

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

Chapter	From Page	From Line	To Page	To Line	Comment	Response
SPM	0	0	0	0	We think that the box on article 2 is very important and should be included in the SPM (in particular, it is linked to the text of section 3.3). If this is not possible the content of the Article 2 Box needs to be reflected more extensively in the SYR SPM, with at least a dozen lines. [Government of Belgium]	accepted
SPM	0	0	0	0	In few places, the authors use british spelling (eg colour), but mostly american "color", or "behavior" is used. Please check for consistency [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	Some confidence levels are not in italics [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	Please be consistent for units you provide for something per year, as for example "/yr", or "yr (superscript -1)" [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	Please check if superscript or normal for 21th, 20th etc., as this is not consistent yet. [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	Check if "comma" or "semicolon" is needed between the references, there are few mistakes in the use of , or ; [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	For layout consistency, the authors should decide if the scales in graphs should have inner tickmarks or outer tickmarks [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	It would be helpful if panels of all figures were named with a,b,c, and so on. This would avoid long and confusing captions as for example in Figure 1.1 in Topic 1 "Left column, top panel", "Left column, middle panel", "Left column, bottom panel" [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	Check section capitalization of headings and figure headings [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	Some graphs would be better to understand if a legend would be provided. However, due to page constraints and readability of (in many places very rich) composed figures, this may not always be possible. Please check the best compromise for readability, information and space constraints for the figures. [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	In some places, there are typos in the references to WGI, WGII, WGIII. For example, it reads WG1 instead of WGI, or WG11 instead of WGII. Moreover, "WG-I" and "WGI" , with or without a minus between the letters, is mixed. [Lena Menzel, Germany]	editorial, accepted
SPM	0	0	0	0	The report has lots of important messages but is not easy-to-understand for non-expert users. [Government of Vietnam]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0	0			Uncertainty Assessment: The presentation of assessed uncertainties (as agreement/evidence, confidence, likelihood) needs to be homogenized. It currently is confusing as it is largely inconsistent across paragraphs and sections in the SPM. For example, there are many paragraphs without explicit information about the assessed uncertainty of individual statements or even the entire paragraph (the latter in particular in Section 3/4). In other instances one particular sentence in a paragraph does have an uncertainty assigned, but the rest of the para does not. Updating the uncertainty information in line with the underlying WG reports is particularly relevant for paragraphs and statements where information from more than one WG is being combined. In those instances, the correct application of uncertainty terminology needs to be carefully reviewed and, if necessary, corrected. [Thomas Stocker/ WGI TSU, Switzerland]	accepted
SPM	0				Suggest that the authors should be cautious about elevating findings with low confidence to the SPM. There are at least four instances in the current draft. The authors should examine each of these and determine whether they add value and clarity to the SPM. [Government of Canada]	these are included if either it is connected to high confidence (e.g. Arctic and Antarctic), or when it is attached to very high risks
SPM	0				Many (bold) headline statements appear to come directly from the WG reports, and sometimes lack the clarity that needs to be provided by the context. We hope that the integration will be further improved in the next version. [Government of Belgium]	accepted
SPM	0				General comment: The document is a reasonable reiteration of the key findings from the underlying assessment from from the three working groups. However, the document needs to provide a more integrated assessment, to add value to the findings already presented. [Government of Ireland]	accepted
SPM	0				The document is too long. Much of the material presented is discussed in detail in the underlying WG reports. The document should concentrate on bringing the findings from WGs together. For example in Section 3 mitigation pathways could also integrate the findings related to Carbon Budget, rather than just atmospheric concentrations. [Government of Ireland]	synthesis has been better included. Unfortunately, due to many requests by experts and governments, the SPM is now even longer, to better represent the content of the topics.
SPM	0				In general the captions to figures are too technical and do not provide clarity as to the message which the authors wish to communicate to the policymakers. The technical foundation to the figures can be found in the underlying report and other volumes of the AR5. There is no need to duplicate these in the SPM. [Government of Ireland]	this is a balance between scientifically right, and proper communication indeed. We tried to get this balance right.
SPM	0				In general the captions to figures are too technical and do not provide clarity as to the message which the authors wish to communicate to the policymakers. The technical foundation to the figures can be found in the underlying report and other volumes of the AR5. There is no need to duplicate these in the SPM. [Government of Ireland]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				<p>From my perspective, as Physicist and journalist, those affirmations that are of total consensus should be highlighted. Those are: VIRTUALLY CERTAIN & EXTREMELY LIKELY</p> <p>SYR, should include in bold and inside of a box, all the relevant words that are linked to this consensus. This will give a series of “headlines” for politics and decision makers, but also for journalist and through the media, the general public.</p> <p>[Tomas Molina, Spain]</p>	we will use headlines, but differently
SPM	0				<p>I have filtered the document with these criteria and have found 13 references for Virtually certain, and 5 for Extremely likely [Tomas Molina, Spain]</p>	noted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>VIRTUALLY CERTAIN</p> <p>1.- Pag 6-8 It is virtually certain that the upper ocean (0–700 m) warmed from 1971 to 2010</p> <p>2.- Pag 11-39 It is virtually certain that there will be more frequent hot and fewer cold temperature extremes over most land areas on daily and seasonal time-scales, as the global mean temperature increases.</p> <p>3.- Pag 12-6 It is virtually certain that near-surface permafrost extent at high northern latitudes will be reduced as global mean surface temperature increases. {2.4.3}</p> <p>4.- Pag 14 -23 Global mean sea level rise will continue for many centuries beyond 2100 (virtually certain). {2.6}</p> <p>5.- Pag14- 25 An effectively irreversible reduction in permafrost extent is virtually certain with continued rising global temperatures.</p> <p>7.- Pag 32 -21 Based upon multiple independent analyses of measurements from radiosondes and satellite sensors it is virtually certain that globally the troposphere has warmed and the lower stratosphere has cooled since the mid-20th Century.</p> <p>7.- Pag 32 – 35 It is virtually certain that the upper ocean (0–700 m) warmed from 1971 to 2010,</p> <p>8.- Pag 36 -10 It is virtually certain that the ocean is taking up anthropogenic carbon dioxide from the atmosphere since pre-industrial times. This estimate is 570 ± 110 GtCO₂ from 1750 to 2011. {WG1 3.8.1, 6.3} Vegetation biomass and soils stored 585 ± 330 GtCO₂ over the 1750-2011 period. {WG1 6.3}</p> <p>9.- Pag 45 -47 it is virtually certain that tropical cyclone intensity has increased in the North Atlantic since 1970. {WG1: SPM, 2.6.3, 10.6}</p> <p>10.- Pag 55 -13 It is virtually certain that there will be more frequent hot and fewer cold temperature extremes over most land areas on daily and seasonal timescales, as global mean temperatures increases.</p> <p>11.- Pag 57 -24 It is virtually certain that near-surface permafrost extent at high northern latitudes will be reduced as global mean surface temperature increases.</p> <p>12.- Pag 70 -26</p>	noted
-----	---	--	--	--	-------

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>EXTREMELY LIKELY</p> <p>1.- Pag 9 -20 It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.{1.4}</p> <p>2.- pag 10 -9 It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together (Figure SPM.4).</p> <p>3.- Pag 39 -11 Human influence has been detected and attributed in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, and in global mean sea level rise; and has been extremely likely been the dominant cause of the observed warming since the mid-20th century.</p> <p>4.- Pag 40 -6 It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century. {WG1 SPM, 10.9, Table 10.1}</p> <p>5.- Pag 40 -20 It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together.</p> <p>[Tomas Molina, Spain]</p>	noted
SPM	0			<p>CONCLUSIONS:</p> <p>From this, Extremely likely could be reduced to one single bold/boxed that is already on the text at page 39, line 11 (thought I find the wording a little confusing in this version)</p> <p>For Virtually Certain 1 and 7 are the same 3, 5, 11, 13 are the same 4 and 12 are the same</p> <p>That reduces to 8 ITEMS of text to be bold/boxed with these criteria.</p> <p>The sum OF THIS TWO CRITERIA would be 9 bold/boxed items in the SYR</p> <p>[Tomas Molina, Spain]</p>	noted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				For all temperature changes, please use the same reference time period whenever possible. It would be more policy relevant to use a time period that can be regarded as an approximation to the pre-industrial, such as 1850-1900. For temperature increases with confidence levels, it can be mentioned that uncertainty levels do not include the uncertainty of the temperature increase between 1850 and 1986-2005. [Government of Belgium]	accepted where possible
-----	---	--	--	--	---	-------------------------

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>A.- 1.- Pag 6-8 It is virtually certain that the upper ocean (0–700 m) warmed from 1971 to 2010</p> <p>7.- Pag 32 – 35 It is virtually certain that the upper ocean (0–700 m) warmed from 1971 to 2010,</p> <p>B.- 2.- Pag 11-39 It is virtually certain that there will be more frequent hot and fewer cold temperature extremes over most land areas on daily and seasonal time-scales, as the global mean temperature increases.</p> <p>C.- 3.- Pag 12-6 It is virtually certain that near-surface permafrost extent at high northern latitudes will be reduced as global mean surface temperature increases. {2.4.3}</p> <p>5.- Pag 14- 25 An effectively irreversible reduction in permafrost extent is virtually certain with continued rising global temperatures.</p> <p>11.- Pag 57 -24 It is virtually certain that near-surface permafrost extent at high northern latitudes will be reduced as global mean surface temperature increases.</p> <p>13.- Pag 72 -8 An effectively irreversible reduction in permafrost extent is virtually certain with continued rising global temperatures.</p> <p>D.- 4.- Pag 14 -23 Global mean sea level rise will continue for many centuries beyond 2100 (virtually certain). {2.6}</p> <p>12.- Pag 70 -26 Global mean sea level rise will continue for many centuries beyond 2100 (virtually certain). {WGI 6.4.9, 26 12.5.2, 13.5.2}</p> <p>E.- 7.- Pag 32 -21 Based upon multiple independent analyses of measurements from radiosondes and satellite sensors it is virtually certain that globally the troposphere has warmed and the lower stratosphere has cooled since the mid-20th Century.</p> <p>F.- 8.- Pag 36 -10</p>	noted
SPM	0			<p>Even so SYR includes a summary for policy makers its still rather voluminous and time-consuming to read. We suggest a max 2 pages "Main finding list" for all 4 topics. Its anyhow better that such "simplifications" are done by the authors than by others. [Government of Sweden]</p>	we will use headline statements to do so

