced by this amount. It would be more correct to say that permafrost will thaw to depths exceeding 3.5 m over 37-81% of the permafrost zone (models are really projecting a change in thaw depth) [Government of Canada]	reworded
Topic 2	57	25	57	26	To clarify the projected period, add 'by the end of 21st century' [Government of Japan]	clarification added as a footnote
Topic 2	57	26	57	26	add the spread in percentages: 'between 37% ± 11% (RCP2.6) to 81% ± 12% [Government of Netherlands]	Clarification added
Topic 2	57	26			Either delete "by" or delete "between" - you don't need both words. If "between" is retained, then also need to change "to" to "and" [Government of New Zealand]	Corrected - thank you
Topic 2	57	28	57	29	To clarify the projected period, add 'by the end of 21st century' [Government of Japan]	Clarification added as a footnote
Topic 2	57	28	57	29	Regarding the sentence "The global glacier volume, excluding glaciers on the periphery of Antarctica, is projected to decrease by 15 to 55% for RCP2.6, and by 35 to 85% for RCP8.5", what exactly is the periphery of Antartica? This needs to be clearer, for comparison. [Government of Brazil]	Text simplified to "in Antarctica"
Topic 2	57	28	57	29	The term "on the periphery of Antarctica" is vague. If this can be described more precisely, that would be helpful. [Government of United States of America]	Text simplified to "in Antarctica"
Topic 2	57	31	57	32	"that observed during 1971-2010:" specify what that observed rate is. [Government of United States of America]	Observed rate added.
Topic 2	57	31	57	32	Should not this statement be associated with a date, or date range? [Government of United States of America]	Clarification added as a footnote
Topic 2	57	31	57	40	Should be mentioned here that sea-level rise could be much higher too: Many semi-empirical model projections of global mean sea level rise are higher than process-based model projections (up to about twice as large), but there is no consensus in the scientific community about their reliability and there is thus low confidence in their projections. (WG1, SPM, page 26). [Kaisa Kosonen, Finland]	We present the projections that we have medium confidence in rather than low confidence projections.
Topic 2	57	34	57	36	There is a need to add time periods and reference periods for the projected changes in global SLR here. [Government of Canada]	These have been added as a footnote

Topic 2	57	34	57	40	some mention of the following uncertainties is warranted...end of century sea level projections from models probably provide underestimates because the models do not include a variety of positive feedbacks, including: a.) deeply incised fjords that maintain marine instability for decades if not centuries longer than what models project; b.) global climate models do not include increasing wildfire and the soot impacts on amplifying melt increases; c.) global climate models do not simulate persistent atmospheric circulaiton anomalies that have in reality allowed Greenland melting to increase faster than forecast; d.) perched impermeable ice layers forming after extreme melt years produce faster sea level response from the Greenland ice sheet than is projected by model scenarios. [Government of Denmark]	This suggestion would not be consistent with the underlying report. The most importand uncertainty relates to Antarctica and this is covered in the text.
Topic 2	57	34	57	40	The first lines duplicate Table 2.1, the second part on Antarctica repeats the footnote of this Table. Please straighten text. [Government of Germany]	Material deleted
Topic 2	57	34		40	Global mean sea level rise will likely be in the ranges of 0.26 to 0.55 m for RCP2.6 to 0.45 to 0.82 m for RCP8.5. For RCP8.5, the rise by the year 2100 is 0.52 to 0.98 m, with a rate during 2081–2100 of 8 to16 mm yr1 (medium confidence). (Figure 2.2, Table 2.1). {WGI 13.5} Based on current understanding, only the collapse of marine-based sectors of the Antarctic ice sheet, if initiated, could cause global mean sea level to rise substantially above the likely range during the 21st century. However, there is medium confidence that this additional contribution would not exceed several tenths of a meter of sea level rise during the 21st century. {WGI, 13.4,13.5} It is highly questionable that discharges from Greenland, and the deteriorating state of the Greenland ice sheet, are not mentioned along with the above. [Harold David Tattershall, United States of America]	material deleted
Topic 2	57	34			Timeframe for this projection? 2081-2100 relative to 1986-2005 [Government of Netherlands]	Material deleted
Topic 2	57	36	57	40	"only the collapse of marine-based sectors of the Antarctic ice sheet"… is there a more understandble way to say this? [Government of United States of America]	Material deleted
Topic 2	57	42	57	42	"very likely" should be written in italic [Thomas Stocker/ WGI TSU, Switzerland]	Corrected - thank you
Topic 2	57	43	57	44	According to Chapter 13 of the IPCC WG1 AR5, about 68% and 72% of the coastlines will experience a relative sea level change within +/- 20% of the GMSL change for RCP4.5 and RCP8.5. Since RCP2.6 is not used, it would be more accurate if scenarios are specified. In addition, it is preferred to say “±20%” rather than “20%” as in WGI 13.6.5. [Government of Japan]	Scenarios now specified and “±20%” now used.

Topic 2	57	48	57	48	The term positive feedback should be explained in other words, e.g. in the glossary. [Government of Finland]	Accepted, text on feedback has been revised. The second part of the sentence precisely explains that climate change will reduce carbon sinks. Information on carbon sources from permafrosts added. Ocean acidification now as a separate paragraph.
Topic 2	57	48	57	51	The flow of ideas is a little awkward here. A positive feedback amplifies an initial response to a climate driver. Sentence 2 could be structured to speak to this, explaining that positive feedbacks include both reductions in uptake of CO2 by sinks on land and in the ocean or increases in carbon sources on land and in the ocean, both of which would result in higher atmospheric CO2 levels. Experiments with current ESMs show that climate change will weaken sinks, meaning that more emitted CO2 will stay in the atmosphere. What can we say at this stage about the effect of climate change on carbon sources (e.g., emissions of carbon due to permafrost thaw)? Suggest including such information in here. The information on ocean acidification is not linked to the bolded text. Suggest being clear whether ocean acidification is a factor in weakening ocean carbon sinks. [Government of Canada]	Accepted, text on feedback has been revised
Topic 2	57	48	57	51	These sentences will remain mysterious to lay persons. Please improve using clearer language. [Government of Germany]	Accepted, text on feedback has been revised
Topic 2	57	48	57	51	I do not think that the statement "There is high confidence that the feedback between climate and the carbon cycle is positive in the 21st century." correctly represents the finding in WGI 6.4 which the text refers to. I understand that the statements in WGI 6.4.2.1 can be paraphrased as "The direct feedback between CO2 concentration and biospheric activity (in both land and ocean) is negative with high confidence, and the feedback of the loop consisting of CO2 concentration, climate, and biospheric activity is positive with medium confidence." My reading may be wrong. I think that the editor of SYR should contact the CLA of WGI Chapter 6 for fact checking. Also (assuming that my reading of the WGI report is correct) I feel that SYR should mention the first feedback as well if it mentions the second one, otherwise it sounds out of balance. [Kooiti Masuda, Japan]	Accepted, we added WG1 SPM statements on ocean sinks, land sinks and on carbon release from permafrosts
Topic 2	57	48	58	2	Section 2.4.4: Quantity or length of a section won't be a problem if contents are strong enough to exist as an independent section. However, this section is definitely required to enhance contents. Please revise the section with more supportive information. [Government of Republic of Korea]	Accepted, text on feedback has been revised

Topic 2	57	49	57	49	Suggest revision. 'climate change will partially offset…' is a vague statement. Suggest rewording along the lines of 'declining solubility of CO2 in the oceans with increasing temperatures and reduced soil and vegetation uptake will ...' [Government of Australia]	Accepted, text on feedback has been revised. However, there is not room here to explain the many processes at play. Reference to WG1 chapter 6.4 is given
Topic 2	57	51	58	2	explain what ocean acidification has to do with the carbon cycle, e.g. "Direct CO2 uptake by the ocean increases its acidity. Earth System Models project …" [Government of Netherlands]	The statement on ocean acidification is now separate from the previous paragraph to avoid confusion
Topic 2	57	51	58	2	MUST GO IN SPM: “Earth System Models project a global increase in ocean acidification for all RCP scenarios, with a decrease in surface ocean pH below present-day values in the range of 0.06 to 0.07 for RCP2.6, to 0.30 to 0.32 for RCP8.5.” ADD: Emergency. [Peter Carter, Canada]	Accepted. Ocean acidification statement now in the SPM.
Topic 2	58	1	58	1	Fig 2.4 again uses GtC, should be converted to CO2eq in my view [Helmut Haberl, Austria]	We have included GtC for traceability to WGI
Topic 2	58	1	58	2	Please add information on the H+ concentration as done in the observation section on P 32. [Government of Germany]	Future changes in H+ concentration are not estimated in the WGs reports
Topic 2	58	3	58	3	These two lines are very jargony. And "positive" could be interpreted to mean "good." Say something more straightforward, like "The feedback.. will act to increase warming." [Government of United States of America]	Accepted, text on feedback has been revised
Topic 2	58	4	59	32	At the UNFCCC SB40 conference in June 2014 in Bonn, at the 3rd meeting of the Structured Expert Dialogue (which is part of the 2013-2015 Review), an adapted version of Figure 1.7. of the SRREN showing CO2 released to the atmosphere and stocks of recoverable carbon from fossil fuels in the ground was presented. We suggest to include this very useful information in the Synthesis report (Section 2 of the SPM and/or at least Section 2.4.5 of the underlying Synthesis report) and to add the information from WG1 on the cumulative carbon budget that would allow global average temperature to remain below 2°C, e.g. by drawing a horizontal line at 2909 GtCO2. [Government of Germany]	Stocks added to budget table.
Topic 2	58	4			Section 2.4.5: it is suggested that future moisture levels are reported and how they might affect climate change. [Government of Hungary]	Humidity is best treated as part of the climate response, detailed in WG1 report
Topic 2	58	7	58	9	This could be a place to include a bullet about the susceptibility of boreal and permafrost soil carbon to warming. Such a bullet does exist on Page72 lines 8 to 12. We wonder if it might occur here instead. [Government of United States of America]	Focus here is on large scale temperature response for clarity

Topic 2	58	17	58	19	In the text CO2 emissions are mentioned in GtC (not in GtCO2). Gt CO2 (also indicated at the top of Figure 2.4) would be easier to compare with other parts of the SYR. [Government of France]	Text revised as suggested.
Topic 2	58	17		17	Since TCRE will be unfamiliar to most readers, suggest defining it in the text rather than in a footnote. [Government of Canada]	GtC used to provide traceability to IPCC WGI.
Topic 2	58	20	58	20	Figure 2.4: increase color contrast, as orange and rose are not easily to distinguish. Increase line width for triangles for better visibility. In the upper right corner, there is a sharp break of the colored plume, probably not intended. [Lena Menzel, Germany]	Stars will be removed
Topic 2	58	20	59	4	Figure 2.4: Temperature changes should be shown relative to 1850-1900, as has been used previously in this report. [European Union]	Figure has been clarified to avoid symbols
Topic 2	58	20	59	4	<Figure 2.4> The four large star symbols should be deleted because these are not described in the page 28 of the approved WG1 SPM and these may create confusion for readers. [Hirofumi Kazuno, Japan]	Figure modified and clarified.
Topic 2	58	20			Figure 2.4: Suggest to add to the X axis title "Historical and projected…". Also, suggest to explain why it is necessary to apply two types/groups of scenarios (RCPs and "WGIII" scenarios), and what the differences are [Government of Hungary]	A separate axis showing projected emissions from 2011 added to the corresponding version of this figure in topic 3. Not shown here for traceability to IPCC WGI SPM.10.
Topic 2	58	20			This is a interesting and important figure. Most of the scenarios from WGIII lie a bit below the RCPs. This makes sense, as WG1 indicated that some of the climate models have climate sensitivity in the higher end of the range. [Government of Norway]	An additional datapoint corresponding to the 2000s has been added. Reasons for discrepancy are given in the footnotes of the table.
Topic 2	58	21	58	21	Suggest clarify Fig 2.4 whether non-CO2 GHG's are included, and if not what significance that has on the interpretation of total CO2 emissions. [Government of Australia]	Temperature includes impact of non-CO2, axis is cumulative CO2, as stated.
Topic 2	58	21			I suggest some additions to the text in the caption reading " Global mean surface temperature increase" to specify the timing that is being referred to. This would clarify whether the figure is displaying the global mean temperature increase at the time the indicated cumulative emission level is reached, or the eventual equilibrium temperature increase resulting from the indicated cumulative emission, or .... [David Wratt, New Zealand]	The point is that this is approximately the peak temperature reached with that level of cumulative emission. Will clarify.
Topic 2	58	22	58	23	Please clarify what the blue, orange and red lines actually represent in the figure. The red area is the range from multiple GCM models, that is clear. The caption states that the coloured lines are from a "hierarchy of climate-carbon cycle models", which is vague and unclear. [Tommi Ekholm, Finland]	Caption will be clarified with reference to figure SPM10 WG1