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				Health is mentioned very briefly. It should be included something about the severe effects as climate change may have on infectious diseases. Especially those who are spread by arthropod vectors and by water. Zoonotic diseases as are transferred between humans and animals are of special interest here and this is not mentioned at all in the SYR. Big global human killers as Rift Valley fever and Leishmaniasis are presently changing their geographical distribution and should be included as examples. 11.5.1.4 could be referred to since here are mentioned zoonoses as Hemorrhagic fever and Rift Valley fever. [Government of Sweden]	The SPM presents broad conclusions about the effects of climate change on human health. Many more details can be found in the underlying Working Group II report.
SPM	0				Agriculture also includes animal production as a significant part of it. This is not mentioned at all, in SYR just plant production is notified, but animal production should also be focused on. The impact on food security of lowered animal production in certain areas or due to ill-health of animals is obvious but also a serious effect on livelihood for many small-holders in the developing world may be seen. In addition animal production is central both for mitigation and adaptation. [Government of Sweden]	The SYR presents key findings about food security and food production systems, as well as on impacts on livelihoods, based on the underlying Working Group II report, where more details can be found.
SPM	0				The SPM is written in such dense language that it is very difficult to read, especially in paragraphs that also present numbers. It may be a better choice to exclude some information in order to actually get the most important messages across, especially when the information is easily available in the longer document. As it reads now it does not appear to be aimed at the uninitiated audience (which are presumably the most important to reach) [Government of Sweden]	accepted
SPM	0				The SPM uses terminology from the glossary on pages 29-30 without any definition. Considering that the SPM will be read as a stand-alone text, it should include some basics from this glossary in a box. [Government of Sweden]	rejected: SPM and Glossary are connected

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				Is it possible to say something about what happens after 2100. For example, temperature will continue to increase, sea level will continue to increase. [Government of Sweden]	taken into account. We now include a separate subsection in the SPM, Section 2.4 on "Climate Change beyond 2100, irreversibility and abrupt changes". The new headline statement for that subsection draws the attention to the long-term committed climate change and resulting impacts: "Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases cease. The risk of abrupt and irreversible change increases as the magnitude of the warming increases. {2.4}. The basis for the material in the SYR SPM is provided in Topic 2, Section 2.4, incl. Figures 2.1a and Figure 2.8 presenting projections beyond 2100.
SPM	0				In general I believe there is a need to be more precise and coherent with regards to terminology. A few examples: What is meant by "most economic sectors" (line 1, page 14). What is meant by "key economic sectors" (line 40, page 26)? How are the two terms related? How is "natural system" (line 20, page 13) related to "natural ecosystems" (line 49, page 25) and "ecosystems" (line 24, page 10)? How is "people" (l23, p10) related to "human systems" (l20, p13)? What is "extreme weather" (l13, p7) in relation to "climate events" (same line and page) and "climate extremes"? Reasons for concern is mentioned on page 13 without explanation and again on 22, then with the figure. Explain RfC the first time it appears in the text. Not everyone know what AFOLU (l35, p24) is. Climate-resilient pathway need to be explained. [Government of Sweden]	accepted, has been improved where necessary
SPM	0				Perhaps it is better to divide section 2 of the SPM in two sections, more in line with WG1 (future climate change) and WGII (risks and impacts)? [Government of Sweden]	more sub-sections have been included
SPM	0				The SPM uses the terminology from the Guidance of Uncertainty (Mastrandrea et al.) and these need to be explained in the SPM. [Government of Sweden]	footnote in intro SPM
SPM	0				The two special reports should be mentioned in note (l7, p5) [Government of Sweden]	Only the original reference for SPM was used
SPM	0				Note 1, page 5: Most policy makers understand what "90% uncertainty interval "mean. [Government of Sweden]	noted
SPM	0				The SPM needs to be more clear about the difference between "pre-industrial levels" and "1986-2005", eg. Fig. SPM.6. [Government of Sweden]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				A very important message is given in WGII, ch. 19.4: "Climate change impacts can have consequences beyond the regions in which they occur." Although this chapter does not go into detail about those impacts I think this is insight is highly policy-relevant and should/could be included in the SYR SPM. [Government of Sweden]	This theme is implicit in findings presented in the SYR SPM, including those on food security, water resources, displacement, and conflict.
SPM	0				I think figure SPM.1 from WGII clearly explains the relation between some key concepts. This could perhaps be included in the SYR SPM as well. [Government of Sweden]	considered to be included in the introduction
SPM	0				Unlike AR4, this version of AR5 is unclear about what are known and unknown in terms of observation and impact assessment. Information on what's still unknown is actually very important for policy-makers as they need to think about the direction of research, future work of IPCC and international research frameworks. It would be very useful to make relevant parts well-balanced by adding descriptions like the ones in AR4 SPM as following: (Examples in AR4"1.Observed Changes") "It is difficult to ascertain longer-term trends in cyclone activity, particularly in 1970.[1.1]"(p.2) "However, there is a notable lack of geographic balance in data and literature on observed changes, with marked scarcity in developing countries (1.2, 1.3)"(p.3) "Difficulties remain in simulating and attributing observed temperature changes at smaller than continental scales. (2.4)"(p.5) [Government of Japan]	reject. We can only use material that is in the AR5 reports
SPM	0				We suggest to delete all the headline statement since they are often a subjective selection of the following section, the bolded statement already give a good summary [Government of Netherlands]	reject, we will follow WG I example

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			Several aspects related to migration of species are mentioned in the Fifth Assessment Report. Migration caused by climate change is a major factor that will result in substantial and serious structural changes in ecosystems all over the globe. In order to facilitate an increase in knowledge of ecosystem effects, Norway wants to highlight the effort of quantifying the number of migrating species and changes in biodiversity in a certain geographic region. Species observations should be taken into account in terms of harvested and non-exploited populations. A number of benthic species have already expanded their range northwards. Please consider to include appropriate text from the WG reports about this issue in the SPM. As a concrete example we mention that more than 1600 benthic marine species were previously considered as southern living species for Norway, as they had their northern limit at the Norwegian coastline. 565 species have moved further north during the period 1997-2010, and they migrated 750 – 1000 km. 300 of these species can now be found far north as Svalbard and the western part of the Barents Sea. Over 100 new species have arrived from more temperate sea areas and established in Norwegian waters since 1997 until today. About 70 percent of new established species have arrived through the west coast of Scotland and Shetland. The remaining 30 percent have migrated from Swedish and Danish waters. [Government of Norway]	reject. Too much detail at the level of SYR SPM; no space for this
SPM	0			Please consider starting all paragraphs with a bold statement throughout the SPM. This will secure readability and coherence between paragraphs. [Government of Norway]	accepted, where appropriate
SPM	0			Terms of confidence level and likelihood should be explained in footnote [Toshihiko Takemura, Japan]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>The Working Group I and III reports of AR5 provide evidence and statements at several points that lead to the important conclusion that global net greenhouse gas emissions have to be near zero, zero, or negative within the twenty-first century to have a reasonable chance of staying below a two degree temperature limit (relative to pre-industrial). (See below). Although this is the most important message to convey to policymakers, it is now buried as the last sentence of a paragraph on the second-to-last page of the SYR. [page SYR-119, Line 19-20: “ ... and emission levels near zero GtCO₂eq or below in 2100.”]. Furthermore, staying below 1.5 degree (footnote page 19, IPCC SPM WG III), requires definitely net negative emissions some time after 2050 when looking at the carbon budget of 655 - 815 Gt CO₂ (2011-2050) and 90 - 350 Gt CO₂ (2011 - 2100) and CO₂ emissions need to be 70 - 95% below 2010 by 2050 and 110% - 120% below 2010 by 2100.</p> <p>Therefore, I recommend adding a statement to the SPM of the Synthesis Report at around Page SYR-16, Line 16 along the lines of :</p> <p>“The mitigation literature leads to the robust conclusion that global net greenhouse gas emissions have to be negative, zero, or near zero by the end of the twenty-first century to have a likely chance of staying below a two degree temperature increase relative to pre-industrial conditions. (high certainty). To stay below 1.5 degree temperature increase compared to pre-industrial levels by about 2100 requires net-negative GHG emissions some time after 2050 and definitely by the end of the century (high certainty).”</p> <p>The statement on zero GHG emissions is further supported by evidence and statements in the following locations of the WG I and III reports:</p> <p>WG III, SPM – p. 11, Figure SPM.4 WG III, SPM – p. 12, Table SPM.1 WG III, SPM – p. 13: “Scenarios reaching atmospheric concentration levels of about 450 ppm CO₂eq by 2100 (consistent with a likely chance to keep temperature change below 2 °C relative to pre-industrial levels) include substantial cuts in anthropogenic GHG emissions by mid-century through large-scale changes in energy systems and potentially land use (high confidence). Scenarios reaching these concentrations by 2100 are characterized by lower global GHG emissions in 2050 than in 2010, 40 % to 70 % lower globally , and emissions levels near zero GtCO₂eq or below in 2100.”</p> <p>WG I, Technical Summary, p. T-57: “It is about as likely as not that sustained</p>	<p>The following statement has been included in the SPM, under section 3.2 :Mitigation limiting warming below about 2°C or even 3°C requires that global net emissions decrease to near zero in the long-run, before or after 2100 depending on the temperature target. The level of warming is largely determined by cumulative emissions of CO₂ which in turn, are linked to emissions reductions over the next several decades and beyond (Figure SPM.10.B). Substantial cuts in greenhouse gas emissions over the next few decades can substantially reduce risks of climate change in the second half of the 21st century (Figure SPM.10.C) (high confidence). {2.2.5, 3.2, 3.4, Article 2 Box}</p>
SPM	0			<p>There is almost no description on ethical consideration for mitigation and adaptation in the SPM of SYR. However, in SPM of WGIII, sustainable development and equity is a very important component. It's better to leave some space for euqity, justice and firness arise with repect to mitigation and daaptation. [Songli Zhu, China]</p>	<p>The SPM now has a section 3.1 on Foundations of decision making for climate change that discusses the ethical and equity dimensions.</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				Suggest that the SYR SPM in particular, but also the SYR itself, avoid to the greatest extent possible, differentiating between practices, classifications, assessment methods, etc., that are adopted in the different working groups. The point is to synthesize, and therefore to erase these boundaries to the extent possible in summarizing the key take-away messages for policy makers. Saying that WGIII did something in a particular way, and therefore implicitly saying that another WG might have done this differently, undermines messages by introducing an additional potential source of doubt in the minds of readers. [Government of Canada]	accepted where possible
SPM	0				A version of WGII Figure SPM.1, modified to better capture WGI and III issues, would be a useful addition and would likely be most effectively placed at either the beginning of the SPM. The figure provides a useful framework for the Synthesis and is, to our knowledge, the only figure in the report that draws together the broader contributions of all the working groups. [Government of Canada]	Has been considered, but rejected since this figure only represents a WG II view on risks, while SYR should represent all three WGs
SPM	0				The presentation of uncertainty information requires editorial attention. For example, calibrated uncertainty terms are not always set in italics, and several different notations seem to be used for reporting uncertainty ranges, which creates confusion about whether the different types of notations consistently have the same interpretation as 90% uncertainty intervals. Footnote 1 of the SYR SPM introduces a convention - but it is not used consistently. [Government of Canada]	editorial, accepted
SPM	0				Figures : The units system is not consistent across SPM figures, both /yr and yr ⁻¹ appear, it should be yr ⁻¹ to stick to IPCC AR5 WG guideline for units. And units should always be written between parenthesis [Thomas Stocker/ WGI TSU, Switzerland]	editorial, accepted
SPM	0				The explanation of abbreviations is not consistent throughout the SPM. Some times abbreviations are explained some times not. This needs to be harmonized. [Thomas Stocker/ WGI TSU, Switzerland]	editorial, accepted
SPM	0				Captures adequately contents of the underlying reports [Government of Kenya]	thank you and noted
SPM	0				The report provides a lot of pertinent information. But for policy makers it needs to be simpler to follow and more relevant. Currently the overall report lacks clarity, is too detailed at times and disjointed in connecting the findings of WG1, 2 and 3 in a way that is relevant for policy makers. The report needs to synthesize information in a manner that conveys the essence of 3 reports. In respect of mitigation, the findings of WG 1 are that we have only a limited time and a very small carbon budget left (1 trillion tonnes). To remain within the budget, the policy relevant conclusion is that emissions of GHG must be fully phased out if temperatures are to remain below 2 deg C temperature. [Farhana Yamin, United Kingdom]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				The report should integrate findings of WG 1 and WG3 on the timescale of the phase out of emissions into one clear infographic. This infographic does not currently exist and should be created for the synthesis report. The new graphic and text would make clear that only RCP2.6 has more than a higher than likely chance of maintaining temperatures below 2 degC. The synthesis should state clearly that the vast majority of mitigation scenarios that keep temperatures below 2 deg C with >66% certainty do so on the basis of modelling that are based on a phase out of GHG gases by 2100 to net zero or net negative levels. This conclusion is important for policy making but is "lost" from view. [Farhana Yamin, United Kingdom]	The SPM includes a table that presents this information: Table SPM.1: Key characteristics of the scenarios collected and assessed for WGIII AR5. For all parameters, the 10th to 90th percentile of the scenarios is shown1,2. {Table 3.1}
SPM	0				Following on from the above conclusion reached by WG 1 and 3 that emissions must be net zero, the text and graphics should show the relationship between different gases/sources implicated in the phase out to zero. For example, CO2 from fossil fuels, CO2 from land use and non-CO2 gases. Policy makers will be interested in knowing whether emissions from fossil fuels can be compensated for emissions from land use and/or non-CO2 gases. Again, the findings of WG 3 are that a full phase out of all gases is needed with energy related emissions having to be zero and land use emissions being net zero. Yet this key finding does not emerge clearly in the synthesis. Specifically, SPM page 8 line 11 After ""The largest single driver of current climate change is the cumulative increase of anthropogenic CO2 emissions."" add ""Increased use of coal relative to other energy sources has reversed the longstanding trend of gradual decarbonization of the world's energy supply."" This statement from WG3 SPM is the most relevant statement directly helping policy makers to explain recent changes in the CO2 emissions trends and is of direct relevance to policy makers. [Farhana Yamin, United Kingdom]	Taken into account. The sentence proposed by the reviewer has now been included in SPM Section 1.2 Causes of Climate Change
SPM	0				Range between brackets (es. 0.78 [0.72 to 0.85]) make the report difficult to read, suggest removing the figures in brackets [Government of Italy]	rejected, these are policy relevant