Topic 2	58		58		In graph legend: 'MAGICC'to 'MAGGIC6'? [Government of Netherlands]	Version of MAGICC mentioned in table footnotes. We do not think further elaboration is appropriate here.
Topic 2	58		58		Please describe why the differences between WG1 and WG3 results for RCPs in Figure SPM.5(B). In addition, are the star marks for 2100? If yes, please describe it. [Keigo Akimoto, Japan]	Observed 2000s symbol to be added to fig. Note on reasons for discrepancy in table footnotes.
Topic 2	58		59		Figure 2.4 in the caption is stated that the star symbols are estimeted by the MAGICC6, which is never explained in the text, I think one line of explaination would make the caption more clear [Government of Netherlands]	Explanation and model reference provided in WG3 report
Topic 2	58				Figure 2.4. Request the clarification of the roles of stars in Figure 2.4. Are they representing the values of 4 RCPs in 2100? Also request the clarification as to the coherency between WG1 and WG3, the difference of the cumulative total global CO2 emissions from the corresponding result of WG1. Otherwise, suggest to replace the figure with WG1 SPM figure.SPM.10 [Government of Japan]	Stars are to be removed. Revised figure will be closer to SPM10.
Topic 2	58				Figure 2.4. In Figure 2.4, the MAGICC6 estimates (star symbols) are located below the multi-model results (colored lines). Some explanation is required for this difference as well as consistency between WGI and WGIII methods. [Government of Japan]	Stars will be removed, but the origin of the discrepancy will be clarified.
Topic 2	59	1	59	2	Section 2.4.5: The baseline scenarios used for the future projections are related to the section 3.2 and Figure 3.1 as the Figure 2.4 and related sentences (line 11 - 15 in page 58) are driven from the section 3.2. Therefore it is better to put an indication of section 3.2 and Figure 3.1 at the end of the sentence. [Government of Republic of Korea]	Forward reference to 3.2 in figure legend
Topic 2	59	3	59	3	Reference not specific enough. Change 'WGI SPM' to 'WGI Figure SPM.10' [Government of Netherlands]	Good suggestion.
Topic 2	59	6	59	9	The text refers to warming relative to 1861-1880. Whether the reader can take this as a proxy for pre-industrial is not clear. Some consistency on this matter throughout the report is necessary. [European Union]	A note will be added that this is essentially the same as pre-industrial.
Topic 2	59	6	59	9	Table 2.2 includes the 'trillionth ton' (1000 GtC) figure, but it is only referred to in text as 3665 GtCO2. Given the policy relevance of this statement it would be useful to see this referred to in the text, and a clearer statement of what percentage of this target has already been emitted. [European Union]	Significance of CO2-only budget now explained in text.
Topic 2	59	6	59	14	Table 2.2. For consistency with WGI SPM (p.27), 3665 GtCO2 and 2895 GtCO2 are to be replaced with 3670 GtCO2 and 2900 GtCO2. Also, 3665 GtCO2 and 4435 GtCO2 in Table 2.2 are to be replaced with 3670 GtCO2 and 4440 GtCO2. [Government of Japan]	Internal consistency of this report (with respect to rounding etc) takes priority

Topic 2	59	6	59	32	This carbon budget section should be made more comprehensible for policymakers. [Kaisa Kosonen, Finland]	We are revising.
Topic 2	59	6	59	32	The text and the table provide very important budget information on "total anthropogenic CO2 emissions", and the information of WG1 and WG3 information is very useful. We suggest the following improvements: - add information on the remaining budget from WG1 in the last line. - improve the headings of the lines (2nd block: "Cumulative emissions between 1879 and 2011", 3rd block: "Cumulative emissions between 2011 and 2100"). - Check consistencies with the information in the WG reports (e.g. current numbers are inconsistent with WG3 Table SPM.1). [Government of Germany]	Suggestions 1 and 3 accepted, Suggestion 2 is unclear, but we are moving to two blocks (from 1879 and from 2011) which should help.
Topic 2	59	8	59	8	The "when accounting for non-CO2 forcings as in RCP2.6" is not very feasible to understand here. How large are these non-CO2 forcings, how much have already occurred and how much is there fore the future viz. 2oC? [Government of Sweden]	Text will be clarified
Topic 2	59	9	59	9	It is strongly suggested to include another sentence informing by when this budget will have been consumed under the assumption that the global GHG emissions are stabilized at current rate, noting that this assumption implies a global emission reduction rate of about 2% per year compensating for the current increase in global emissions. [Government of Austria]	Sentence added
Topic 2	59	11	59	12	Heading table 2.2: It is clear from the context provided in the text that this is by 2100. However, a timeframe in the table heading would be helpful. [Lena Menzel, Germany]	Table text clarified
Topic 2	59	11	59	13	Table 2.2., It should be made more clear how the different elements relate to CO2 with assumptions on non-CO2 gases, CO2 without such assumptions and CO2eq as a whole. The numbers now seem to have different contexts are thus difficult to reconciliate. [Government of Sweden]	We will clarify, although we believe the intent is clear.
Topic 2	59	11	59	14	Should there not be one single number reported for the simple models, given that the temperature targets are reported in probability? [European Union]	No, because ranges account for scenario dependence.
Topic 2	59	11	59	14	A synthesis needs to be done for the cumulative emissions. This table also could include the observed emissions to 2011 and the observed temperature change to push the synthesis even further. [European Union]	This information is in the text and figures. It would further complicated the table.
Topic 2	59	11	59	32	Table 2.2 is very difficult to read. Maybe change the rownames a little bit: add 'since 1870'or 'since 2011' and ('GtCO2' in the rownames. Remove the header 'Cumulative CO2 emissions from 2011 in GtCO2'. Draw a fat line below the threshold degrees of warming, or color part pf the cells. Add the amounts of GtC for consistancy and completeness. [Government of Netherlands]	Table now refers only to GtCO2. GtC budget in text

Topic 2	59	11	59	32	As a supplement to the information given in Table 2.2 we believe that an updated version of Figure 1.7 from the Special Report on Renewable Energy Sources and Climate Change Mitigation will give policy relevant information. With an updated version we mean that the numbers should be updated with numbers from the WGIII assessment report. You should also consider to include information in the figure with respect to the amount of remaining emissions to achieve the 2 degree goal (1000 Gt CO2 when accounting for non-CO2 forcings) [Government of Norway]	Good suggestion: resources and reserves estimates will be added from table 7.1 of AR5-WG3
Topic 2	59	11	59	32	Table 2.2: It is very important to explain the cumulative CO2 emission budgets, but it is difficult to understand the Table 2.2. Please modify the table so that readers can easily understand what is written. - Please divide the table "Cumulative CO2 emissions from 1870 in GtCO2 from the table of "Cumulative carbon budget consistent with temperature goal", as the columns of the upper table and the lower table do not match. - Please explain the difference of the numbers in the upper table ("Cumulative carbon budgets...") and the lower table ("Cumulative CO2 emissions from 1870 in GtCO2"), e.g., 3665GtCO2 (emissions "likely" less than 2degree C) and 2900-3600 GtCO2 (66%). - "An amount of 1890 GtCO2 (1630-2150) was emitted by 2011 (SYR-11, Line 22-23). It is assumed that 1850 GtCO2 for anthropogenic CO2 emissions over the 1870-2010 period. In the text in page SYR-11, the cumulative CO2 emissions is written and in the footnote in page SYR-59, the cumulative CO2 emissions over the 1870-2010 is written. It is better to use the number in the same period to avoid confusion. [Mikiko Kainuma, Japan]	Good suggestions: (1) will revise title, (2) CO2-only section to be removed, (3) numbers will be reconciled but with consistent rounding
Topic 2	59	11			Table 2.2: Information about cumulative emissions and temperature targets is important information from the AR5. This table, however, is very difficult to understand. We have several suggestions for improving this table (see additional detailed comments below). Our main comment is to request an explanation for the difference in the estimated cumulative emissions from the RCP scenarios and the WGIII scenarios. The models considered in WGIII consistently predict less warming or equivalently higher emissions for a given level of warming than the CMIP5 models. Please explain. In many cases the ranges given for the WGIII models do not even overlap with the CMIP5 results for cumulative emissions. Also, please explain why a range of values for cumulative CO2 emissions for the WGIII scenarios is given whereas only a single number is given for the RCPs. [Government of Canada]	Ranges for WG3 values are scenario uncertainty only, and scenarios may not include RCPs. Offset is mostly due to WG3 models being fitted to observations and biased low relative to GCMs.

Topic 2	59	11			Table 2.2. Detailed comments and suggestions: i) Some numbers in the table are different to those given in SPM of WGI. In particular the figures of 3665, 4435 and 3000 GtCO2 reported in the table are 3670, 4440. and 3010 GtCO2 in the WGI SPM. This is presumably due to a different rounding convention, but it would be better to be consistent. ii) Suggest using the same titles for the upper and lower parts of the table if possible (i.e. are cumulative carbon budgets and cumulative CO2 emissions synonymous or not?), iii) To make it clearer that the first row is based on CO2 only scenarios whereas the other rows incorporate non-CO2 forcings, we recommend this info be added to the "title rows" for the upper and lower parts of the table, iv) What does 'multiple parameters' refer to in rows 5 and 6? Please explain. [Government of Canada]	i) Rounding consistent within SyR (ii) top panel to be moved to text (iii) ditto (iv) we will explain further
Topic 2	59	11			Table 2.2: Suggest labeling row 4 as "Complex models, RCP scenarios including non-CO2 emissions." [Government of Canada]	Table now refers only to multi-gas scenarios
Topic 2	59	12			Please add a section number to the reference to WGIII, to specify what part of WGIII is being referred to. [David Wratt, New Zealand]	References given in Topic 3
Topic 2	59	13	59	13	Table 2.2: It seems strange that from WG I only single values are presented rather than ranges in the row "Complex models, RCP scenarios only". I suggest to not make a somewhat arbitrary selections from the range of available and credible model results. Please add a column showing the full range of uncertainties derived by WGI. The table should be re-made showing the full range of results from WG I and WG III. [Jochen Harnisch, Germany]	Table has been clarified, but this would make the table unreadable and enormous. The aim is to synthesise, not reproduce all WG1 and WG3 results.
Topic 2	59	17	59	18	Table 2.2. If any cut-off values are used for the Gaussian distribution (excluding negative values, for example), that should be mentioned explicitly. [Government of Japan]	We will check if this makes any difference to the numbers reported. If not, this seems unnecessary complexity.
Topic 2	59	17	59	18	TCRE should be explained in more detail. [Government of Germany]	It willl be defined in the text
Topic 2	59	20	59	20	The "assuming non-CO2 forcing follows the RCP8.5" is not very feasible to understand here. How large are these non-CO2 forcings, how much have already occurred and how much is there fore the future viz. 2oC? [Government of Sweden]	We agree this needs clarifying.
Topic 2	59	27	59	27	Please specify "simple carbon cycle / climate model MAGICC" as it is more informative than"simple model". Cf, for example, footnotes to Table SPM.1 in WGIII SPM. "Simple" is in relation to more complex models, not necessarily "simple" in an absolute sense. [Government of Sweden]	References to MAGICC will be replaced by "Simple model" throughout, since similar results would be obtained with any similar equation-set.
Topic 2	59	28		29	If the ensemble really samples over climate system and carbon cycle uncertainties then why is the spread in the MAGICC simulations in Figure 2.4 much narrower than the spread in CMIP5 models? If these were fully sampled over in a way consistent with the CMIP5 spread then the range should be at least as wide as that of the CMIP5 models. Suggest reviewing. [Government of Canada]	This spread shows scenario uncertainty due to non-CO2 forcings, not response uncertainty.

Topic 2	59	31	59	31	Suggest clarify the meaing of 'uncertainty in model structure'. [Government of Australia]	We think this is adequately discussed in the underlying reports.
Topic 2	59	32			Table 2.2. p59 line 8 1890GtCO2 is referred to as cumulative emissions by 2011. Multiple figures on cumulative emissions may lead to confusion among readers. [Government of Japan]	We are endeavouring to reduce the numbers of numbers provided.
Topic 2	59		59		It is not easy to understand Table 2.2. Please separate this table to a)（Cumulative carbon budgets consistent with temperature goals）, b)（below Cumulative CO2 emissions from 1870 in GtCO2）. Then, in the b) table, 1) net anthropogenic warming、and then 2) Fraction of simulation should be described (The order should be changed). [Keigo Akimoto, Japan]	CO2-only budgets to be removed.
Topic 2	59		59		According to the Table 6.3 of WG3, the cumulative emission between 2011 and 2100 is 630-1180 GtCO2 for 430-480 ppm CO2eq. On the other hand, Table 2.2 of this report describes the 1050-1750 GtCO2 for 66% probability achieving 2 degrees C. Please explain the differences between WG3 and Synthesis Reports. [Keigo Akimoto, Japan]	This arises from the WG3 focus on single scenario families, and combining resuts across families as here. Result have been harmonised.
Topic 2	59				Table 2.2. As temperature values are given relative to the 1861-1880 base period (note a.), request explanation on difference with 1850-1900 average and with 1986-2005 average to enable comparison with figures provided in other parts of the report. [Government of Japan]	Reference periods will be clarified.
Topic 2	59				Table 2.2. Please write down the cumulative CO2 budget of the table.2.2 as 0 - 1570 GtC (5760 GtCO2), 0-1210 GtC (4440 GtCO2), and 0 -1000 GtC (3670 GtCO2)" as in WG1 SPM p.27. (WG1 SPM p.27) Limiting the warming caused by anthropogenic CO2 emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880, will require cumulative CO2 emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO2), 0 and about 1210 GtC (4440 GtCO2), and 0 and about 1000 GtC (3670 GtCO2) .. when accounting for non-CO2 forcings as in RCP2.6. An amount of 515 [445 to 585] GtC (1890 [1630 to 2150] GtCO2), was already emitted by 2011." [Government of Japan]	We hope to improve the clarity of the text of WG1 SPM, but the meaning to be conveyed is the same.
Topic 2	59				Table 2.2. The correspondence among table 2.2, WG3 Table SPM.1 and Table 6.3 is not clear from the note of table 2.2. Appreciate if further explanation is given. [Government of Japan]	Further explanation will be provided