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				<p>One of the main advances in the WG1 AR5 report compared to AR4 was the carbon budget. Similarly, the WG3 report pays a lot of attention to the "decarbonisation" which is the logical twin brother of finite carbon budgets. This link and information has to be brought out more prominently in the SYR report. As a general text, the authors might lean on the WG3 TS text:</p> <p>"The stabilization of greenhouse gas concentrations at low levels requires a fundamental transformation of the energy supply system, including the long-term phase-out of unabated fossil fuel conversion technologies and their substitution by low-GHG alternatives (robust evidence, high agreement). Concentrations of CO2 in the atmosphere can only be stabilized if global (net) CO2 emissions peak and decline toward zero in the long term. Improving the energy efficiencies of fossil power plants and/or the shift from coal to gas will not by itself be sufficient to achieve this. Low GHG energy supply technologies are found to be necessary if this goal is to be achieved. (Figure TS.19). [Government of Germany]</p>	<p>This is covered in section 4.3 on Response options for mitigation: "Mitigation options exist in every major sector. Cost-effective mitigation is based on an integrated approach that combines measures to reduce energy use and the GHG intensity of end-use sectors, decarbonize energy supply, and reduce net emissions and enhance carbon sinks in land-based sectors."</p>
SPM	0				<p>A crucial role for the Synthesis report is the integration of the most policy relevant information - ideally in easily accessible figures. In this respect, a figure that connects the implied near-complete decarbonisation of the electricity sector (see e.g. WG3 Fig. TS.17 or top of WG3 Fig. TS.19) and deep reductions in other sectors with the likely global-mean temperatures and impacts is missing. The closest is current Fig. SPM.9 and this figure could be adapted in that regard. Alternatively, another second standalone figure that examines the different pieces of information on near-complete (90%) economy-wide decarbonisation years or sectoral decarbonisation points (electricity sector) would be vital. Please provide that information succinctly for the mitigation categories that are relevant for the targets discussed under UNFCCC process. [Government of Germany]</p>	<p>Accepted. A simplified version of WG3 Figures TS.15 and TS.17 has been added as new Figure SPM.14.</p>
SPM	0				<p>Please provide information on global as well as regional and sectoral emission reductions related to different levels of warming and for different years. Specifically, include information on the year of peaking emissions, 2030, 2050, 2070, and 2100 and the year, where key sectors are substantially decarbonized (90%) for different mitigation scenario categories. Distinguish between physical emissions in different regions (WG3 Table. 6.4) and effort sharing allocations (WG3, Fig. 6.28, 6.29) Where appropriate, compare AR4 and AR5 results. [Government of Germany]</p>	<p>Too detailed for SYR SPM</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				<p>The Working Group I and III Reports of AR5 provide evidence and statements at several points that lead to the important conclusion that global net greenhouse gas emissions have to be near zero, zero, or negative within the twenty-first century to have a reasonable chance of staying below a two degree temperature limit (relative to pre-industrial). (See below). Although this is a very important message to convey to policymakers, it is now buried as the last sentence of a paragraph on the second-to-last page of the SYR. [page SYR-119, Line 19-20: “ ... and emission levels near zero GtCO₂eq or below in 2100.”]</p> <p>Therefore, I recommend adding a statement to the SPM of the Synthesis Report at around Page SYR-16, Line 16 along the lines of</p> <p>“The mitigation literature leads to the robust conclusion that global net greenhouse gas emissions have to be negative, zero, or near zero by the end of the twenty-first century to have a likely chance of staying below a two degree temperature increase relative to pre-industrial conditions. (high certainty).” [Joseph Alcamo, Germany]</p>	zero emissions are already mentioned in SPM
SPM	0				<p>This statement on zero GHG emissions is supported by evidence and statements at the following locations of the WG I and III reports: [Joseph Alcamo, Germany]</p>	zero emissions are already mentioned in SPM
SPM	0				WG III, SPM – p. 11, Figure SPM.4 [Joseph Alcamo, Germany]	zero emissions are already mentioned in SPM
SPM	0				WG III, SPM – p. 12, Table SPM.1 [Joseph Alcamo, Germany]	zero emissions are already mentioned in SPM
SPM	0				WG III, SPM – p. 13: [Joseph Alcamo, Germany]	zero emissions are already mentioned in SPM
SPM	0				<p>“Scenarios reaching atmospheric concentration levels of about 450 ppm CO₂eq by 2100 (consistent with a likely chance to keep temperature change below 2 °C relative to pre-industrial levels) include substantial cuts in anthropogenic GHG emissions by mid-century through large-scale changes in energy systems and potentially land use (high confidence). Scenarios reaching these concentrations by 2100 are characterized by lower global GHG emissions in 2050 than in 2010, 40 % to 70 % lower globally¹⁶, and emissions levels near zero GtCO₂eq or below in 2100.” [Bold added] [Joseph Alcamo, Germany]</p>	Taken into account. We highlight the transformations required in energy systems and land-use in the revised version.
SPM	0				WG I, Technical Summary, p. T-57: [Joseph Alcamo, Germany]	noted
SPM	0				<p>“It is about as likely as not that sustained globally negative emissions will be required to achieve the reductions in atmospheric CO₂ in RCP2.6.” [Joseph Alcamo, Germany]</p>	noted
SPM	0				WG I, Chapter 12, p.1114, Fig. 12.46 [Joseph Alcamo, Germany]	noted
SPM	0				WG I, Chapter 6, p. 468: [Joseph Alcamo, Germany]	noted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				"For RCP2.6, an average 50% (range 14 to 96%) emission reduction is required by 2050 relative to 1990 levels. By the end of the 21st century, about half of the models infer emissions slightly above zero, while the other half infer a net removal of CO2 from the atmosphere." [Joseph Alcamo, Germany]	noted
SPM	0				WGI, Chapter6, p. 524-526: "The IMAGE IAM predicts that global negative emissions are required to achieve the RCP2.6 decline in radiative forcing from 3 W m ⁻² to 2.6 W m ⁻² by 2100. All models agree that strong emissions reductions are required to achieve this after about 2020 (Jones et al., 2013). An average emission reduction of 50% (range 14 to 96%) is required by 2050 relative to 1990 levels. There is disagreement between those ESMs that performed this simulation over the necessity for global emissions in the RCP2.6 to become negative by the end of the 21st century to achieve this, with six ESMs simulating negative compatible emissions and four ESM models simulating positive emissions from 2080 to 2100." [Joseph Alcamo, Germany]	noted
SPM	0				It is suggested to include a table or a text box summarizing new findings, progresses and improvements in AR5 in relation to AR4 [Government of Spain]	Changes compared to AR4 will be presented in outreach events
SPM	0				My comments focus on the SPM, as that is where 90% of readers will focus. Most readers will treat the rest of the Synthesis Report as a 'Technical Summary', to which experts can refer for the supporting detail especially as it is ~100 pages long. Therefore many of the Figures in the SPM need to be simplified (less detail-laden) from those in the main text to make their main messages stand out more clearly for that readership (a surprisingly proportion of whom have difficulty understanding charts with more than two lines!). [Tony Weir, Australia]	accepted
SPM	0				The Box on 'Information relevant to Article 2 of UNFCCC' is so important for many 'policy makers' that at least some of its main points should feature in the SPM. [Tony Weir, Australia]	accepted, we will include material of Art2 box in SPM
SPM	0				I commend the practice of highlighting the key points of the SPM by the shaded boxes at the head of each section, and some bold face sentences in the text. However some of these 'highlights' are phrased so blandly as to be almost useless and a few key points have been passed over. (see my more detailed comments.) [Tony Weir, Australia]	accepted
SPM	0				I commend the practice of highlighting the key points of the SPM by the shaded boxes at the head of each section, and some bold face sentences in the text. However some of these 'highlights' are phrased so blandly as to be almost useless and a few key points have been passed over. (see my more detailed comments.) [Tony Weir, Australia]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				The fate of billions today and in the future, and almost all life, depends on this SYR SPM assessment. Taken together, this SYR SPM as it stands proves for certain that we are all in a state of committed global climate change planetary emergency due to extreme unavoidable impacts and risks of many catastrophic impacts to huge present populations, all future generations, and the life-sustaining biosphere of the planet. I focus on the SPM because this is the report that determines policy and is the science basis for international negotiations. The SYR SPM proves that the only response to consider is the AR5 RCP2.6 emissions mitigation scenario applied as a global emergency, which requires CO2 and CO2 eq. emissions to decline rapidly from 2020 at the latest, provided that all forms of biomass and fossil fuel combustion are replaced by true clean energy sources that do not involve any burning. The Burning Age is over. [Peter Carter, Canada]	noted
SPM	0				1. MAJOR ERROR: The SYR has not stated that the world is beyond or at DAI. CORRECTION: State that by the weight of evidence, the world is in a state of dangerous anthropogenic interference with the climate system. (**See rationale in Appendix.) [Peter Carter, Canada]	reject, SPM is based on accepted WG results
SPM	0				2. MAIN ERROR: 2°C is the focus of assessment and calculations, even though 2°C, according to the SYR SPM evidence, leads to multiple catastrophic impacts with enormous risks of planetary catastrophes that threaten the survival of most life. CORRECTION: 1.5°C (and not just 2°C) must be the focus of assessment and calculations. According to RCP2.6, 1.5°C is feasible. State that 1.5°C is feasible provided RCP2.6 is acted on rapidly with emissions declining by 2020. [Peter Carter, Canada]	issues are already sufficiently addressed;
SPM	0				3. MAIN ERROR: Only a 3°C climate sensitivity is used for calculations. The choice of 3°C is as much a value judgement as it is an expert judgement. Taking the single mean is a highly risk-tolerant choice and therefore a bad value judgement. CORRECTION: Include a 4.5°C climate sensitivity for calculations, not just the single 3°C. RATIONALE: "... setting policy on the basis of a 'best estimate' climate sensitivity accepts a significant risk of exceeding the temperature thresholds." "Linking emission scenarios to changes in global mean temperature, impacts and key vulnerabilities since the climate sensitivity could be higher than the best estimate" (AR4, WG III, TS, 3.5.2). "Non-linearities in the feedbacks (including e.g. ice cover and carbon cycle) may cause time dependence of the effective climate sensitivity, as well as leading to larger uncertainties for greater warming levels" (AR4 WG I, 10.7.2). [Peter Carter, Canada]	Reject. The SYR and the underlying WG reports do assess sensitivities of climate projections to a range of climate sensitivities. See e.g., SYR Table. SPM.1, SYR Section 3.2. Temperature projections do account for uncertainty from both carbon cycle and climate system uncertainties.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				4. ERROR: The SYR SPM does not include the best available combination of technology for mitigation (and for healthy lifestyle change). CORRECTION: The SYR SPM must include the best available combination of technology for mitigation. It must state that clean, true, zero/lowest carbon energy sources are more than enough to replace the global need for energy from biomass and fossil fuel burning (SRENN 2011). [Peter Carter, Canada]	rejected, policy mix is up to policy makers
SPM	0				5. ERROR: The SYR SPM does not include the highest published figure on fossil fuel subsidies. CORRECTION: Include the highest published figure on fossil fuel subsidies (International Monetary Fund: \$1.9 trillion globally per year). [Peter Carter, Canada]	rejected, due to space restrictions
SPM	0				6. ERROR: The SYR SPM does not include the mean or highest published figure on externalized socio-environmental costs of the fossil fuel use. CORRECTION: Include the highest published externalized socio-environmental costs of fossil fuel pollution and GHG pollution (TRUCOST). [Peter Carter, Canada]	rejected, due to space restrictions
SPM	0				7. ERROR: The SYR SPM does not include the extra warming from all amplifying carbon feedback emissions in global warming projections. CORRECTION: Include extra warming of all amplifying carbon feedback emissions in global warming projections, which can be added to RCP projections. And/or the AR4 A2 extra terrestrial carbon feedback warming of >1°C by 2100 can be used. [Peter Carter, Canada]	rejected, due to space restrictions
SPM	0				8. ERROR: The SYR SPM does not include the extra warming from all amplifying carbon feedback emissions in the cumulative carbon budget. CORRECTION: Include extra warming of all amplifying carbon feedback emissions in the cumulative carbon budget. [Peter Carter, Canada]	rejected, due to space restrictions
SPM	0				9. ERROR: Ocean acidification is not included in the cumulative carbon budget. CORRECTION: Include ocean acidification in the cumulative carbon budget. [Peter Carter, Canada]	Reject. The models used here do account for the uptake of CO2 by the oceans and changes to ocean carbon chemistry, and thus ocean acidification.
SPM	0				10. ERROR: The SYR SPM finds that Arctic sea ice decline is not irreversible. CORRECTION: Correct the finding that Arctic sea ice decline is not irreversible and is not committed to virtually disappearing in the summer. Without geoengineering, the Arctic is committed to becoming virtually ice-free in the summer, and this situation is irreversible. [Peter Carter, Canada]	issues are already sufficiently addressed;