Topic 2	59				Table 2.2. As CO2 emissions provided under “Cumulative carbon budgets consistent with temperature goals” do not account for non-CO2 emissions, request addition of another row with CO2 budget figures accounting for non-CO2 emissions from AR5 WGI SPM, for better comparison with “Cumulative CO2 emissions from 1870 in GtCO2” and “Cumulative CO2 emissions from 2011 in GtCO2” [Government of Japan]	Table has been clarified
Topic 2	59				Table 2.2. Request that reference year for the temperature in “Cumulative CO2 emissions from 1870 in GtCO2” be made explicit. [Government of Japan]	This will be done.
Topic 2	59				Table 2.2. If rows “Fraction of simulations” and “Net anthropogenic warming” set conditions for both “Cumulative CO2 emissions from 1870” and “Cumulative CO2 emissions from 2011,” suggest table be reorganized to avoid confusion. [Government of Japan]	Table is being redrafted.
Topic 2	59				Table 2.2. Request figures for complex models be provided for cumulative CO2 emissions from 2011 in GtCO2 as well. [Government of Japan]	Will be done.
Topic 2	59				Table 2.2. As shown in Table 2.2, cumulative CO2 emissions consistent with temperature goals are different between “complex models, RCP scenarios only” and “simple model, multiple parameters & WGIII scenarios”. We would appreciate a clarification on the reasons why the differences occur. As the numbers on this table reflect approved contents of WGI SPM, we expect authors to add the supplemental info to a place where they find appropriate. [Government of Japan]	This will be addressed in the revised table.
Topic 2	59				Table 2.2. Please consider to include an additional row in this table showing how much of the cummulative carbon budget that is left to emit if we are to achieve the 2 degree target under different probabilities. We believe that this is very policy relevant. [Government of Norway]	This information is already contained in the table, but will be drawn out.
Topic 2	60	1	60	32	The analysis is very robust [JACQUES ANDRE NDIONE, SENEGAL]	We have included GtC for traceability to WGI
Topic 2	60	1	60	32	Suggestion: add to this section the enumeration of key risks (p. 12 SPM WGII) [Government of Netherlands]	Stocks added to budget table.
Topic 2	60	3	60	3	It is suggested to insert "Future" at the beginning of the sentence. [Government of Austria]	Humidity is best treated as part of the climate response, detailed in WG1 report
Topic 2	60	3	60	8	Suggest deletion Section is inconsistent with WGII SPM and does not provide clear guidance. Suggest removing last sentence to align with text of WGII SPM. [Government of Australia]	Focus here is on large scale temperature response for clarity
Topic 2	60	3	60	19	We support the inclusion of these two paragraphs, which are very clearly written and present exactly the information that the reader is looking for in a synthesis report. [Government of New Zealand]	GtC used to provide traceability to IPCC WGI.

Topic 2	60	5	60	6	I don't think we should mention potential benefits in the same breath as large magnitudes of climate change, separate these concepts [Rachel Warren, United Kingdom]	Text revised as suggested.
Topic 2	60	10	60	11	please provide confidence statement for this statement [Government of Netherlands]	Figure has been clarified to avoid symbols
Topic 2	60	11	60	11	The formulation is not very successful here, as it suggests that what is mentioned of risks beyond 4oC occur only after passing that threshold. What applies in between 1-2 and 4? [Government of Sweden]	Figure modified and clarified.
Topic 2	60	11	60	12	The claim here that "Global climate change risks are high to very high with global mean temperature increase of 4°C or more above preindustrial levels in all reasons for concern..." is misleading and not representative of the Reasons for Concern findings. As the graph (Figure SPM.9 in this draft) illustrates, risks turn high for five indicators well before 4 degrees - in fact in about 2.5 degrees. This sentence must be changed to avoid creating a perception that it's 4 degrees that would be a problem, when the graph clearly illustrates that 2 degrees already comes with high or very high risks for three out of five indicators. [Kaisa Kosonen, Finland]	Selection of base period agreed in WG1
Topic 2	60	11	60	19	"are the dominant factor" should be "are expected to be the dominant factor" [Government of United States of America]	The figure has been revised and the stars have been removed
Topic 2	60	13	60	13	As in the SPM it is entirely unclear to me what is meant by 'all reasons for concern'. For some reason I have the Monty Python sketch about the baggage retrieval system at heathrow running through my head here. :-) [Note you do not need to respond to this part of this comment - I just wanted to share!]. What reasons for concern are only becomes truly clear in later text, and crystal clear in the Box Art. 2. Efforts to better link / highlight / justify the use of the reasons for concern paradigm would help. Because if a reader is, like me, reading this coming in 'cold' to this concept then currently it is very opaque what these are and what their justification is. They may even justify a box in their own right that really makes the point what these are. [Peter Thorne, Norway]	A separate axis showing projected emissions from 2011 added to the corresponding version of this figure in topic 3. Not shown here for traceability to IPCC WGI SPM.10.
Topic 2	60	13	60	13	This is the first mention of reasons for concern in the SYR. This will not have any meaning for readers. If the RfC are to be featured in the SYR, then the five categories will need to be described. [Government of Canada]	An additional datapoint corresponding to the 2000s has been added. Reasons for discrepancy are given in the footnotes of the table.

Topic 2	60	16	60	16	(high confidence) should be written in italic [Thomas Stocker/ WGI TSU, Switzerland]	Accepted. Text, Figure and Table (incl. captions) have been revised to provide a clearer presentation. The point is that this is approximately the peak temperature reached with that level of cumulative emission.
Topic 2	60	17	60	17	The "reasons for concern" have not been introduced yet; mentioning them here might be confusing. [Government of United States of America]	Caption will be clarified with reference to figure SPM10 WG1
Topic 2	60	17	60	17	It's not correct that the concept of tipping point has an associated notion of "irreversibility". Indeed, tipping points can be crossed from different directions (in a given phase space) for non-linear systems. Some definitions and explanations on this are given by Lenton, Duarte, Wassman and others in 2012 (AMBIO). Other papers by these and other authors also align these definitions in one direction, i.e., tipping points can be reversible (although not every tipping point is). E.g., see landmark paper by Lenton et al (2008) in the PNAS : http://www.pnas.org/content/105/6/1786.abstract (pdf freely available at that link). [Government of United States of America]	Version of MAGICC mentioned in table footnotes. We do not think further elaboration is appropriate here.
Topic 2	60	18	61	24	"Tipping point" is a key word that needs to be specifically defined here and elsewhere in the SYR. [Government of United States of America]	Observed 2000s symbol to be added to fig. Note on reasons for discrepancy in table footnotes.
Topic 2	60	21	60	22	Change suggested: "Risks caused by a changing climate depend on the magnitude and rate of climate change, but also on the exposure, vulnerability, social organization, degree of development, poverty and income levels, and ability of affected systems to adapt." [Pedro Alfredo Borges Landáez, Venezuela]	Explanation and model reference provided in WG3 report
Topic 2	60	21	60	22	we would suggest to mention mitigation, as this can prevent climate change damage from occuring. Though, in the short term it may be more limited. [Government of Netherlands]	Stars are to be removed. Revised figure will be closer to SPM10.
Topic 2	60	24	61	8	As adaptation is not covered in this topic, we suggest to eleborate on the synthesis of risk and adaptation only after adaptatoin has been discussed in topic 3. for figure 2.5, please show only the risks without adaptation, and later show the figure including the reduced risks in topic 3, after adaptation has been discussed. [Government of Netherlands]	Figure has been revised and the RCP stars have been removed.
Topic 2	60	25	60	27	In section 4.3 it is clear that besides constraints and limits to adaptation there are also tradeoffs. Consider revising sentence "…and there are constraints, limits and tradeoffs to adaptation" [Government of Netherlands]	Forward reference to 3.2 in figure legend

Topic 2	60	25	60	32	Suggest reframing content. Section is inconsistent with WGII SPM. Reframe text in lines 25-32 to align with corresponding content in WGII SPM. [Government of Australia]	Good suggestion.
Topic 2	60	26			We would remove a word "significantly" , as significant is used for statistical results. And on line 27 as well. [Government of Netherlands]	Pre-industrial is consistently defined and used throughout the SYR. The SYR Glossary defines pre-industrial as 1750 or before.
Topic 2	60	27	60	27	Please change "limits to adaptation" to "limits of adaptation actions". [Government of Germany]	Significance of CO2-only budget now explained in text.
Topic 2	60	32			why cite TS instead of SPM? The same table appears in both (see WGII Box SPM.2 Table 1). [Stewart Cohen, Canada]	Internal consistency of this report (with respect to rounding etc) takes priority
Topic 2	60				This page repeats material from previous section, and is a bit repetitive in itself: please restructure and straighten text. It would be very useful to provide the list of key risks and RfC of WG2 SPM P 12 - 13. [Government of Germany]	The text has been revised to clarify the concept of carbon budgets and the related key assessment findings
Topic 2	61	0	61	0	title: place it at the top of the graph and add "Current and" before "future key risks" [Government of Netherlands]	Suggestions 1 and 3 accepted, Suggestion 2 is unclear, but we are moving to two blocks (from 1879 and from 2011) which should help.
Topic 2	61	0	61	8	Figure 2.5: the snowflake for glaciers, snow, ice, parmafrost is only depicted in "Central and South America". There are some more regions where melting ice/snow poses human and natural systems at risk, either through e.g. sea level rise, flooding or habitat loss, especially in polar areas the symbol should be added.. [Lena Menzel, Germany]	Accepted. Text, figure, table and captions have been clarified.
Topic 2	61	0	61	8	Figure 2.5: Polar regions: this category is located in the north of the global map, and this visual information may lead the reader to the conclusion that only northern polar regions are at risk. The author team may wish to add information, that both artic and antarctic regions are addressed. [Lena Menzel, Germany]	Sentence added
Topic 2	61	1	61	1	text in figure 2.5 is difficult to read, this also applies to the very small symbols used in the figure. The blue color is a challenge. [Government of Denmark]	No, because ranges account for scenario dependence.

Topic 2	61	1	61	1	Comment for Figure SPM.7 also apply to Figure 2.5; it is too small to be easily read and understood. We also noted that the legend on the Small Islands inset on Figure SPM.7 with the hashed section of the bars as "potential for adaptation to reduce risk" is different than the legend for the similar image (Table 29-4) within Chapter 29 which indicates that hashed portion of the bars depicting "Risk Level with current adpataton." Authors/editors should ensure that the imagery and legends in Figure SPM.7 are consistent with the language and imagery used in the chapters which provide the source for the findings in the Synthesis Report [Government of United States of America]	This information is in the text and figures. It would further complicated the table.
Topic 2	61	1	61	1	Fig. 2.5: Is "increased flood damage to infrastructure and settlements" a good example to have for Australasia? Sea level rise inundation/flooding seems to be covered by the other graphic. We would think drought might be a more appropriate phenomenon to highlight (or heat stress). See for example the precipitation projections in Fig. 2.3. [Government of United States of America]	Table text clarified
Topic 2	61	1	61	1	In translating Assessment Box SPM.2 Table 1 from the WG2 SPM, the authors removed what we view to be the most valuable information - which is the text that describes the potential for adaptation. The authors should consider including pieces of this, congizant of space constraints. [Government of United States of America]	We will clarify, although we believe the intent is clear.
Topic 2	61	1	61	8	Figure 2.5 (WG2 TS) has no effects on food production for even 4degC warming in Europe and North America. This is in complete contradiction to the evidence in WG2 chapter 7. Such warming will have profound effects on food production in both these regions. [John R Porter, Denmark]	Table now refers only to GtCO2. GtC budget in text
Topic 2	61	1	61	8	Figure 2.5: It is a good visualisation of a complicated and long table, WGII Table TS.4. [Government of Republic of Korea]	Good suggestion: resources and reserves estimates will be added from table 7.1 of AR5-WG3
Topic 2	61	1	61	8	Suggest revision. Figure 2.5 For the Australasian region, risks associated with montane and terrestial species (from WGII TS Table 4) is missing from Figure 2.5. [Government of Australia]	Ranges for WG3 values are scenario uncertainty only, and scenarios may not include RCPs. Offset is mostly due to WG3 models being fitted to observations and biased low relative to GCMs.
Topic 2	61	1	61	8	Suggest clarify Figure 2.5. Is the risk assumed equal for differing systems? Also for Small Islands first of risk figures "ecosystem services, and ecomonic stability" is not in WGII TS Table 4 - the source of information for the figure. For the Austalasian region risks associated with montane and terrestial species (from WGII TS Table 4) is missing from Figure 2.5. [Government of Australia]	i) Rounding consistent within SyR (ii) top panel to be moved to text (iii) ditto (iv) we will explain further

Topic 2	61	2			Figure 2.5: this figure should be printed in "Landscape" mode so that it can be read in a meaningful way. [Government of Hungary]	Table now refers only to multi-gas scenarios
Topic 2	61	8			why cite TS instead of SPM? The same table appears in both (see WGII Box SPM.2 Table 1). [Stewart Cohen, Canada]	Reference on page 61, line 8 is to WGII Technical Summary, comment not clear.
Topic 2	61	10	61	10	2.5.1 Ecosystems and their services in the oceans, at coasts, in freshwater and on land: in this section, sea ice could be included as a habitat that will get lost particularly in the Arctic [Lena Menzel, Germany]	Table has been clarified, but this would make the table unreadable and enormous. The aim is to synthesise, not reproduce all WG1 and WG3 results.
Topic 2	61	10	61	16	We support the inclusion of the statement regarding risk of substantive impacts on ecosystems as a result of climate change and the consequences for biodiversity. [Government of New Zealand]	We will check if this makes any difference to the numbers reported. If not, this seems unnecessary complexity.
Topic 2	61	10			It is not clear why terrestrial ecosystems ("on land") are ranked last? [Government of Hungary]	Done, explained in the text
Topic 2	61	12	61	16	Please highlight the important link between ecosystem services, livelihoods and economic development. Without this, some people may disregard these important impacts. [Government of United Kingdom of Great Britain & Northern Ireland]	We agree this needs clarifying.
Topic 2	61	13	61	13	to include before ecosystem services the wording of environmental functions and ... [Government of Bolivia]	Done in Topic 2
Topic 2	61	18	61	24	We support the inclusion of this statement about climate change induced risk to species and ecosystems, noting that many species will be unable to adapt locally or move fast enough. [Government of New Zealand]	This spread shows scenario uncertainty due to non-CO2 forcings, not response uncertainty.
Topic 2	61	18	61	24	Figure 2.5 has a lot of information in a little space - recommend expanding. [Government of United States of America]	We think this is adequately discussed in the underlying reports.
Topic 2	61	19	61	19	We would replace a word "significant" with "large", as significant is used for statistical results. [Government of Netherlands]	We are endeavouring to reduce the numbers of numbers provided.
Topic 2	61	19	61	19	The authors should consider adding WGII 5.4 as supporting chapter reference. [Government of United States of America]	CO2-only budgets to be removed.
Topic 2	61	21	61	22	Species to adapt to climate change process is more complex, considering the microorganisms, invertebrates, lower plants, such huge number of species on the planet, and the evolution of species adaptation process is very complex, there is a large uncertainty if the species could become extinct by the current method of analyzing. We can not say “many“under current study and understanding. Suggested "Many species will be unable to adapt locally", was revised to "Some species will be unable to adapt locally". [Jianguo Wu, China]	This arises from the WG3 focus on single scenario families, and combining resuts across families as here. Result have been harmonised.