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				11. ERROR: The SYR SPM does not include Arctic amplification. CORRECTION: Include Arctic amplification as an amplifying feedback, regionally in the Arctic, in the Northern Hemisphere, and potentially globally. [Peter Carter, Canada]	Reject. While not specifically mentioned in the SYR SPM, Arctic amplification is in fact specifically highlighted in SYR Topic 2, Section 2.2.1 (previously 2.4.1) "The Arctic region will continue to warm more rapidly than the global mean. Warming globally will be larger over the land than over the ocean (<i>very high confidence</i>) (Figure 2.2)." In addition, Figures SPM.7, SYR 1.1, 1.10, and 2.2 all visually support the regionally differing warming, including in the Arctic, over the globe over the recent past and projected for the future under different scenarios.
SPM	0				12. ERROR: The SYR does not include the "vicious cycle" of Arctic amplifying feedbacks. CORRECTION: Include in SYR SPM the enormous risk of the "vicious cycle" of multiple, combined self-reinforcing Arctic amplifying feedbacks. [Peter Carter, Canada]	rejected, due to space restrictions
SPM	0				13. ERROR: The SYR does not include the enormous risk of warming acting to destabilize methane hydrates, particularly the most vulnerable methane hydrate in the Arctic. CORRECTION: Include in SYR SPM the enormous risk that warming could destabilize methane hydrates, particularly the most vulnerable methane hydrate in the Arctic. [Peter Carter, Canada]	Noted. Information in the SYR needs to be fully based on the underlying WG reports. The scientific evidence base for the assessment of methane clathrates presented in WGI AR5 is very limited and associated with very large uncertainties, and was thus not elevated to the SYR. More information can be found in the underlying WGI contribution to the AR5. For example, WGI AR5 Ch6 estimates the total geological stock of methane clathrates in shallow ocean sediments and on the slopes of continental shelves, and permafrost soils as globally between 1500 and 7000 PgC, but assigns <i>low confidence</i> to this finding. WGI AR5 Ch12, dealing with long-term climate projections, assessed the possibility that methane from clathrates will undergo catastrophic release as <i>very unlikely (high confidence)</i> .
SPM	0				14. ERROR: The SYR SPM does not include committed global warming. CORRECTION: Include committed global warming. Due to the inertia of the ocean heat lag, amplifying carbon feedbacks, and other unavoidable sources of more warming, committed future warming is much higher than today's warming. [Peter Carter, Canada]	issues are already sufficiently addressed;

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				15. ERROR: The SYR SPM does not include assessment of impacts beyond 2100, even though impacts do not stop at 2100. CORRECTION: Include assessment of impacts up to 2300. The RCP warming projections are given up to 2400. [Peter Carter, Canada]	Taken into account. We now include a separate subsection in the SPM, Section 2.4 on "Climate Change beyond 2100, irreversibility and abrupt changes". The new headline statement for that subsection draws the attention to the long-term committed climate change and resulting impacts: "Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases cease. The risk of abrupt and irreversible change increases as the magnitude of the warming increases. {2.4}. The basis for the material in the SYR SPM is provided in Topic 2, Section 2.4, incl. Figures 2.1a and Figure 2.8 presenting projections beyond 2100.
SPM	0				16. ERROR: The warming at which crop decline begins is incorrectly given in the SYR SPM. CORRECTION: Correct the crop decline warming in the SYR SPM to 1°C regional or global from 1850. As stated incorrectly now, it is above 2°C global from 1850. [Peter Carter, Canada]	accepted
SPM	0				17. ERROR: An incorrect impression is given that adaptation can effectively roll back impacts. CORRECTION: State that adaptation is not likely to be effective without ongoing mitigation, and cannot then be assumed to be of longstanding benefit for living under climate change. [Peter Carter, Canada]	issues are already sufficiently addressed;
SPM	0				18. ERROR: Fossil fuels and biomass with CCS are classified as zero/lowest carbon energy sources. CORRECTION: State that research science says these are not actual zero-carbon sources of energy. [Peter Carter, Canada]	issues are already sufficiently addressed;
SPM	0				19. ERROR: Mitigation costs referred to are for using undesirable methods of mitigation or are derived from applying perverse economics. Costs such as exist are relatively trivial. CORRECTION: Delete all mention of "costs" of mitigation, as they are not policy-relevant. [Peter Carter, Canada]	rejected, these are policy relevant

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				20. ERROR: The cost-benefit methods used do not include the enormous increasing benefits (and co-benefits) of converting polluting sources of energy to clean energy. CORRECTION: As converting polluting sources of energy to clean energy will be a huge boost to the world economy and employment, use only cost-benefit methods that include the enormous increasing benefits (and co-benefits) of this conversion. [Peter Carter, Canada]	Taken into account. Note that presented results on mitigation scenarios are based on cost-effectiveness and not cost-benefit analysis. We clarify that cost estimates do not include the benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation. Co-benefits are addressed separately and the positive contributions of mitigation for health are now clearly acknowledged. In addition, the cost estimates do take into account the economic impacts of moving from more to less polluting sources of energy -- these are core to cost estimates provided for mitigation
SPM	0				The purpose of climate change assessment in terms of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) is to determine the level of atmospheric greenhouse gas concentrations that constitutes "dangerous anthropogenic interference with the climate system" (DAI). The clear intent and specific terms define what constitutes DAI, namely, safety with regard to sustainable food, sustainable economies, and sustainable natural ecosystems. Avoiding these dangers today requires governments, policy makers and the public to have assessments from the IPCC of the impacts -- and the risks of impacts -- of climate change. [Peter Carter, Canada]	noted
SPM	0				The AR5 SYR SPM makes no conclusions on the key issue of DAI. The IPCC makes conclusions throughout the assessment reports; indeed, the AR4 listed Key Conclusions. There is nothing in the IPCC mandate or terms of reference that says it cannot draw DAI conclusions, and it is the body best qualified to draw such conclusions. The SYR appears to claim that the IPCC does not make conclusions on DAI because that would be a "value judgement." The obvious fact is that determining DAI is an expert judgement (which the IPCC frequently makes on the science) and is not a value judgement (a personal opinion on right or wrong). The IPCC would not be making a value judgement on DAI because the UNFCCC clearly specifies those situations that constitute DAI. The IPCC is obligated to connect the dots of the science findings in the assessments and the science situations in the UNFCCC. [Peter Carter, Canada]	Box Art2 stays within its mandate

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				The IPCC SYR must decide if the AR5 WG I to III evidence shows that GHG levels put the world at or beyond DAI, or not. The evidence recorded from many lines is overwhelming that the world is beyond DAI and the IPCC is obliged to make this conclusion. If the IPCC is silent on this most vital of all aspects of global climate change, governments, policy makers and the public might assume that the world is not past DAI. An opportunity to prevent planetary catastrophe might be missed. [Peter Carter, Canada]	rejected, not within the IPCC mandate
SPM	0				The AR5 SYR does not give a safety/danger limit for atmospheric GHG concentrations. Clearly, this is the single most vital information and it must be the IPCC that provides it. [Peter Carter, Canada]	issues are already sufficiently addressed;
SPM	0				As the synthesis of the three WGs, the AR5 SYR SPM must make conclusions regarding dangerous climate interference in order that policy recommendations can be made to prevent interference and impacts that would be catastrophic (for huge human populations and the planet). Not to do so would be the grossest negligence of all time. [Peter Carter, Canada]	issues are already sufficiently addressed;
SPM	0				INCLUDE the US EPA Endangerment finding. It has already been established, in an Environmental Protection Agency "Endangerment Finding," that greenhouse gas emissions are dangerous to "the public health and welfare of current and future generations" (EPA 2009). The SYR SPM uses the term "threat" (e.g., p. 26, line 54-56: "Climate change poses an increasing threat to equitable and sustainable development. Some climate-related impacts on development are already being observed. Climate change is a threat multiplier, exacerbating other threats to social and natural systems"), which obligates the IPCC to state that we are beyond DAI. [Peter Carter, Canada]	we need to stick to WG material
SPM	0				Risk is quantified by the standard IPCC-approved cautionary formula of probability times magnitude of a consequence or impact. The term "risk" shows up on 65 pages of the SYR, most showing that we are presently at risk. These documented cases of current risk clearly prove, under the defined terms of the UNFCCC, that we are beyond dangerous interference with the climate system. The IPCC has no excuse for not making this crucial statement as a finding, based on the overwhelming amount – from many lines – of evidence in the SYR SPM. Otherwise, governments, who rely on the IPCC (only) for their climate change assessment, will assume we are not past DAI and therefore will be less likely to come to an international agreement to take imperative mitigation and adaptation action. [Peter Carter, Canada]	noted
SPM	0				An assessment of climate change is not a proper assessment without expert conclusions on dangerous atmospheric GHG levels. For no good reason -- and harmful to the most climate change vulnerable, natural ecosystems, and all future generations -- the IPCC does not make conclusions on DAI, nor on a climate safety limit, which is routine in environmental health assessment for governments. [Peter Carter, Canada]	noted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				The IPCC makes value judgements throughout the assessment. For example, as the assessment largely depends on models, the assessment is already largely value-judgement-based. (Hence there is no excuse for not making a value judgement, even though DAI would be an expert judgement, not a value judgement.) "Models, including those with socio-economic components, are not independent of the value judgements, world views, or preferences of the modeler" (SYR p. 52 line 2-3). "All metrics have shortcomings, and choices contain value judgments" (SYR p. 90, line 12). "The weight assigned to non-CO2 components relative to CO2 depends strongly on the choice of metric and time horizon" (SYR p. 90, line 19-20). Another example of value judgement made by IPCC is that the GWP for methane used is 25-28, which defers methane warming over 100 years; this choice is a value judgement. [Peter Carter, Canada]	noted
SPM	0				Some extremely bad crucial value judgements have been made in the AR5, such as the choice of single linear climate sensitivity (3°C) for all situations and the single catastrophically dangerous global warming target of 2°C, so the IPCC value judgement claim does not hold up. Stating that we are beyond DAI is not a value judgement (personal opinion on right or wrong) because DAI is clearly and specifically defined for the experts by the UNFCCC. It is a bad value judgement for experts to decide not to determine DAI when the future of civilization, humanity and almost all life are now at high risk. [Peter Carter, Canada]	rejected
SPM	0				Scientists routinely make value judgements for the good of society, with health, environmental health (e.g., toxicology), and engineering experts being obvious examples. The IPCC assessment is fundamentally flawed for policy relevance and decision making because it makes no conclusions from observations and projections regarding DAI with safety limits to atmospheric greenhouse gas and global warming levels, which can be easily done. It makes the assessment policy-confusing and unintentionally policy-misleading, because without a directed focus on climate safety, the assessment includes all kinds of content that contributes to DAI. [Peter Carter, Canada]	noted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				Whether the IPCC thinks DAI is a value judgement or an expert judgement, the IPCC must nevertheless make the judgement. Ethically, not making this judgement is totally unacceptable gross negligence because huge highly vulnerable populations have been recognized for many years in assessments, but AR5 mitigation, not being directed at climate safety, is not directed at protecting them. The most basic rights under the Universal Declaration of Human Rights of billions of people are being ignored and abused. The same applies to all future generations. This is perhaps the most extreme example of AR5's unintentional fossil fuel bias. To not at least explain this extraordinary IPCC policy of silence on what matters most for present and future world security is most dangerously misleading to all parties and I submit that this policy must be corrected by the SYR and must stop. [Peter Carter, Canada]	noted
SPM	0				The SPM seems to miss some information regarding the gender balance and equity. As this is a key aspect in sustainable development it needs to be addressed for the policy makers in the climate change context. [Government of Maldives]	The SPM now has a section 3.1 on Foundations of decision making for climate change that discusses the ethical and equity dimensions: Mitigation and adaptation raise issues of equity, justice, and fairness and have implications for sustainable development and poverty eradication. Many of those most vulnerable to climate change are among the least responsible for GHG emissions.
SPM	0				The definition of the term "climate change" is needed if conclusions on attribution are to be understood. Attribution of, for example, temperature increase to human influences covered in the WG I report is different than the attribution of an impact to a change in climate covered in WG II. Since the SYR includes both types of attribution conclusions, it is ambiguous what these conclusions mean. Some simple way of defining attribution conclusions where they are stated is needed. [Haroon Kheshgi, United States of America]	This has been clarified during the revision in numerous places. It must be stated however that there is no ambiguity in the term "climate change" itself, it is simple English and refers to changing climate, irrespective of any cause. The SYR makes now clear what is attributed to what - typically, impacts are attributed to changing climate, again irrespective of the cause of that change.
SPM	0				Expert Reviewer's were asked to make any recommendations that would shorten the Synthesis Report. [Harold David Tattershall, United States of America]	noted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>One consideration would be to completely remove the opening 29-page summary. This section may be considered by some as a summary, however by any standard it is extremely difficult reading, bearing little relationship to what most would consider a summary. There is no identifiable flow in the overall text as short paragraphs jump almost randomly from one subject matter to another. And, once a report reader has navigated this section the main body text of the report then repeats and marginally augments the items covered in the summary, again summarized from, and cross-referenced to, various sections of the overall AR5 assessment. The net effect is a disjointed summary, of a summary, as opposed to clarity. [Harold David Tattershall, United States of America]</p>	It's a Panel decision to have a SPM. However, points well take to improve SPM
SPM	0			<p>One stated change to the content of AR5, from AR4 and former assessments, was to present commentary, with supporting scientific evidence, relative to risk. The Synthesis Report recognizes that AR5 will be interpreted to policy by various 'actors' and 'agents' but fails to establish a framework that bridges the void between science and the various disciplines of the teams surrounding the final decision makers. This could lead directly to confusion and misinterpretation of the data contained in AR5 and should be remedied, given some of the potential outcomes portrayed within the overall document.</p> <p>One way in which this could be achieved is to replace the current proposed 29-page summary and open the document with framework of understanding; specifically tailored for non-scientific 'actors' and 'agents'. This would assist in bringing clarity, for those participants, to the actual risks associated with both the entire IPCC process and specific sections within the assessments that process produces. In the business world this would be considered essential for any document that was to be ultimately used to create a legally binding document.</p> <p>[Harold David Tattershall, United States of America]</p>	It's a Panel decision to have a SPM. However, points well take to improve SPM

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>Items that could be considered for the proposed 'framework of understanding' opening section are:</p> <p>1. In the event that the climate entered an irreversible mode, or a mode that could be considered as unstoppable towards an undesirable state, it is almost certain that the IPCC process would fail to identify and report on the situation for a minimum of a decade after it had initiated. The methodology incorporated in scientific assessments demands a rigorous review of peer reviewed evidence and a level of consensus at a minimum from the lead authors, of individual sections, and the overall assessment. Additionally, so-called 'cutting edge' data and information will rarely if ever be included in deliberations as it is constrained by the required methodology and will therefore take several years to progress through the process. In particular scientific standards require a baseline of data, in many instances 30 years, in order to conclusively establish the validity that apparent observable evidence is not merely natural variability within the overall climate system. Even in the event that the evidence was profound, and the baseline was reduced to 5 years, the inherent IPCC process, in tandem with timing between assessments, would result in a potential minimum delay of a decade prior to a quantified and published situation appraisal.</p> <p>The various 'actors' and 'agents' participating in the interpretation of AR5 to policy should be extremely cognizant of these limitations in the IPCC process. As matters stand the climate may already be in a non-linear mode, which would result in extreme difficulty of avoiding the 2 °C increase, deemed as the agreed upper limit to avoid potentially 'dangerous' impacts by all nations participating in UNFCCC negotiations.</p> <p>2. Many of the assessments within AR5 are based on analysis that utilizes the mathematical techniques of either regression line analysis or Gaussian distributions. The primary assumption in either technique is that, in a data set series all data assembled is attributable to the given population ascribed to the system being examined. In the event that a radical change suddenly occurred in the system being examined, the final series of data may well belong to an entirely new system reality, but in the case of regression line analysis would be smoothed into the prior data, and in the case of Gaussian distributions would merely extend the range of the distribution, thereby merely implying an increased range of natural variability.</p> <p>In either of these events the final data entered into a given analysis could lead directly to a gross misinterpretation of the actual, as opposed to the theoretical, state of the system being examined and in particular the actual state of the climate.</p> <p>3. Metrics are defined within the Synthesis Report but the questionable use of GWP for the calculation of CO₂eq, and in particular the implications of the methane component of the composite number, could be grossly misunderstood, even by some members of the scientific community.</p> <p>There is considerable scientific evidence, derived from the Paleoclimate record, that</p>	<p>It's a Panel decision to have a SPM. However, points well take to improve SPM</p>
-----	---	--	--	--	--

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>There are two items that should be considered for inclusion in the Synthesis Report.</p> <p>1. An appendix should be added that lists the dates of the last scientific, or other data, used to assess the defined areas of AR5. The 'actors' and 'agents' who may be involved in formulating policy relative to AR5 may include representatives of business and the military; both of these groups rely on what scientists would define as 'cutting edge' data in the normal course of their decision making. An appendix of this nature would allow them to more thoroughly assess their level of confidence in assessing the risks posed for a given areas, or factors, influencing the climate.</p> <p>For instance data relative to the Arctic sea ice area, contained in the Summary for Policymakers of WG1, figure SPM2.7(b), shows 'data' up to 2005 then merely projections of the Arctic sea ice area beyond 2006. Given the number of models devoted to projecting the area of the sea ice it is apparent that this subject has been considered serious enough to warrant considerable expenditures. The reality that many of these models do not come even close to observable data (via CryoSat-2) is one issue. Another issue is that the models only project area, and not the projected volume decline, a rather critical issue. Overall it is mystifying that the only proven, as opposed to theoretical, data being considered is now over 8 years old and raises serious questions regarding the value of AR5 as a basis for policy making.</p> <p>A simple experiment, which could be performed by a child, highlights the potential severity of ignoring the volume decline of the Arctic sea ice. If one places an ice cube in a beaker of water, and observes the melting characteristics, it is notable that the volume of the cube declines much more rapidly than the observable surface area. This implies that it is critical to understand the actual volume decline characteristics of the sea ice in order to accurately extrapolate the potential timing of even a portion of the melt season resulting in less than 1 million km² of remaining sea ice. On the basis of the proposed experiment even a partial melt-out could be a very abrupt event leading directly to immense interrelated consequences that would be extremely difficult to mitigate or reverse.</p> <p>2. An additional appendix, or section, should be considered to highlight those areas, or factors, that should receive close and increasing scrutiny by the scientific community, i.e., 'Recommended On Watch'. Scientists would probably benefit by the inclusion of this item in obtaining the necessary grants to support their research. The 'actors' and 'agents' would benefit in that they would have a clear indication where it may be appropriate to examine so-called "cutting edge" information to make a thorough assessment from their perspective; a perfect example would be the insurance industry.</p> <p>[Harold David Tattershall, United States of America]</p>	The outline of the SYR has been decided by the Panel
-----	---	--	--	--	--

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0			<p>1. There are no statements, even vague intimations, within the Synthesis Report that the climate is in a non-linear and thus a potentially highly volatile mode. The reason is more than likely due to the methodology employed in the IPCC process, in that it would require a series of peer reviewed papers defining the exact basis of why researchers could make this assertion. The likelihood of widespread scientific agreement to such assertions could be realistically considered at best as low; potentially a major reason why no research scientist has attempted to author a paper of this nature.</p> <p>An alternate approach to the IPCC process, for this subject matter, would be to use the disruptive thinking techniques of Edward de Bono. Edward de Bono may not be a scientist but then again neither are the economists who contributed to AR5. Using de Bono logic, to examine non-linearity, it resolves to an understanding of the first principal of algebra; the 'equals' sign, i.e., the left hand side of any equation must equal the right hand side. If on the left hand side one is attempting to assess whether or not the climate is in either a stable (within natural variability), linear change (from natural variability), or non-linear change mode, then the right hand side must contain those factors and elements that would be used to assess and quantify the resulting state. To some extent this is already being attempted by those modeling the climate in computers.</p> <p>Again employing de Bono logic one can examine some of the known and quantified factors that would constitute elements on the right hand side of the equation. The decline of the Arctic sea ice is cubic in nature (as confirmed by readings from CryoSat-2, the analysis by PIOMAS http://psc.apl.washington.edu/wordpress/research/projects/arctic-sea-ice-volume-anomaly/, and the analysis of PIOMAS data at the Artischepinguin site https://sites.google.com/site/artischepinguin/home/piomas/), and there is considerable published peer reviewed research that discharges from both Greenland and the Antarctic are increasing at an exponential rate. Thus on the right hand side there are minimally 3 components that are exponential by definition (it is beyond debate that there are others but these should suffice to make the point). One can add to the foregoing those factors where extreme events have considerably exceeded the established normal distributions of natural variability by setting 'records' for certain climatic events, i.e., temperature records, floods and droughts; these factors would be singular non-linear variables impinging on the whole.</p> <p>Viewed in total it is arguable using de Bono logic that the climate is at a minimum in a non-linear mode and given all that interacting non-linear factors on the right hand side of the equation it is further arguable that the climate is in a hyper non-linear mode. The only way to counter this argument would be to deliver peer reviewed research of factors that would completely offset the identifiable non-linear components used to</p>	The outline of the SYR has been decided by the Panel
-----	---	--	--	---	--