Topic 2	61	24	61	24	The authors should consider adding 29.3 as another supporting Chapter reference. [Government of United States of America]	Reference periods will be clarified.
Topic 2	61		61		Figure 2.5 has horizontal bars showing risk levels ranging from "very low" to "very high". Definition of these risk levels is unclear and seems inconsistent with those in Box Introduction 1 on page 30. [Government of Netherlands]	We hope to improve the clarity of the text of WG1 SPM, but the meaning to be conveyed is the same.
Topic 2	61				Figure 2.5: Caption should read: Examples of ... [Government of Austria]	This will be done.
Topic 2	61				Figure 2.5. Delete the figure. This figure is subjective as it is based on expert judgement. As such, it is not falsifiable and we can not regard it as a scientific finding. Should you keep it despite this comment,, make it very clear that "This figure is subjective as it is based on expert judgement". [Taishi SUGIYAMA, Japan]	Accepted. Further explanation is now provided in a number of table notes.
Topic 2	61				Figure 2.5 Labels and symbols extremely small and faint. Consider increasing the sizes slighly [Government of Kenya]	Table has been clarified
Topic 2	61				Figure 2.5: Figure caption should mention that these are few selected examples and also the selection criteria. [Lena Menzel, Germany]	Table is being redrafted.
Topic 2	62	0	62	0	Figure title (A) "keep up with climate change" is unclear. What is meant, local adaptation as well as tracking climate change by migration of individuals and/or range shifts? Or is this integration only based on rate of migration? Please find a more accurate formulation. [Andreas Fischlin, Switzerland]	Done. Table now reports cumulative CO2 emissions in GtCO2.
Topic 2	62	0	62	35	Figure 2.6: it would be desirable if all 3 barcharts had a comparable y axis, so that one can compare the levels of risk between the different categories. Is it possible to connect CO2 level, temperature, and change of the respective category, so that the reader can compare the different color shades and have a visual idea on how severe the impacts are in the categories? [Lena Menzel, Germany]	Accepted. Further explanations are given in a number of table notes
Topic 2	62	0	62	35	Figure 2.6: figure layout and readability would improve, if the text in the barcharts would be replaced by symbols. Panel B and C could use the WGII symbols, panel A would need new symbols. [Lena Menzel, Germany]	This information is already contained in the table, but will be drawn out.

Topic 2	62	0	63	10	It becomes not clear that migration rates and/or rates of range shifts (not necessarily the same) form only one element of adaptation by species to climate change and if rates contrast too much that this may lead to extinction risks. Extinction also depends on other issues such as changing realized niches due to a specific climate change in specific gegraphical conditions or changes in the fundamental niche of a species due to microevolutionary processes such as selection, gene flow, gene drift etc. as triggered by climate change in its "adaptive" history, e.g. while tracking a fast rate of climate change. While some of these considerations may be not of general interest, I consider it preferable if authors would allude to the first point somewhere, by stating that migration/range shifts are only one critical element from the entire spectrum of effects that may create extinction risks for species.The relevance of non-climate change drivers is well expressed on page 62, lines 37-43, but the complexity of climate change effects alone on species is not equally well expressed. The resulting uncertainties are considerable and are likely to be highly policy relevant. [Andreas Fischlin, Switzerland]	The necessity to be extremely brief in a SPM prevents us from unpacking in detail all the factors which could influence a species ability to adapt to changing climate.
Topic 2	62	1	62	34	We support the inclusion of Fig 2.6 and the coverage of: (A) risk that terrestrial species are unable to keep up with climate change, (B) risk to marine organisms under ocean acidification and when combined with warming, (C) and risk that sea level rise exceeds adaptation capacity of human and natural systems. [Government of New Zealand]	Thank you
Topic 2	62	1	62	35	Fantastic piece of work. I haven't checked the numbers, but it looks great. However needs to have some kind of intro saying that the concept is the same as the RFC burning embers figure, but that that diagram looks at risks from the magnitude of cc, and here we are examining the risks from the rate of cc, and hence only those sectors which we (a) know are dependent on the rate of change and (b) where we know something about the rate of change that the system is sensitive to i.e. we can judge what the colours should be, are included. That similar diagrams might be constructed for all sectors but we aren't able to do that as we don't know eg how fast adaptation in agriculture could proceed. [Rachel Warren, United Kingdom]	Thank you. The caption is now modified to be clearer about the intent
Topic 2	62	1			Figure 2.6: This figure is very useful, but temperature achsis should be added in order to allow comparison to the reasons for concern figure SPM.9. [Government of Germany]	The axes have been revised since this draft.
Topic 2	62	2	62	35	Caption: lines 10-34 can be omitted. [Government of Netherlands]	Caption has been revised
Topic 2	62	2	62	35	Figure 2.6: As the authors say the caption of this figure should be shorten and simplified! [Government of Republic of Korea]	Caption has been revised

Topic 2	62	8	62	17	The figure (A) gives the impression as if there would be no risk for species in mountaineous areas. This is misleading, since despite being perhaps able to track within 100 m altitude easily a climate change of an entire century (e.g. 20th) climate change is (i) projected to accelerate relative to those rates and tracking as observed in the past is more challenged in the future and considerable uncertainties arise where more sophisticated approaches such as at least species distribution modeling would be called for and (ii) the fact that mountains have limited altitude is competely omitted. The capability to keep up with rate of climate change is there of no help and should be reflected properly somewhere. Not to mention this risk anywhere is in this context inappropriate. Some mention should also be made that range shifts are not necessary the same as migration by individuals. Thus a highly vagile migratory bird species, may despite its high mobility have limits in shifting its range if strong depdencies on other sessile species, e.g. plants, is present. It is not clear inasmuch as authors have paid proper attention to this difference when making their assessment. [Andreas Fischlin, Switzerland]	The caption is fairly explicit about what is meant by the figure, and read in that context, it would be unreasonable to assume that mountains are not at risk from other aspects of climate change, other than rate of change.
Topic 2	62	12	62	12	This formulation is awkward, given the fact that trees move very, very slowly in space. Notably when compared to the relatively high speeds by which highly mobile species, such as migratory birds or insects, can migrate. [Andreas Fischlin, Switzerland]	The caption has been extensively changed since the FOD
Topic 2	62	17	62	27	Temperature rise decreases solubility of CaCO3. OA combined with warming does not directly lead to a shift in sensitivity threshholds to lower CO2 concentrations. [Akihiko Murata, Japan]	OA effects are not just related to solubility of CaCO3. This simplistic view should be abandoned. There is rising evidence that elevated CO2 raises sensitivity to thermal stress and vice versa.

Topic 2	62	18	62	19	The conclusion for moderate effects of OA and attribution of effects on peteropods should be reconciled with WGII Chapter 18's conclusion (Table 18-1) that effects are minor and attribution has very low confidence. If these are conclusions found in lab experiments rather than the environment, then that should be stated explicitly, and not written in a way to infer effects have been attributed with confidence. [Haroon Kheshgi, United States of America]	The executive summary of chapter 6 says: Shell thinning in planktonic foraminifera and in Southern Ocean pteropoda has been attributed fully or in part to acidification trends (medium to high confidence). These are field observations supporting the statement that with present acidification trends the risk of continued effects at ecosystem levels is moderate. As said in Table 18-1 laboratory findings inform the appropriate attribution and interpretation of field observations. So effects are small and still of minor importance at ecosystem level but on the verge of becoming more widespread and thus not to be ignored when assessing risk.
Topic 2	62	27	62	27	In Figure 2.6, leftmost panel, the way the information is presented is confusing. Specifically, showing results for different scenarios, with a different date range for each scenario, makes it impossible to directly compare scenarios to one another. The WG2 SPM has a figure that presents the same information much more clearly; suggested that that figure be used here. [Government of United States of America]	The layout and labelling has been changed
Topic 2	62	37	62	43	We support the inclusion of this statement with respect to the incresing risk for species that face extinction, to a large degree due to climate change. [Government of New Zealand]	Thank you for this supportive statment.
Topic 2	62	37	62	43	Suggest to add clarification: "(C) For sea level rise, it is likely that extreme sea levels have increased since 1970, largely as a result of the rise in mean sea level. The height of a 50-yr flood..." [Government of United States of America]	This caption has been extensively revised
Topic 2	62	37			Here, it is not enough to state in general that there will be extinctions. It should be added that a lot of species may extinct either globally and/or locally (this may be even more important!) that are either keystone species or key to directly required products and services. This would probably raise more justified concerns and justify action. [Government of Hungary]	This generalization is not possible without solid knowledge of the specific examples and lowering the confidence in the statement.

Topic 2	62	39	62	39	"A large fraction..." is quite vague, but sounds very ominous. Can the text be quantified a bit more on this? 10%, more than half, etc.? [Government of United States of America]	This statement can not be quantified as the degree of extinction depends on magnitude of change and has not been calibrated with espect to climate shift.
Topic 2	62	41	62	41	Please include 'variations in precipitation' - as many species will be threatened by increased exposure to drought or longer duration between heavy rainfall events. [Government of United States of America]	point well taken and added.
Topic 2	62	42	62	42	Owing to the high confidence that cc will increase extinction risk surely it is more than just 'likely' that cc will reduce biodiversity I would say it is 'very likely'. And unless we doubt that biodiversity supports ecosystem services then the rest follows [Rachel Warren, United Kingdom]	This formulation has been removed from the Topic 2 text.
Topic 2	62		62		figure 2.6A: the graph gives a wrong idea that mountains are safe, whereas in fact : "However, species that already occur near mountaintops (or other boundaries) are among the most threatened by climate change because they cannot move upwards (Ponniah and Hughes, 2004; Thuiller et al., 2005; Raxworthy et al., 2008; Engler et al., 2011; Sauer et al., 2011)." WGII 4.3.2.5. Also, the combination of different RCPs with different rates of climate change is not very easy to understand. Consider adding panel A of figure 4.5 from WGII or something else to make it more understandable. [Government of Netherlands]	The revised caption is fairly explicit about what is meant by the figure, and read in that context, it would be unreasonable to assume that mountains are not at risk from other aspects of climate change, other than rate of change.
Topic 2	62		62		figure 2.6B: it is not clear where the data to construct second bar (OA and warming) is taken from [Government of Netherlands]	The data ultimately come from the underlying WG2 chapter, whhich is referenced.
Topic 2	62				Figure 2.6 Labels are very faint. Consider enhancing them [Government of Kenya]	Figure has been redrafted
Topic 2	62				Figure 2.6: the figure caption notes the caption is to be shortened; this could be readily done by putting much of it in the main text for this sub-section. [Government of United Kingdom of Great Britain & Northern Ireland]	The captions has been completely redrafted
Topic 2	63	1	63	3	medium confidence is reported, whereas, based on sentences in WGII executive summary of chpt 6, page 5 and chpt 6.4.1.1 high confidence could be used. [Government of Netherlands]	"medium confidence" applies to low latitudes, with the present wording the confidence statement is correct.
Topic 2	63	1	63	10	We support the inclusion of the statement regarding global marine species redistribution and marine biodiversity reduction in sensitive regions under climate change. [Government of New Zealand]	Thanks for the supportive statement

Topic 2	63	1		19	Insert here the risk of ecological shifts (regime shifts), maybe in its own paragraph, together with impacts on ecosystem resilience. Only biogeographical shifts are mentioned in the first of these paragraphs. Phenological changes are also missing. [Alessandra Conversi, United Kingdom]	These aspects are implied in the respective statement and developed further in the underlying chapters.
Topic 2	63	3	63	4	Mostly a target of 2C warming is to a pre-industrial time. Why in this sentence as a reference point is used 2001-2010? Please make it consistent [Government of Netherlands]	Reference periods are either pre-industrial or recent, consistently throughout SYR.
Topic 2	63	3			Please give warming relative to pre-industrial level. [Government of Germany]	Reference periods are either pre-industrial or recent, consistently throughout SYR, consider adding preindustrial.
Topic 2	63	6	63	7	WGI 6.4.5 (p.534) writes "the model projections are uncertain, especially concerning the evolution of O2 in and around oxygen minimum zones", which seems to contradict with the statement; checking accuracy is appreciated. [Government of Japan]	The loss of oxygen from the oceans with further warming and stratification has high confidence. The precise numbers are uncertain.
Topic 2	63	12	63	19	We support the inclusion of the statement regarding marine ecosystems at risk form ocean acidification. [Government of New Zealand]	Thanks for the supportive statement
Topic 2	63	14	63	14	Should the text read "increase from RCP2.6 to 8.5" - as shown in Figure 2.6? [European Union]	This comment is well taken and correct. In line with SPM this paragraph refers to data presented in Figure 2.7B. This reference has been added at the right location.
Topic 2	63	19	63	19	"Extinction risk is increased" compared to what? [Government of United States of America]	refers to p. 62, l. 41?! Reference periods are both preindustrial and recent.
Topic 2	64	0	64	0	graph A: after "A1B" add "≈ RCP 6.0" [Government of Netherlands]	The explanation in the present caption includes the requested term (?).
Topic 2	64	0	64	0	graph B upper part: change "0.005 tonnes km^-2" into "5 kg per km^2" [Government of Netherlands]	This is the approved WGII SPM version. Catch is given in tonnes.
Topic 2	64	0	64	0	graph B lower part: after "µatm" add "≈ ppm" [Government of Netherlands]	uatm is the correct unit to use. It being equivalant (more or less) with ppm has been explained in the caption which seems most appropriate.
Topic 2	64	0	64	0	graph B lower part: with an arrow indicate that the numbers along the top of the bar charts indicate "number of species in study" [Government of Netherlands]	inserted (on top of bars) in the respective sentence in caption.