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				Overall very clearly stated for politicians, general public, and scientists alike. Excellent. Stating the degrees of confidence is a brilliant innovation. Define very visibly "likely, very likely, medium confidence",... etc at the beginning of the SPM (in the introduction of the spm). I found the definitions some 30 pages later in the Introduction Box1. Not good: make a mini-box in SPM. In the following comments, original text is in square brackets [] [Alessandra Conversi, United Kingdom]	footnote in intro SPM
SPM	0				Characterization confidence levels has not used in homogeneous way, it is in some phrases in bold and others not [Government of Chile]	editorial, accepted
SPM	0				It should be stated that the numbers in curled brackets refer to the chapters/subchapters of the Synthesis Report and that the reference in brackets to figures refer to figures of the Synthesis Report. [Government of Austria]	editorial, accepted
SPM	0				It should be stated that the numbers in curled brackets refer to the chapters/subchapters of the Synthesis Report and that the reference in brackets to figures refer to figures of the Synthesis Report. [Government of Austria]	editorial, accepted
SPM	0				It is not clear why some paragraphs in the SPM start with a bolded sentence whilst others don't. For consistency it would seem wise for either all or none to start with such a bolded sentence. [Peter Thorne, Norway]	we will use bold where appropriate
SPM	0				Figure 1.6 seems very important in order to understand what contributed in the past to growth and reductions in GHG emissions. This figure should therefore move to the SPM as is. [Government of Austria]	rejected due to space limitations
SPM	0				SYR-46, lines 1-9 should also be given in the SPM as it explains what drives differences in climate change risks (vulnerabilities). [Government of Austria]	Vulnerability mentioned in revision in topic 1, however, space limitations in SPM don't allow level of detail requested
SPM	0				It is noted that for the time being there is no glossary available for the SYR. Such glossary seems to be of great importance - in particular keeping in mind that different WGs used different definitions for the same term. [Government of Austria]	noted
SPM	0				SYR-65, lines 6-21 should be included in the SPM because of its high policy relevance as a statement with high (very high) confidence that addresses very significant potential impacts in the near future. [Government of Austria]	rejected . Is already in SPM in summarized form
SPM	0				SYR-66, lines 10 to 13 should be included in the SPM because of its high policy relevance as a statement with very high confidence that addresses very significant potential impacts in the near future. [Government of Austria]	rejected. Is already in SPM in summarized form

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				The high level message on SYR-73, lines 5 to 7 should also be included in the SPM due to ist high policy relevance. [Government of Austria]	The highlight stating that " Climate change will inevitably lead to a range of transformations and alterations in natural and 5 human systems, as a result either of responding to climate change or of failing to do so. While failure to respond increases risks, transformational responses can contribute to sustainability."was deleted because it received many critical comments.
SPM	0				The high level message on SYR-73, lines 25 to 26 should also be included in the SPM due to ist high policy relevance. [Government of Austria]	The highlight stating that " Climate change will inevitably lead to a range of transformations and alterations in natural and 5 human systems, as a result either of responding to climate change or of failing to do so. While failure to respond increases risks, transformational responses can contribute to sustainability."was deleted because it received many critical comments.
SPM	0				The high level message on SYR-74, lines 1 to 2 should also be included in the SPM due to ist high policy relevance. [Government of Austria]	reject. Bland statement
SPM	0				It is strongly recommended to include the key message included in SYR-116, lines 8 and 9 in the SPM due to ist policy relevance. [Government of Austria]	This finding, "The reduction of subsidies for GHG-related activities in various sectors can achieve emission 8 reductions, depending on the social and economic context" was included in the SPM as "At the same time, reducing subsidies for GHG-related activities in various sectors can achieve emission reductions, depending on the social and economic context (high confidence). {4.4.2.2}"
SPM	0				It would be much more logical (A) to start this part (SPM) with the main drivers of climate change (from page 8 line 7 to page 9 line 16), (B) to be continued with the key indicators of the change (which are now with some overlap described from page 5 line 24 to page 6 line 23 and from page 9 line 18 to page 10 line 17), (C) followed by the impacts (which are mentioned now from first lines of page 7). [Government of Hungary]	order of SPM has been changed
SPM	0				For SPM, Figure SPM.7 and Table SPM.1 are too detailed. Legends in individual figures and tables seem to be too long. [Akihiko Murata, Japan]	rejected. Approved figure from WG II
SPM	0				How about a one-page well designed infographic of the most-most important charts, together with very consise text of the most important messages of AR5? [Government of Hungary]	not within our mandate

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	0				The structure of the SPM does not follow that of the AR5, i.e. the three main groups of topics, organized in books by WGs. Suggest to keep the structure of AR5, only have three main chapters, and discuss "pathways" and "measures/policies" within the same chapters. This structure would also avoid the current confusion that issues related mitigation, adaptation and others are discussed in detached sections. [Government of Hungary]	rejected, Panel decision
SPM	0				(Whole SPM) The issue of the global economic cost of climate change impacts (and adaptation) is not explicitly mentioned in the SYR SPM, although it appears implicitly in the 'burning amber' graph (Figure SPM-9, D. 'Global aggregate impacts' reason of concern. Further information on this issue would be required in the SYR and, if possible, in the SPM. On P85, estimates of the incremental aggregate economic impact of emitting a ton of carbon dioxide are discussed indicating large uncertainties. This may need to be briefly mentioned in the SPM text. [Government of France]	has been revisited in topics 3 and 4, and the SPM
SPM	0				SPM as a whole feels too long and unbalanced. In particular Section 3 seems disproportionately long compared to all remaining sections. There needs to be a degree of balance in how much space each WG gets and at the moment it feels like WG3 gets about half the text and the remaining two a quarter each. There may be a case for not exactly balancing the amount each WG's findings get but this feels like it is not necessarily proportionate. It feels like the SPM as a whole should be 3-5 pages shorter with most of the cut coming from sections 3 and 4 which contain disproportionate levels of detail and are relatively speaking wordy. [Peter Thorne, Norway]	sections 3 and 4 have been revised significantly
SPM	5	1	5	16	Legend figure 1 : it should be completed to explain what are the different sources (datasets) plotted on the different figures and what the error bars represent in the middle panel. [Government of France]	Reject, level of detail not appropriate to SPM, however, the crossreferenced figure in the extended report links to datasets
SPM	5	1	27	1	Water resource is a very important issue for human life. The precipitation linked with water resource closely. SYR referred to precipitation much less than temperature and sea level. It should add the projection maps of precipitation (such as WG1 SPM figure8b) and provide the evaluation of precipitation as simulated by the climate models. [Zong-Ci Zhao, China]	Figure SPM7b (precipitation projections) is now included.
SPM	5	1	27	1	In my view the message on p69, lines 5-7 is somehow lost or at least too weak in the SPM; I think this should be strengthened [Helmut Haberl, Austria]	It's now in SPM 2.4

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	1	27	12	<p>General comments on the whole SPM:</p> <p>SPM is aiming to provide a better understanding of main findings gained through AR5s, particularly for policy-makers. Unfortunately most sections are mixtures of different materials and are not suits. For instance, key findings and messages of the WGII are treated very little or ineffectively presented. Also it is very difficult to figure out the key findings and messages across working groups. Therefore it would be much nicer if everything will be written in more comprehensive and clear as policy makers would prefer to take any messages written in shorter, easier and clearer. We would like to make some suggestions considering structure, presentations and comprehensiveness, which would improve communication with readers and none scientific audiences in following comments. [Government of Republic of Korea]</p>	This has been a major focus towards the Final Draft, as well for the texts as for the figures.
SPM	5	1	27	12	<p>The terms of low, medium, high confidence are used repeatedly in this section but not defined until next chapter (Introduction, p30). Where are they defined? What do they mean statistically: 90%, 95%, or 99%, respectively? Are they referenced to the same or different degrees of freedom? The authors should define them or mention the Guidance Note on Uncertainty somewhere prior to or in this chapter. [Government of United States of America]</p>	It's now explained in the introduction to the SPM (footnote)
SPM	5	1	27	12	<p>This report should strive for the highest standards of clarity. This draft should be thoroughly scrubbed to make it more understandable to a lay reader. In some places (the boxes and some of the bold sentences), it is clearly drafted. In others, it is overly dense and inaccessible. Sentences should be simple, direct, and declarative. The figures should be clearly understandable. Many are quite good, but several figures are very unclear, generally either because they attempt to convey too much information and do not focus on what is essential, or because they are poorly labeled. [Government of United States of America]</p>	This has been a major focus towards the Final Draft, as well for the texts as for the figures.
SPM	5	1	27	12	<p>Grey-box headlines sometimes fail to crystallize the key messages / findings from the underlying text. [Government of United States of America]</p>	We have extensively worked on the headlines to improve exactly this.
SPM	5	1	27	12	<p>The term "agreement" has multiple meanings, particularly for non-technical policymakers. Is this agreement between scientific experts, between data sets, between models, etc.? This should be clarified explicitly in the summary (e.g., p. 30, line 36 ff.). [Government of United States of America]</p>	It's now explained in the introduction to the SPM (footnote)
SPM	5	1	27	12	<p>The various RCPs should be placed in context with recent and current rates of emissions. For example, RCP8.5 is business as usual. [Government of United States of America]</p>	There is a box on RCPs now.
SPM	5	1	27	12	<p>Much of the chapter is focused on limiting warming to less than 2C, but no context is provided as to why this is a critical level to avoid exceeding. The summary should briefly state why. [Government of United States of America]</p>	The focus is now not only on 2°C, but also on other temperature levels (e.g. Box Art2)