Topic 2	64	1	64	1	The authors should consider adding 29.3 as another supporting Chapter reference. [Government of United States of America]	likely refers to p. 63, l. 10: reference added.
Topic 2	64	1	64	9	We support the inclusion of Fig 2.7 [Government of New Zealand]	Thanks for the supportive statement
Topic 2	64	1	65	4	Figure 2.7: Why are results from the older SRESA1B scenario used? Would be better to use RCP8.5 for both parts of this figure. Use units of ppm in the lower row of the figure instead of microatmospheres. [European Union]	These are the projections available. Their comparability with RCP scenarios has been developed in the caption. uatm is the correct unit to use. It being equivalant (more or less) with ppm has been explained in the caption which seems most appropriate.
Topic 2	64	6	64	7	" … showing the distribution of ocean acidification in 2100 under RCP8.5". Please specify what depth in the ocean the pH information is for - I assume it is ocean surface pH ? [David Wratt, New Zealand]	inserted surface before ocean (to yield: surface ocean acidification)
Topic 2	64				Fig. 2.7: bar charts of panel (B) are very difficult to follow. What exactly is vertical axis? Are these measurments or projections? Consider replacing the horizontal axis with RCP labels rather than the pCO2 unit which is seen nowhere else in the report. [Government of Netherlands]	The way the data are depicted relates to how they are reported and used in the literature. Their comparability to RCP scenarios is developed in the figure caption. uatm is the correct unit to use. To enhance clarity, sentence was modified into: "The bottom panel compares the % fraction of species sensitive to ocean acidification."
Topic 2	64				Figure 2.7 (A) Delete the figure. Figure (A) is LOW CONFIDENCE in magnitude as clearly stated in WG2 report. It is quite misleading to put such a figure in SYR. [Taishi SUGIYAMA, Japan]	The phenomenon has high confidence. The absolute numbers have low confidence. This expresses uncertainty in the absolute estimate but does not change the validity of the findings.
Topic 2	64				Figure 2.7 (B) Delete the figure. The category 1371-2900 is not relevant with any scenarios by 2100 and so it should be dropped as it gives wrong impression that the impacts of acidification is near. If you omit the category, the conclusion that can be drawn from the figure would be that "impacts of acidification does not depend on emission scenarios". Perhaps it is not worth keeping any more as a message using a figure. Should you keep the figure the conclusion has to be redrawn accordingly. [Taishi SUGIYAMA, Japan]	This reviewer has likely misunderstoofd the figure, which expresses differences in sensitivity between animal phyla. Relations of the CO2 ranges to RCP scenarios are provided in the caption.

Topic 2	64				figure 2.7 Labels for the bar graphs at the bottom are faint. Consider enhancing them. [Government of Kenya]	Accepted.
Topic 2	65	3	65	4	"WGII figure SPM 6" should be added in the bracket along with the other citations. For the line of cite, the WG has to be specified [Thomas Stocker/ WGI TSU, Switzerland]	agreed and adopted.
Topic 2	65	6	65	10	Mention possible large emission of methane from thawing permafrost here, or section 2.4.4.. [European Union]	Accepted and done.
Topic 2	65	6	65	10	I added the words which marked with red:Carbon stored in the terrestrial biosphere is susceptible to loss to the atmosphere as a result of climate change, deforestation, and ecosystem degradation (high confidence). Increased tree mortality, deterioration of forest health (including loss of some tree spicies) and associated forest dieback will occur in many places in the next one to three decades (medium confidence), posing risks for carbon storage, biodiversity, wood production, water quality, amenity, and economic activity. [Government of Turkey]	The suggested text cannot be accepted for the following reasons: the notion of 'forest health' is undefined in the underlying texts; it is true that some species are likely to be lost at given locations, but equally true that others may be gained, so the impact of composition change per se on the carbon cycle, which is the subject of this paragraph, is not necessarily negative.
Topic 2	65	6	65	10	I added the words which marked with red:Carbon stored in the terrestrial biosphere is susceptible to loss to the atmosphere as a result of climate change, deforestation, and ecosystem degradation (high confidence). Increased tree mortality, deterioration of forest health (including loss of some tree spicies) and associated forest dieback will occur in many places in the next one to three decades (medium confidence), posing risks for carbon storage, biodiversity, wood production, water quality, amenity, and economic activity. [Eray Özdemir, Turkey]	The suggested text cannot be accepted for the following reasons: the notion of 'forest health' is undefined in the underlying texts; it is true that some species are likely to be lost at given locations, but equally true that others may be gained, so the impact of composition change per se on the carbon cycle, which is the subject of this paragraph, is not necessarily negative.
Topic 2	65	6	65	10	We support the inclusion of the statement regarding carbon stored in the terrestrial biosphere is susceptible to loss to the atmosphere as a result of climate change, deforestation and ecosystem degradation. [Government of New Zealand]	Noted with thanks

Topic 2	65	6	65	10	This paragraph is confusing because the first two lines refer climate change, deforestation and ecosystem degradation, but the description only applies to climate change or degradation effects from medium to high emissions scenarios. To round out these ideas, we suggest including text from WGII, Ch4 Executive Summary, Pg 5 Lines 6-7, "The direct effects of climate change on stored terrestrial carbon include high temperatures, drought and windstorms, indirect effects include increased risk of fires, pest and disease outbreaks. [Government of Canada]	Accepted and done.
Topic 2	65	6	65	10	Carbon stored in the terrestrial biosphere is susceptible to loss to the atmosphere: large amounts of carbon have accumulated in permafrost, and will be released to the atmosphere upon permafrost thawing. This is discussed more detailed in 2.6 "Long-term, irreversible and abrupt changes". However, as carbon storage by ecosystems is discussed in 2.5, permafrost could be addressed briefly here with a reference to 2.6 [Lena Menzel, Germany]	Accepted and done.
Topic 2	65	6		10	Carbon stored in the terrestrial biosphere is susceptible to loss to the atmosphere as a result of climate change, deforestation, and ecosystem degradation (high confidence). Increased tree mortality and associated forest dieback will occur in many places in the next one to three decades (medium confidence), posing risks for carbon storage, biodiversity, wood production, water quality, amenity, and economic activity.{WGII SPM, 4.2 3, 25.6, Figure 4-8, Boxes 4-2, 4-3, and 4-4} This reviewer could not locate the above listed reference in WGII SPM. [Harold David Tattershall, United States of America]	The references have been checked ard are correct. In the WGII SPM it is top of page 6 in the publication proof version.
Topic 2	65	7	65	7	read "terrestrial ecosystem" for "ecosystem" [Chaozong Xia, China]	It is clear from the context that this applies to the terrestrial ecosystem; since it also applies to other ecosystems, no ambiguity is introduced by leaving it as it is.
Topic 2	65	7			The figure on tree mortality, shown in the FGD of the WG2 SPM, Fig SPM.2 panel C should be given here. The figure should be modified in a way that clarifies that no red dots does not mean no effect, but no data, maybe by hatching those regions where data are lacking. The caption should not refer to "drought induced tree mortality" (as was done in the FGD of the WG2 SPM), but rather to "tree mortality induced by drought". The word "drought" at the beginning of the sentence has lead to confusion in Yokohama during the IPCC plenary. [Government of Germany]	We have considered the suggestion, but at the level of the synthesis report it is felt that it is too specific to a particular chapter in a particular WG to justify a figure here. The point is made in text.

Topic 2	65	8	65	8	To reflect the changes made to WGII SPM FD and make it consistent with the published WGII SPM (the first paragraph of page 16), this line needs to be written as follows: “associated forest dieback is projected to occur in many regions over the 21st century (medium confidence)” [Government of Japan]	Accepted and done.
Topic 2	65	12	65	13	What about pests or diseases that increase as a result of climate change? Have we evidence that tree mortality has increased dramatically due to infections by pathogens or pests, leading to even bigger ecosystem impacts? [Government of United States of America]	Text has been added to address this
Topic 2	65	12	65	21	We support the inclusion of the statement regarding coastal and low lying areas increasignly experiencing submergence, flooding and erosion due to sea level rise, in particular noting that human pressures will increase on coastal ecosystems. [Government of New Zealand]	Thanks for your supporting statement
Topic 2	65	18	65	20	This sentence seem to fit better into section 2.5.2, which concerns human systems. [Government of Norway]	This reviewer may have missed that 2.5.1. is about ecosystem services for humankind as well and we would like to keep this together with the other marine issues.
Topic 2	65	18	65	21	For which RCP? [Government of Germany]	RCPs and associated risks are specified in Figure 2.6.

Topic 2	65	23	69	1	Water, food and urban systems, human health. Security and livelihood not summarized in the SPM 1. We propose to add one or more of these conclusions: 1. Freshwater-related risks of climate change increase significantly with increasing greenhouse gas concentrations (robust evidence, high agreement). 2. Climate change over the 21st century is projected to reduce renewable surface water and groundwater resources significantly in most dry subtropical regions (robust evidence, high agreement), intensifying competition for water among sectors (limited evidence, medium agreement). 3. For the major crops (wheat, rice, and maize) in tropical and temperature regions, climate change without adaptation is projected to negatively impact production for local temperature increases of 2°C or more above late-20th-century levels, although individual locations may benefit (medium confidence). 4. Heat stress, extreme precipitation, sea level rise, inland and coastal flooding, drought, landslides, air pollution, and water scarcity pose risks in urban areas for people, economies, and ecosystems, with risks amplified for those lacking essential infrastructure and services or living in exposed areas (very high confidence). 5. Rural areas will experience major impacts on water availability and supply, food security, infrastructure, and agricultural incomes, including shifts in the production areas of food and non-food crops around the world (high confidence). 6. For most economic sectors, the impacts of changes in population, age structure, income, technology, relative prices, lifestyle, regulation, and governance are projected to be large relative to the impacts of climate change (medium evidence, high agreement). 7. Climate change is expected to lead to increases in ill-health in many regions, especially in developing countries with low income (high confidence). Up to mid-century, the impact will mainly be through exacerbating health problems that already exist (very high confidence). 8. Climate change is projected to increase displacement of people (medium evidence, high agreement). 9. Climate change can indirectly increase risks of violent conflicts in the form of civil war and intergroup violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks (medium confidence). 10. Climate change impacts are projected to slow economic growth, make poverty reduction more difficult, further erode food security, and prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger (medium confidence). [Government of Netherlands]	Noted. All 10 proposed conclusions are already covered in the SYR draft for this section and thus provide the basis for the SPM.
Topic 2	65	23	69	1	2.5.2 Water, Food and urban systems, human health, security and livelihoods: could connect the terrestrial food with marine food production (marine capture fisheries) in section 2.5.1, and figure 2.7 in order to have a comprehensive, but still concise paragraph on food production [Lena Menzel, Germany]	For topic 1 , we provide these 2 distinct sub-sections (risk for biophysical systems and human systems/actions) to lay out the various catagories (correct, with food split), but in the SPM for the SYR, the food components are combined.

Topic 2	65	25	65	26	could add 'worldwide' here; "…security and wellbeing worldwide, not only in low income…" [Stewart Cohen, Canada]	Recommend change to "…human security and wellbeing, in both developing and developed countries" - this then follows the agreement from the WGII approval session.
Topic 2	65	25	65	26	The income-based country classification, which is not clear in meaning, tends to be confusing. It is suggested to reformulate “not only in low- income countries” as “especially in developing countries”. [Government of China]	This part of the sentence is revised as explained in response to #T2-143.
Topic 2	65	25	65	26	Apart from low-income countries, what kind of countries are facing climate change challenges? [Qiyong Liu, China]	All countries face climate change challenges. This is very clearly shown in the WGII report.
Topic 2	65	26	65	26	To keep consistency with similar mention in SPM, consider deletion of "not only in low-income countries". [Government of Brazil]	See reponse to #T2-143.
Topic 2	65	28	65	28	"Freshwater-related risks" is vague. Suggestion: "River floodings and water scarcity increase significantly …" [Government of Netherlands]	agreed and reworded to read: Risks related to floodings or water scarcity increase significantly ...
Topic 2	65	28	65	31	The authors should consider adding 29.3 as another supporting Chapter reference. [Government of United States of America]	likely relates to p. 65, line 20 as well: reference to 29.4 added in both places
Topic 2	65	33	65	35	This statement is so broad that it's hard to see how it adds any value. [Government of United States of America]	line reference unclear for US statements: if correct for this section we feel that our statement is down to the point.
Topic 2	65	33	65	37	It would be interesting to show the impacts on water resources in different parts of the globe according to the scenarios RCPs. It could be in a similar way shown in the Figure 2.3 (b). [Government of Brazil]	Figure does not exist in underlying material. reference is to table 3.2. which provides the regional information.
Topic 2	65	33	65	42	An estimate of global total change of renewable water resources should be given here, although the changes in some regions are more crucial than some other regions. [Government of Switzerland]	reference is to table 3.2. which provides the global and the regional information. Added information that up to 2°C above the 1990s (GW 2.7°C) each degree of GW affects an additional 7% of the poulation with a 20% reduction in renewable water resources.

Topic 2	65	36	65	36	Here, it would be useful to also have a result following RCP2.6, if possible, to characterise the range of possible outcomes, under different scenarios. [Government of Sweden]	We introduced the information that up to 2°C above the 1990s (GW 2.7°C) each degree of GW affects an additional 7% of the poulation with a 20% reduction in renewable water resources
Topic 2	65	38	65	42	Suggest clarifying what is meant by “even with conventional treatment…”. Is this finding true for both developed and developing countries? [Government of Canada]	deleted the word "even"
Topic 2	65	40			to add the dry tropics regions should strengthen its adaptive policy at national and local level. [Government of Nicaragua]	dry tropical regions are in fact mentioned in line 36
Topic 2	65	44	65	44	Temperature' should read 'temperate' and the conclusion contradicts data presented in Figure 2.5 (see comment 4). [John R Porter, Denmark]	Accepted. Changed accordingly
Topic 2	65	44	65	44	Replace "temperature" by "temperate" [Government of France]	This typo has been corrected.
Topic 2	65	44	65	44	"temperature regions" should be changed to "temperate regions". [Keigo Akimoto, Japan]	This typo has been corrected.
Topic 2	65	44	65	46	The mension of wheat, maize and rice as major crops is not clear. It would be appropriate if the word " major" is dropped since even within the tropics alone, Major crops vary from region to region and even from country to country depending on whether they considered as food crops or cash crops [Government of Kenya]	Text now states "For wheat, maize, and rice in…."
Topic 2	65	44	65	46	"For the major crops (wheat, rice, and maize) in tropical and temperature regions" should probably read "in tropical and temperate regions". [Government of Brazil]	Accepted. Changed accordingly
Topic 2	65	44	65	52	What about the pressure on crops from competition by biofuels? [European Union]	This is beyond the scope of the assessment. The SPM WGII has no reference to biofuels either.
Topic 2	65	44	66	3	Is the intention to speak about tropical and TEMPERATE regions, or is temperature region really a concept? [European Union]	Accepted. Changed accordingly
Topic 2	65	44			"… in tropical and temperature regions, …" should be "… in tropical and TEMPERATE regions …" [David Wratt, New Zealand]	Accepted. Changed accordingly
Topic 2	65	44			Please substitute "temperature" by "temperate". [Government of Germany]	Accepted. Changed accordingly
Topic 2	65	46			Word "may" is vague and make this sentence ambiguous. Either take it out or provide more concrete example such as "although several locations will benefit". [Government of Netherlands]	This is approved language from WGII SPM.

Topic 2	65	47	65	51	From my understandings, Figure 2.8 is obtained from the simple average of changes in food productivity including different emission scenarios and regions. This sentence will never be lead from the figure. The sentence should be revised or removed.. In addition, how do you lead "Global temperature increase of -4 degrees C or more above late-20th-century level (…)" from Figures 2.5 and 2.8? There are no information relating this sentence in Figure 2.5 as well as Figure 2.8. Figure 2.5 shows the expert judgment for 4 degrees C above pre-industrial level. [Keigo Akimoto, Japan]	Both the figure and the caption were extensively discussed at the WGII approval session in Japan in March, and the version presented here IS what was approved. It is indeed the best assessment to date. The reference to 4 degree C is a synthetic statement based on Figures 7-4 and 7-7 in the underlying chapter 7 in WGII.
Topic 2	65	49	65	51	As this part is approved sentence from the WGII SPM, we would respect the current explanation. However, we would like to submit a question as below for better understanding of policy makers. “Wonder which part of the report is the basis of the text “Global temperature increase of -4°C or more above late-20th-century level (…)”. We have scanned through all the references made here, but could not identify the corresponding information.” [Government of Japan]	The reference to 4 degree C is a synthetic statement based on Figures 7-4 and 7-7 in the underlying chapter 7 in WGII.
Topic 2	65	53	65	53	Include a new paragraph: All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability (high confidence). [Government of Bolivia]	Thank you - now included.
Topic 2	66	0			Figure 2.8 : The dashes on the color legend should be changed to "to" in order to avoid "- -" for negatives values [Thomas Stocker/ WGI TSU, Switzerland]	Changes made, thank you.
Topic 2	66	1	66	8	Hopeless figure. Why show negatives and positives next to one another. Just weight the results by importance (e.g., calories) and add them up. Remove the studies without adaptation as these are irrelevant. [Richard Tol, United Kingdom]	The positives and negatives together add up to all projections (100%). This version was approved for WGII SPM.
Topic 2	66	1	66	8	Figure 2.8. This Figure is difficult to understand. What do the two color systems stand for concerning increase and decrease in yields? Besides, the procedure for aggregation of crop yields needs to be explained. It does not really make sense to mix rice with millet or potatoes to derive an aggregate yields, as the weight of the biomass, values and nutrition contents are very different among different crops. [Government of Switzerland]	The blue ranges depict increases of yields, and the orange ranges decreases in yields, in percentages. The purpose in this figure was to show aggregates, as differences in yields between different crops would be the same across levels of increase and decrease. This figure has been approved for the WGII SPM.

Topic 2	66	2	66	8	Caption of Figure 2.8: This caption is very difficult to follow and needs clarification. Please consider rewriting it. [Government of Norway]	We acknowledge the limitations of the caption, but this is the text that was approved after several rounds of discussion for the SPM in Japan.
Topic 2	66	2	66	8	Figure caption typos: second line "temperature" should be "temperate", second last line " date" should be "data" [Lena Menzel, Germany]	Both typos have been corrected.
Topic 2	66	2			Please clarify in the caption which crops are covered by this diagram - is it for just wheat, rice and maize as mentioned in the text at the bottom of the previous page. (I note that at a recent IPCC outreach event I attended in Samoa the participants pointed out that none of the crops referred to in the WG2 SPM are important for small tropical islands such as theirs. They were worried about taro - they don't grow wheat, rice or potatoes). Of course what the IPCC can discuss is limited to what is in the literature - but nevertheless it would be helpful to specify which crops are being considered. [David Wratt, New Zealand]	The four most prominent crops covered in the data sets are now listed.
Topic 2	66	3	66	3	Replace "temperature" by "temperate" [Government of France]	Yes, typo has been corrected.
Topic 2	66	3	66	3	Should read "for tropical and temperate regions" [Government of Brazil]	Yes, typo has been corrected.
Topic 2	66	3	66	4	Adaptation and non-adaptation cases should be displayed separately, for clarity. [Government of Sweden]	Unfortunately, not all studies specify whether or not they include adaptation, and if they do, how they treat it. There is too little data for such a split to be robust. Hence, the approved approach to keep all cases combined.
Topic 2	66	3			Please substitute "temperature" by "temperate". [Government of Germany]	Yes, typo has been corrected.
Topic 2	66	10	66	13	I think this is the same wording that appears in the SPM and on which I have commented above as follows: But a lot of these are risks even in the absence of anthropogenic climate change and for some (e.g. drought) it is not clear how climate change would affect these. I guess I'm not really sure what the value of this sentence is without some clarification that we are talking on the most part of an 'enhancement" of these risks in the future due to climate change and other risk factors. [Lisa Alexander, Australia]	This sentence has been modified to speak specifically to the increased risks due to climate change, as describe din the underlying text of Ch 8 (urban areas).
Topic 2	66	10	66	13	At the end of the paraghraph, it would be better to explain more about climate change effects on natural disasters and environmental pollutions. [Qiyong Liu, China]	These two examples are not included in the approved SPM for WGII, in this context.

Topic 2	66	10	66	13	Vulnerability and adaptation of people living in rural and remote areas should be also indicated. [Qiyong Liu, China]	This section deals with future risks and impacts. Adaptation is covered in Section 3, and vulnerability addressed earlier in the SYR.
Topic 2	66	10	66	13	There is no mention of the relation of these impacts to climate change in this bolded statement. Suggest revising to make more clear how climate change affects these issues. [Government of Canada]	This sentence has been modified to speak specifically to the increased risks due to climate change, as describe din the underlying text of Ch 8 (urban areas).
Topic 2	66	10	66	13	Figure 2.8: This figure is very difficult to comprehend. The colors make sense. But, is each block of color within a bar designate a different region? A combination graph would make more sense to me. Perhaps start with a pie chart instead of having to bars (blue and orange). Then have an arrow coming out from the pie chart leading to a more detailed bar graph to see the differences in magnitude of the decrease or increase in yield. [Government of United States of America]	We recognize the limitations of the figure, but among several figures from WGII Ch7, this is the one the authors felt was most informative, with a solid number of underlying data points, and it was approved for the SPM. We cannot introduce a new figure now that hasn't gone through approval in WGII.
Topic 2	66	10	66	13	This is an unnecessary and uninformative statement that is true regardless of climate change. The authors should put this finding in the context of climate change or remove the statement entirely. [Government of United States of America]	This sentence has been modified to speak specifically to the increased risks due to climate change, as describe din the underlying text of Ch 8 (urban areas).
Topic 2	66	12	66	12	What kind of sevices are lacking? Publich health services? Or social service? Please specify. [Qiyong Liu, China]	Services include educational and health services, household solid waste collection, and emergency services. Details on infrastructure and services are in the underlying Ch 8 (Urban areas).
Topic 2	66	18	66	18	The authors should consider adding WGII 5.3-4 as supporting chapter reference. [Government of United States of America]	5.4 is now added.

Topic 2	66	18			"Female-headed households": Does this refer to households, where men and women cooperate in a modern way, i.e. instead of the man it is the woman who is the decision maker of the family? Or does it rather mean "single-headed households"? Please use gender-neutral language. [Government of Germany]	We do mean female-headed households as understood in the literature, lead by women in the de jure or de facto absence of a man. Such households are indeed among those more adversely affected. Gender-neutral language would obscure this inequality.
Topic 2	66	21	66	27	The claim that climate change impact on majority of economic sectors are going to be insignificant is not entirely correct. The impact of extreme weather event can have systemic impact and paralyse industries. This claim might hold in the near future but in this case it should be stated. [European Union]	The focus here is on climate change and not weather events. Furthermore, scant evidence exists that would substantiate structural and long-lasting impacts of extreme weather events. Hence, the bold sentence, as approved for the WGII SPM.
Topic 2	66	21	67	11	The para on P 66 L 21-27 puts the impacts on climate change in the context of other factors, and from this perspective the impacts on sectors are relatively smaller, now and in the future. The para on P 67 L 66-11 takes the macro-economic perspective and describes significant impacts of climate change on all sectors. This is very confusing, please reconsider your presentation. [Government of Germany]	We have changed the order of the chapter results, with the aggregate economic losses (Ch10) first, followed by risks from a poverty perspective (Ch13). This enhances the flow and shows consistency of results between the chapters.
Topic 2	66	26	66	26	To keep consistence with the discussions at the WGII-10 and WGIII-12, replace "particularly in low- and middle-income countries" with "particularly in developing countries". [Government of Brazil]	Corrected to "particularly in developing countries", as approved in the SPM.
Topic 2	66	29	66	36	This is an important statement that should precede all other summaries of socioeconomic impacts. [Government of United States of America]	Our intention is not to rank the statements by order of importance, as this would be highly subjective. Nonetheless, we have enhanced the coherence in the flow of the paragraphs.

Topic 2	66	29	67	11	Editorial Improvement: Paragraphs in this area commonly starting with the same word, Climate Change, with different main messages and subjects. Therefore it would be much nicer to revise these paragraphs with more informative and impressive expression which would be better to choose words in more relevance to the main messages of each paragraph…. On this way this area will be more readable with better presentations. [Government of Republic of Korea]	Our intent is to follow language that is already approved in the SPM. Although we acknowledge that this may compromise elegance.
Topic 2	66	31	66	32	Apart from water-borne and food-borne diseases, climate change also has had a negative impacts on vetor-borne diseases worldwide. [Qiyong Liu, China]	Vector-borne diseases are mentioned in the 4th sentence of the health paragraph.
Topic 2	66	33	66	34	Please delete "and reduced capacity of disease carrying vectors" because the vectors have no influence on cold related mortality. [Government of Germany]	This part of the sentence has been modified.
Topic 2	66	33	66	34	Is it correct that 'reduced capacity of disease-carrying vectors' in this context means 'reduced capacity of vectors to transmit diseases'. Could it be phrased more precisely? [Government of Switzerland]	This part of the sentence has been changed.
Topic 2	66	33	66	36	Comment: We find it unsuitable to assume and generalize that the global conditions for arthropod vectors will be negatively influenced by climate change. Even if this is true in some areas, it will likely be much more common that vectors will be positively influenced and expand their range and disease carrying capacity. New suggestion: ….Fewer cold extremes are expected to result in modestly lower cold-related mortality and morbidity in some areas (medium confidence). Potentially disease-carrying arthropod vectors and reservoir animals in many regions are expected to expand their geographical distribution, population density, biting rate, etc. thereby increasing the risk for vector-borne diseases. However, in some areas and for some species, a reduced capacity of disease-carrying vectors may be seen when humidity is markedly reduced and temperature is getting to high (medium confidence). Globally, positive impacts are projected to be outweighed by the magnitude and severity of negative impacts (high confidence). [Government of Sweden]	Thanks you for the detailed suggestion. We have taken up the gist of your suggestion, consistent with chapter findings, but due to space constraints cannot use the full wording for the SYR. Details are found in the underlying chapter 11, WGII. (wording to the right approved by Alistair, and Kris).
Topic 2	66	38	66	38	It woulld beeter to replace the word "displacement" by "migration" [JACQUES ANDRE NDIONE, SENEGAL]	Displacement is correct here, also approved in the SPM. Migration can also be seen as an adaptation strategy, hence is ambiguous in terms of future impacts.
Topic 2	66	40	66	41	The implication here is that all "extreme events" are expected to change which we know is not true from WGI Chapter 11, 12 and 14. It would be good to specify what extreme events are being talked about here and which ones aren't. [Lisa Alexander, Australia]	We now say "extreme events, such as floods and droughts, …..", supported by chapter text in FAQ 12.3.

Topic 2	66	41	66	43	at the end of the sentence add "(high confidence)" as it is written in WGII chpt. 19 page 3. [Government of Netherlands]	This would only apply to the second half of the sentence, as the first part comes from Ch 12 with the confidence level indicated after the bold statement, meaning it applies to the rest of the paragraph.
Topic 2	66		66		Figure 2.8 needs better explanations. [Government of Sweden]	We have provided the best explanation that met approval in the WGII SPM in Japan, after several rounds of discussion.
Topic 2	66				Figure 2.8 Delete the figure. The number of papers is NOT scientific probability. Using the number of projections as indicator of the ratio between good vs. bad impacts is simply WRONG. [Taishi SUGIYAMA, Japan]	This was the best figure on crop yields that was approved in the WGII SPM, as it is, and hence cannot be altered at this point. .
Topic 2	66				Figure 2.8. Lables for the colour legend on the right of the figure are faint. Consider enhancing them [Government of Kenya]	This is the approved figure, including colors that cannot be changed at this point.
Topic 2	67	1	67	4	The bolded first sentence "Climate change is projected to increase displacement of people" is too simplistic a summary of how nuanced and complex the subject of climate related migration actually is, as illustrated in Chapter 12, Section 4 of WGII. Much like conflict, there are multiple drivers for why and when people choose to migrate. For example, section 12.4.1.2, page 13 states "There is some evidence that climate changes, through impacts on productivity, can lead to reductions in migration flows." I suggest that the authors re-review Chapter 12, Section 4 and re-write this summary to more accurately reflect the underlying chapter. [Government of United States of America]	There is an important difference between displacement and migration in Ch 12. sentence has been approved in the WGII SPM.

Topic 2	67	5	67	10	The heading of the paragraph states 'Climate change impacts are projected to slow economic growth……'. The text below should give some elaboration on the mechanisms through which these impacts can slow economic growth. The exacerbation of poverty in some countries does not necessarily lead to a slow down of global economic growth. [Government of Switzerland]	Ch 13 provides the necessary details - economic growth is measured mainly through economic growth models and impacts on GDP (also reported in Ch 10, see Table 10 B1). Poverty estimates are based on both non-disaggregated poverty data (poor people per country based on the World Bank $1.25/day) and disaggregated poverty head counts, for instance by occupational class, also taking into account the intensity of poverty (e.g. shift from transient to chronic poverty). Indeed, these are two different measures. However, explaining these differences within the space constraints of the SYR is not possible.
Topic 2	67	6	67	8	Please remove the reference to poverty traps. It is in the SPM of the WG2 report, and in Chapter 13, but I don't think it is supported by the literature. Chapter 13 refers to two papers, neither of which considers poverty traps. [Richard Tol, United Kingdom]	Ch 13 also reports on poverty traps in the context of growing numbers of urban poor, esp. those dependent on wage labor, due to expected rises in food prices, especially but not exclusively as a result of increased frequency and severity of extreme events (see work by Hertel et al and Ahmed et al). See section 13.2.2.4 top.
Topic 2	67	6	67	8	Regarding this statement about climate change slowing economic growth, is there any further discussion that could be added here about how this may in turn impact climate change (e.g., will slowed economic growth in turn slow the rate of climate change)? [Government of Canada]	No reliable literature on this feedback emerged during the review as adaptation actions remain uncertain.
Topic 2	67	6	67	11	The analysis is very robust and relevant [JACQUES ANDRE NDIONE, SENEGAL]	Thank you!

Topic 2	67	13	69	1	Table 2.3: This table is really important and we are very happy to see it included in the SYR. To get a full picture of what human society has to tackle concerning climate change it is important not only to show the regional risks, but also the global risks. [Government of Norway]	Accepted, statement on droughts added
Topic 2	67	13	69	1	Table 2.3: This table is global part of WGII TS Table .4, and it would be better to move page 60. The WGII TS Table .4 is divided into two as Global and Regional, and they are presented in as table and figure in order to avoid to putting a very long and complicated original table. Presentation seems better than the original table and considering the contents of the section 2.5 it would be better put earlier rather than in the middle of the section. [Government of Republic of Korea]	It is correct that our intention is to break up a very long original table from the WGII TS. We prefer having this table at the end of 2.5 to provide more detail than what the introductory figure (examples of regional risks) can deliver.
Topic 2	67	17	67	17	What does "acknowledging" mean? That it has been included in the assessment or just that it such diffrences exist and should be kept in mind when reading the figure? [Government of Sweden]	Both - the differences within the chapter team members and for the readers.
Topic 2	68	1	69	1	These tables are not easy to interpret or understand. There is no caption or figure number present. [European Union]	The assesemnt is done across scenarios. It is estimated from the return period of 1986–2005 20-year return values of annual maximum daily precipitation corresponding to 1°C of local warming,
Topic 2	68	1	69	1	This bullet incorrectly states that climate change impacts are expected to exacerbate poverty in most developing countries and create new poverty pockets in countries with increasing inequality. However, WG II 10.9.2.3, which is cited as the source of this statement, says that "the literature on climate change and economic development has not reached firm conclusions on anything other than the slowing of economic growth - by a little in some, by a lot in others -" and that "there is disagreement on whether climate change will affect the nature of economic development, with some suggesting that more people may be trapped in poverty." [Government of United States of America]	Chapters 10 and 13 are not in disagreement on impacts on economic growth. Ch10 (see Table 10B1) shows overwhelming negative impacts on GDP across 18 studies, using different methods, presented as welfare losses or aggregate economic losses. These losses range from -0.4% to -11.5% (16 studies) on the negative side and 0.0% to +2.3% on the positive side (2 studies).

Topic 2	68	1	69	1	Define "boreal tipping point" and "Amazon tipping point". Why is there is NO potential for adaptation to reduce risks in Arctic ecosystems? Does the IPCC imply there is no potential to reduce risk there at all? [Government of United States of America]	The term 'tipping point' is defined in the glossary. There is in fact a brief explanation of both in the table, more details of the two postulated tipping points are in the sections of WGII ch 4 referenced in the table, as are the reasons why the adaptation potential (NOT mitigation potential, as incorrectly stated in the comment) is evaluated as minimal.
Topic 2	68		68		Table 2.3 4th risk: "A large fraction of the species assessed…" Is this correct? Has the report assessed species? Or scientific litterature of studies on different species? If the latter, then please consider to rephrase to "species assessed in the literature". In addition, please also consider changing "often in interaction with other threats" to "in interaction with other threats" since climate change rarely works in solitude. [Government of Norway]	Yes, this has been assessed in the literature. This text has been approved.
Topic 2	68		69		Table 2.3: suggest to reduce text as much as possible, e.g., instead of "Reduction in terrestrial carbon sink: Carbon stored in terrestrial ecosystems is vulnerable to loss back into the atmosphere, resulting from", say "Terrestrial carbon may be relased due to..." etc. [Government of Hungary]	This is text already approved from WGII, see TS.
Topic 2	68		69		Table 2.3. Please add coastal erosion to the table. The cost of coastal protection following erosion and flooding are very high, hence coastal erosion is also a key risk. [Government of Denmark]	Coastal erosion is not in the approved table in WGII, TS, and hence we cannot add it at this point.
Topic 2	68				Table 2.3 Delete the table. The risk level judgement in the table is subjective as it is based on expert judgement. As such, it is not falsifiable and we can not regard it as a scientific finding. Should you keep it despite this comment, make it very clear that "This risk level judgement is subjective as it is based on expert judgement". [Taishi SUGIYAMA, Japan]	The table is fundamental for the SYR. It uses the same assessment as Fig 2.5. The introduction to the SYR explains the importance and necessity of expert/value judgments in assessing risks.
Topic 2	68				Table 2.3 Font used for both text and labels is too small and faint. Consider increasing the font size and also enhancement [Government of Kenya]	Font sizes are now harmonized, to the best ability of the graphic artist.
Topic 2	68				In Table 2.3 CHANGE: “Marine biodiversity loss with [DELETE: high rate of] climate change.” Table shows near-term above medium, no adaptation. ADD: Emergency [Peter Carter, Canada]	The rate of change is important and needs to be kept in the table. We don't understand the comment on emergency.

Topic 2	69	6	69	7	Many irreversible changes have already occurred (e.g. sea level rise). This statement suggests that irreversible changes are all into the future. [European Union]	This section is about future projections
Topic 2	69	9	69	12	Suggest that this first paragraph under the heading of long-term irreversible and abrupt changes should be set up to make the following points: 1. stabilizing radiative forcing would lead to continued global warming for many centuries, and 2. to stabilize global avg temperature, emissions needs to be reduced to zero consistent with WGI results about there being a finite carbon budget (or cumulative carbon emission limit) associated with different magnitudes of warming, 3. that even after a complete cessation of net anthropogenic CO2 emissions, surface temperatures will remain approximately constant at elevated levels for many centuries. [Government of Canada]	This material covered in the first two paragraphs
Topic 2	69	9	72	12	Section 2.6: Clearly authors may have looked at WGI AR with great efforts, particularly Chapter 12, but it would have been better if this section is more focused on what has been treated in WGI SPM E and TS 5.5 ~ 5.7 as more important subjects seem treated in both WGI SPM E and TS. In addition, long-term climate change would also be better treated as observed climate changes with more cases and phenomena with relevant level of confidences in balance of projected climate change, stabilization and irreversibility. [Government of Republic of Korea]	Material from WGI SPM added.
Topic 2	69	10	69	10	Table on 68-69 hard to digest but good info; reformat to make columns all parallel and each column have same width through the table (not all columns same, just get that first column to be the same width all the way down and ditto for the second). [Government of United States of America]	Font sizes are now harmonized, to the best ability of the graphic artist.
Topic 2	69	11	69	12	Recommend replacing this sentence with one that simply states that warming will continue for centuries even once radiative forcing is stabilized, consistent with what is shown in Figure 2.9. [Government of Canada]	Accepted - wording changed.
Topic 2	69		69		Table 2.3 13th risk: Please include "and increasing" before "morbidity" to generate "Declining work productivity and increasing morbidity (e.g. ….) and mortality", if not declining morbidity and mortality is the risk referred to. [Government of Norway]	Suggestion taken up and included by the graphic artist.
Topic 2	69		72		Section 2.6. is highly appreciated. It is important information that climate change does not stop at the year 2100. [Government of Germany]	Thank you

Topic 2	69				Table 2.3, key risk - Urban risks associated with energy systems; why is risk for Near-term greater than risk for long-term 2°C? [Stewart Cohen, Canada]	The logic is that in the long-term there will be more adaptation initiatives for critical energy systems that will not be realized (or at least not at a sufficient extent) in the near-term.
Topic 2	69				Table 2.3 Font used for both text and labels is too small and faint. Consider increasing the font size and also enhancement [Government of Kenya]	Font sizes are now harmonized, to the best ability of the graphic artist.
Topic 2	69				Table 2.3. On "Displacement associate with extreme events" add "flooding"-Symbol as climate driver: Rational: Flooding can also play a role for "violent conflict …", as does storm surge. [Government of Germany]	The icon for flooding is not explicit in the approved chapter table but implicitly included under extreme precipitation and storm surges.

Topic 2	69				Table 2.3 With regard to the table, and the sections covering 'Displacement' and 'Violent Conflict', both are shown as 'very low' in the 'present column'. The world food riots of 2008 and the onset of the Arab Spring in 2011 are recorded history that refutes this classification. Further, when Kofi Annan, as a specially appointed envoy from the UN, went to Syria following that uprising, he identified the immediate need for food and water for 1.1 million people displaced in part by a sustained drought and consequential widespread crop failures. There are now in excess of 6 million Syrians requiring aid and the conflict continues to escalate. On that basis 'very low' for either category is highly questionable. Added to the above is the threshold for conflict that was identified in research by Complex Systems Institute of New England as a level of 210 for the UN FAO Food Price Index http://necsi.edu/research/social/foodprices/update/, plus considerable reported evidence of refugees crossing the Mediterranean and NATO strategy meetings regarding northern migration problems looming in Europe at a minimum. The UN FAO Food Price Index is readily available data and the trends of that data, in tandem with scientific projections of a forward decline in world agricultural production, would seem to conflict with an assessment of 'very low'. This categorization would appear to be based on dated data that forecast continually increasing food production throughout the first half of the 21st century due to extended growing seasons and increased yields resulting from elevated atmospheric CO2 levels. The realities do not match these assessments and potentially the policy makers may not be apprised of critical information necessary to make decisions or advise sectors of their societies that may be disrupted due entirely to forward resource scarcity. [Harold David Tattershall, United States of America]	This is the judgment of the chapter authors based on available literature, on a global level, and not for specific 'hotspots'.
Topic 2	70	1	70	1	What is the significance of "carbon dioxide alone"? Would there be a decisive difference for scenarios driven by multigas(es), of which most probably would consist of CO2? [Government of Sweden]	Reworded to take acount of comment
Topic 2	70	1	70	1	What is the use to the reader of a scenario driven by carbon dioxide alone? Can we say "If greenhouse gas emissions ceased completely…" [Government of United Kingdom of Great Britain & Northern Ireland]	Reworded to take acount of comment
Topic 2	70	1	70	2	Could you consider to replace this sentence with a sentence that describes how the temperature evolves after 2100? Suggestion from WGI SPM: "Warming will continue beyond 2100 under all RCP scenarios except RCP2.6." [Government of Norway]	Sentence added.

Topic 2	70	1	70	2	The wording in this bolded header (about climate change commitment) is different than that in the executive summary to WGII Ch. 12. Here it says "….global avg temperature is projected to remain above the twentieth century average for many centuries following a complete cessation of emissions", whereas in Ch. 12 ExSumm it says "….global avg temperature is projected to remain approximately constant for many centuries following a complete cessation of emissions". This is quite a different conclusion. Perhaps the best wording is that on page 12-68 of Ch. 12 which says that there would be "persistent warming for hundreds of years continuing at about the level of warming that has been realized" (following cessation of emissions). [Government of Canada]	Adopted wording from the WGI SPM - "Surface temperatures will remain approximately constant at elevated levels for many centuries after a complete cessation of net anthropogenic CO2 emissions. "
Topic 2	70	3	70	4	We feel that findings related to "return to past regional temperature regimes" are not the most relevant (if it means below present global average temperature). Please consider to rephrase so that the message is more in line with terminology used in WGIII. A more policy relevant information would be to describe what is needed to stay below 2 degrees after 2100 and beyond. [Government of Norway]	This topic was covered in 2.4.5 (a cross reference has been added).
Topic 2	70	6	70	9	According to chapter 11 in WG III, slow growing forest ecosystem might be added to the list? Please consider adding "slow growing forest ecosystems" after "…., re-equilibrating soil carbon and carbon from". [Government of Norway]	Forests are implicitly included under biomes ao no change in text made.
Topic 2	70	10	70	10	Add reference WGI 12.5.4.3 [Government of Netherlands]	line of sight added
Topic 2	70	12	70	12	Should this sentence say that "ocean acidification will affect marine ecosystems for centuries "even if CO2 emissions cease" (vs. "if CO2 emissions continue")? This would be the more important message to give policymakers; that there is a long term commitment in terms of ocean acidification even once emissions are eliminated, in keeping with the discussion above about other aspects of climate change persisting even if emissions cease. [Government of Canada]	This point is well taken: Changed bold text to: Ocean acidification will increase for centuries if emissions continue, and will strongly affect marine ecosystems (high confidence), and the impact will be exacerbated by rising temperature extremes (Figure 2.6B).
Topic 2	70	12	70	12	Ocean acidification will affect marine ecosystems for centuries if emissions continue (high confidence).: would be helpful to emphasize that OA "will CONTINUE TO effect marine ecosystems", as ecosystems are already showing OA effects. Changes could be analogous to text some lines below (p70 line 26) "Global mean sea level rise will continue" [Lena Menzel, Germany]	This is not really needed as the timeline given expresses continuity in effects: Future effects will be more severe than present effects. (see last comment)

Topic 2	70	12	70	14	Is this statement consistent with the science parts of the WG1 report? Ex: in WG1, p. 71: "The existing modelling studies of permafrost carbon balance under future warming that take into account at least some of the essential permafrost-related processes do not yield consistent results, beyond the fact that present-day permafrost will become a net emitter of carbon during the 21st century under plausible future warming scenarios (low confidence)." WG1, Table 12.4. (p. 1115): "Possible that permafrost will become a net source of atmospheric greenhouse gases (low confidence)". If it is low confidence, why is it stated here with no confidence qualifiers? Why is it even stated here at all? [Government of United States of America]	Probably meant to be page 72, lines 8-12; This has been reworded. Low confidence added, and some material deleted.
Topic 2	70	12	70	14	Ocean acidification will affect marine ecosystems for centuries if emissions continue (high confidence): OA is caused by rising CO2 levels, but other drivers acting synergistically exacerbate OA effects on organisms and ecosystems. For example, the synergistic effect of OA and warming put marine organisms to a risk at lower CO2 levels than if just CO2 was the driver (SYR figure 2.6B, page 62) [Lena Menzel, Germany]	This point is well taken. We have added at the end of the bold statement: ...the impact will be exacerbated by rising temperature extremes (Figure 2.6B).
Topic 2	70	13	70	13	Ocean acidification should be singular [Elvira Poloczanska, Australia]	noted and corrected
Topic 2	70	13	70	13	acidification, not acidifications [Peter Thorne, Norway]	noted and corrected
Topic 2	70	14	70	14	WGII Chp 30 also presents extensive discussion of ocean acidication projections (30.3.2.2), please add to refs [Elvira Poloczanska, Australia]	added to reference list
Topic 2	70	14	70	14	CC-OA' : unkown abreviation [Government of Netherlands]	CC-OA: cross chapter box on ocean acidification, typical reference in WGII report. changed into WGII CC-OA
Topic 2	70	16	70	20	Please make this statement understandable when reading also page 32 lines 47-49, i.e. how this bullet goes together with the latter, and make sure all is well picked up in Article 2 Box [Andreas Fischlin, Switzerland]	Much of statment moved to section 2.4.
Topic 2	70	16	70	34	This part should describe the information of RCP4.5 and RCP6.0, not limiting only RCP2.6 and RCP8.5. [Hirofumi Kazuno, Japan]	Insufficient space to include all scaenarios. - just the range given.
Topic 2	70	18	70	18	RCP8. should be RCP8.5 [Government of Japan]	Much of statment moved to section 2.4. and corrected. Thank you
Topic 2	70	18	70	18	8.5! [Peter Thorne, Norway]	Much of statment moved to section 2.4. and corrected. Thank you
Topic 2	70	18	70	18	typo: should be "RCP8.5" [Government of Netherlands]	Much of statment moved to section 2.4. and corrected. Thank you

Topic 2	70	18	70	18	Typographical error: "RCP8." should be "RCP8.5" [Government of Canada]	Much of statment moved to section 2.4. and corrected. Thank you
Topic 2	70	19	70	20	Last part of sentence states that "it is unlikely that the AMOC will collapse beyond the 21st century for the scenarios considered", but WGI and the SPM state that "a collapse beyond the 21st century for large sustained warming cannot be excluded". Need to ensure coherence between statements. [European Union]	Adopted WGI SPM statment
Topic 2	70	20	70	20	add and change references "{WGI SPM, Box 5-1, Table 12.4, 12.4.7.2, 12.5.5.2}" [Government of Netherlands]	text modified to refer directly to the WGI SPM
Topic 2	70	22	70	24	The report states "Ocean acidification is caused by rising atmospheric CO2...". This is not correct and further contradicts the text shown in page 32 (line 51). Ocean acidification is caused by the ABSORPTION of atmospheric CO2. Further, the ocean could be saturated in CO2 and become a source of CO2 for the atmosphere (as is already happening in a small area of the Arctic ocean north of Siberia). This does not fit in the stated text quoted above. [Government of United States of America]	suggest replacing with something like: Ocean acidification is caused by the entry of atmospheric CO2 into surface waters...
Topic 2	70	22	70	24	Very unclear senstence. Is this talking about little evidence for tipping points (which would affect other aspects of the report)? This should be stated clearly. Also add confidence levels [Government of Netherlands]	Reworded by directly referring to a tipping point.
Topic 2	70	22	70	24	It is useful to know that there is no threshold in the transition from a perennially ice-covered Arctic Ocean to a seasonally ice-free one, beyond which further sea ice loss is unstoppable. This implies that sea ice could recover if cooler conditions prevailed. However, given that the text above these lines on page 70 emphasize the persistence of elevated global (and, by implication, Arctic) temperatures, can it be said that the loss of seasonal Arctic Ocean ice cover is effectively irreversible (using the phrasing from the bolded sentence on line 10 of page 69)? If so, it would be helpful to have that stated here. [Government of Canada]	Suggestion not adopted as it is not strictly traceable to the underlying document,
Topic 2	70	32	70	34	Can a range be provided for estimated Antarctic ice sheet contribution? [European Union]	This is too great a level of detail to include here. A reference to the relevant section of WGI has been added.
Topic 2	70	34	70	34	Add reference : WGI 13.4.4 [Government of Netherlands]	now included.
Topic 2	71	0	71	0	graph b: in y axis, indicate relative to when the air temperature changed [Government of Netherlands]	This has been added to the caption
Topic 2	71	0	71	0	graph c: in y axis, indicate relative to when sea level rose [Government of Netherlands]	To be added to caption - checking with Anders

Topic 2	71	0	71	0	graph c: add relevant colour and RCP numbers to the bars [Government of Netherlands]	These are not only RCP scenarios so RCP colours should not be used. A legend has been added to identify scenarios.
Topic 2	71	1	71	1	"Stabilization of radiative forcing" is too jargony. [Government of United States of America]	Actually page 69, line 11. This is an accurate descruiption. No change made.
Topic 2	71	1	71	1	Regarding panel c, consider colouring the bars, and give them annotations [Government of Denmark]	A legend has been added with grey shading
Topic 2	71	1	71	12	Figure 2.9: This figure seems not suit for the section 2.6 unless the existing content will be changed and focused on the subject belong to the Figure 2.9. Please remove it or revise the section 2.6. [Government of Republic of Korea]	The Figure is required by at least two paragraphs in section 2.6.
Topic 2	71	2	71	11	Baseline used for this figure is not given. It should be replotted using a preindustrial baseline, e.g. 1850-1900. In the current version, temperature rises under the RCP4.5 scenario reach 2 C above the baseline whereas this report discusses RCP2.6 as the only scenario which can limit global warming to 2 C or less. [European Union]	Reference period now included in the caption (1986-2005). But baseline not changed
Topic 2	71	4	71	4	What is the significance of the 10-year smoothing. The graphs would seem to suggest that there is not very much internannual/interdecadal variability in any case. [Government of Sweden]	The ten year smooting has effectively removed interannual variability.
Topic 2	71	4			Figure 2.9. "and bars" should be deleted because bars are not shown in Figure 2.9. Also, in panel a, "ppmv" in the y-axis label is to be replaced with "ppm" for consistency. [Government of Japan]	First reference to bars deleted. Bar are used in Fig 2.9c. Ppmv is as used in the underlying figure - (WGI Fig 12.43)
Topic 2	71	10	71	10	Shouldn't "likely" be written in italic ? [Thomas Stocker/ WGI TSU, Switzerland]	corrected. Thank you
Topic 2	71	14	71	14	replace vague word "some" by for example "unknown" or more specific value. [Government of Netherlands]	Changed "some" to "a"
Topic 2	71		71		Fig. 2.9: panel (c) is not elegant nor easy to read, try to make it more accessible, maybe plot a mean/median for each concentration group and points for a range in stead of bars. Add the number of models used to do the analysis (see WGI table 13.7 and 13.8) [Government of Netherlands]	There are a different number of models for each component contributing to total sea level. In this case the most meaningful information is the range as plotted.
Topic 2	71		71		Figure 2.9 should give the numbers of the models. [Zong-Ci Zhao, China]	There are a different number of models for each component contributing to total sea level. In this case the most meaningful information is the range as plotted.

Topic 2	71				figure 2.9: Caption (c) - The wording: "sea level change projections grouped into three categories according to the concentration of GHG in the year 2100" lacks clarity. This is because as reflected in figure (a) atmospheric concentrations will change over time until 2300 and remain stable only after 2300. It is suggested to delete "in the year 2100", provided that the concentration pathways as shown in panel (a) have been driving the modelling of sea level rise. [Government of Austria]	A range of different scenarios have been used, not just the RCPs and therefore the phrase is required.
Topic 2	71				Figure 2.9: The caption should also explain why concentrations in RCP2.6 decline but continue to increase in the other RCPs. [Government of Austria]	This is the definition of RCP2.6 - a strong mitigation scenario.
Topic 2	71				Figure 2.9: For panel (b) the reference level for the change in temperature should be specified in the explanation of the y-axis. [Government of Austria]	Now included in the caption
Topic 2	71				Figure 2.9. To use different three colours are suggested to show projections for the three categories (low, middle, high) in panel c. [Government of Japan]	A legend using shading has been added.
Topic 2	71				Panel (c) would be easier to read if the columns were colour coded and there was a legend. [Government of Netherlands]	A legend using shading has been added.
Topic 2	72	1	72	6	I always thought that the effects described here could also have substantial C cycle feedbacks that might further accelerate warming. If my presumption is correct, I think it should be discussed here. [Helmut Haberl, Austria]	While here is a positive feedback, the estimated contribution by 2100 is small relative to GHG emissions.
Topic 2	72	1	72	6	This section does not discuss possible large increases in methane emissions from gas hydrates, wetlands or permafrost. [European Union]	While here is a positive feedback, the estimated contribution by 2100 is small relative to GHG emissions.
Topic 2	72	1	72	12	These two paras are very important, but the information would also be relevant for section 2.5.1. [Government of Germany]	We will only cover them in one place.
Topic 2	72	5	72	6	add to references: "WGII SPM B-2" [Government of Netherlands]	reference added
Topic 2	72	8	72	8	We cannot find in the AR5 reports that the reduction is (virtualy certain) 'irreversible' please provide reference [Government of Netherlands]	Reworded. It is the irreversible loss of carbon that is the focus.
Topic 2	72	8	72	12	Is this feedback included in models? How does this affect future mitigation possibilities? This feedback seems crucial. [Government of Netherlands]	This sentence has been deleted
Topic 2	72	9	72	10	is: "within decades", should read: "within decades-to-centuries" to be consistent with box 5.1 and table 12.4 [Government of Netherlands]	This sentence has been deleted

Topic 2	72	9	72	11	The wording here suggests an abrupt release of sizeable amounts of previously frozen carbon from thawing permafrost within a decade of thaw. WGI concluded that an abrupt release of permafrost carbon is not expected. Note that it is not just a reduction in areal extent of permafrost that is important but also a reduction in vertical extent. Increased summer thaw and degradation of the upper few meters of permafrost can have implications for carbon budget. Consider clarifying. Also, the text should make reference to emissions as CO2 and CH4 . It is important to state both CO2 and CH4 because they have different global warming potentials (and different atmospheric lifetimes) and because there is a widespread misconception that the predominant emission from permafrost is methane even though it is actually CO2, under most conditions. [Government of Canada]	This sentence has been deleted
Topic 2	72	10	72	11	at the end of the sentence add "(low confidence)" as it is written in WGI TFE.5 [Government of Netherlands]	Added.
Topic 2	72	11	72	12	add to references: "WGI TFE.5", precise from "WGI 12.5.5" to "WGI 12.5.5.4" [Government of Netherlands]	TFE 5 added. Line of sight only reported to two decimals.