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	1	27	12	Given the importance of regional differences in the climate change signals and impacts, and their consequences for adaptation, the summary should include a statement that the signals and impacts of climate change will be much greater (and smaller) than the global means in some regions and sectors. Such a statement also will help neutralize criticisms such as "only 2C warming is not a big deal". [Government of United States of America]	This is now being emphasised in Box 2.4 / figure 2.2 / figure 1.1 panel b and e.
SPM	5	1	27		We wonder why some paragraphs begin with bold statements and others not, even if they begin with an important statement? This should be handled in a uniform way throughout the SPM. [Government of Germany]	This has been improved in the Final Draft
SPM	5	3	5	7	The introductory section to the SPM would profit from mentioning the increased knowledge base for the AR5 cycle, allowing for a more robust assessment that supports policymaking (likewise in the overall SYR Introduction). [Government of Switzerland]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	3	5	19	We believe that you will need to include some text in the introduction section that describes the certainty language used. Both the use of level of confidence, assessed likelihood of an outcome or a result and statements of facts should be described as it has been done for the other WG reports. [Government of Norway]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	3	5	19	To explain for the readers the use of referencing. Please consider to include language like e.g. "The basis for this SPM can be found in the Synthesis report, where further references to the underlying working group reports are given. All references are given in curly brackets.". [Government of Norway]	accepted
SPM	5	3	5	19	The SPM should include a footnote that briefly introduces the IPCC calibrated uncertainty language. This footnote can also further direct readers to the discussion in Box Introduction.1 on page 29 of the SYR. [Government of Canada]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	3	5	19	Introduction: Consistent with the approved SPMs for the WGS, we suggest that the introduction needs to clearly explain the purpose and scope of the report. The way some statements are currently worded in the Introduction could be read to imply that they are 'findings' and this can lead to confusion. There is also the appearance of some repetition with the introduction (further comments below). In some cases, the wording used in the introduction to the underlying SYR (on pg 29) is preferable to the current text in the SPM. [Government of Canada]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	3			Introduction : the introduction should explain the added value of the SYR with respect to the working group contributions and two special reports : cross-cutting issues, integrative approaches, novelty with respect to AR4 SYR... (for example, the evidence for human influence has grown since AR4). [Government of Belgium]	The intro SPM will now include it's sources and uncertainty explanation

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	4	5	19	The introductory paragraphs should be rewritten. They should either provide prefacing information to help the reader understand the nature of the report, or they should focus on the most important information from this report. They currently do neither, and as a result provide a weak introduction to a very important report. Delete the second through fourth paragraphs. Instead, focus the introduction on the more important pieces of information to convey to the reader, in essence: the planet is warming, humans have caused it, society and the environment are feeling impacts now, these impacts will get much worse in the absence of additional mitigation and adaptation, there are many options for mitigation and adaptation and synergies between them, and the costs of mitigation are low in comparison with the costs of the projected impacts. [Government of United States of America]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	5	5	6	Readers might have different views what the main findings of the AR5 are. The corresponding sentence in the SYR of AR4 was: This Synthesis Report is based on the assessment carried out by the three working groups of the IPCC. It provides an integrated view of climate change as the final part of the AR4. The latter concept should be also followed by the SYR of AR5. [Government of Austria]	accepted
SPM	5	5	5	7	We would like to strengthen the first two sentences to better express that the SYR synthesizes and integrates (see Scope, Content and Process for the Preparation of the Synthesis Report (SYR) of the IPCC Fifth Assessment Report (AR5) (Scoping Document)). We suggest to rephrase these two sentences to: "This Synthesis Report (SYR) puts the main findings of the three Working Group contributions and both Special Reports of the AR5 cycle (include footnote) into perspective relative to each other. It draws conclusions beyond those that were possible in each of the other AR5 reports individually." FOOTNOTE: Climate Change 2013: The Physical Science Basis, Climate Change 2014: Impacts, Adaptation and Vulnerability, Climate Change 2014: Mitigation of Climate Change, Renewable Energy Sources and Climate Change Mitigation, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Government of Netherlands]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	5	5	7	Just as in the full SYR report, I think it should specifically be mentioned here that the synthesis report combines the findings from the WG1, WG2, and WG3 assessments. [Donald Wuebbles, United States of America]	accepted
SPM	5	5	5	19	Opening sentences contain a certain level of duplication can be combined and shortened. [Government of Ireland]	The intro SPM will now include it's sources and uncertainty explanation

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	5	5	19	The Introduction is a mixture of sentences that either explain the structure and style of the SPM (first, second, fourth sentence) or that provide a very short summary of the SPM (third sentence, sentences starting from L 12). These different intentions should not be mixed. We advise not to include a summary of the SYR in the Introduction - that is not what the summary is for. The Introduction should explain the storyline of the four Topics and the Box on Art.2. If you do not agree to delete the summarizing elements in the Introduction, at least the notion of increasing risks with increasing warming should be added and some sentence on response options to climate change. [Government of Germany]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	6	5	7	Please consider to explicitly mention the two Special Reports that are included in the AR5 cycle. Namely the "Renewable Energy Sources and Climate Change Mitigation" (SRREN) and "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation" (SREX). An alternative approach could be to mention all five reports that are part of the fifth assessment cycle in a footnote. [Government of Norway]	accepted
SPM	5	6	5	7	<ul style="list-style-type: none"> • The SPM of SYR should focus on 3 approved SPMs (WGI, WGII, WGIII) and should use approved texts as much as possible in order to assure successful outcome of AR5. This will avoid not re-negotiating texts in SPM of SYR and SYR as a whole. • For example, SPM of FOD of SYR (P5, L6-7) refers underlying Working Group contributions. This shall be replaced with exact reference of SPMs (WGI, WGII, WGIII) which are long-hour negotiated and approved outcomes of AR5 reports. [Government of Saudi Arabia] 	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	7	5	7	It would be good to add footnote reference at the end of the sentence. The footnote will remind to reader the the 3 working group contributions (Volume 1, Volume 2 and Volume 3) and the two special reports [JACQUES ANDRE NDIONE, SENEGAL]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	7	5	7	to name the two special reports and add after Special Reports, Namely: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) and Renewable Energy Sources and Climate Change Mitigation. This is in order not to confuse the reader with earlier special reports. [Nedal Katbeh-Bader, Other - Palestine]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	7	5	7	Please consider adding: "It provides strategies to cope with climate change by both adaptation and mitigation, and gives scientific information related to the long term objective of the UN Framework Convention on Climate Change (Article 2)". Please consider adding thereafter the Article 2 box from page 118 in the SYR to give the right context. As a minimum, please consider to explicitly refer to the Art 2 box in the introduction section of the SPM. [Government of Norway]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	7	5	7	It would be appropriate to mention the titles of the two Special Reports at the end of this sentence [Government of Kenya]	accepted
SPM	5	7	5	7	We recommend to add the description of the two SRs: SREX and SRREN. [Government of Germany]	accepted
SPM	5	7	5	7	Is it worth being explicit here that the 3 underlying WG reports and the two special reports have already been published? Its implicit already but it may be worth being explicit for the avoidance of doubt on the part of the reader? [Peter Thorne, Norway]	accepted
SPM	5	7			Given that they were products of the AR5 cycle, suggest identifying the titles of the two Special Reports. [Government of Canada]	accepted
SPM	5	7			• SPM SYR [P5 L7] insert details of special reports. [Government of Saudi Arabia]	accepted
SPM	5	7			Although the AR5 WG and Special Reports are referenced later in the report, it would be useful to reference them here as well, as footnotes. [Government of United Kingdom of Great Britain & Northern Ireland]	accepted
SPM	5	7			At the end of line mention the names of the reports (Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) and Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN)). [Government of Maldives]	accepted
SPM	5	9	5	9	to add at the beginning of the sentence: The climate is changing and the human interference [Nedal Katbeh-Bader, Other - Palestine]	sentence deleted
SPM	5	9	5	9	to change: and climate change poses to: and this change poses [Nedal Katbeh-Bader, Other - Palestine]	sentence deleted
SPM	5	9	5	9	Use of the word "interference" implies deliberate intent. That's not accurate in this context. [Government of United States of America]	sentence deleted
SPM	5	9	5	9	Climate has likely been changing longer than humans have existed. Should refer to the rate or specific type of change. [Government of United States of America]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	9	5	10	The sentence starting 'Human interference...' may be better placed after, rather than before, the following sentence, which relates to the nature of the report and itself links to the previous paragraph. [Government of United Kingdom of Great Britain & Northern Ireland]	sentence deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	9	5	11	This paragraph contains some assessment conclusions (it is not just describing the topics of the SPM), it should then have line of cite to the corresponding SYR topic [Thomas Stocker/ WGI TSU, Switzerland]	paragraph deleted
SPM	5	9	5	14	We would suggest to simplify these four sentences, since SYR should be written in a non-technical style, suitable for policy makers (see Scoping Document). We would like to avoid ambiguous terms like 'human and natural systems'. We suggest to rephrase these two paragraphs to: "The climate system will continue to be influenced by human interference. At the same time, climate change both poses risks for and affects society and nature. Responding to climate change involves value judgments, including on equity, justice and fairness. This report assesses all aspects of climate change and provides information on how climate change can be managed." [Government of Netherlands]	paragraph deleted
SPM	5	9	5	14	The structure of the sentence starting with "Human interference" could lead readers to assume that climate change in this report refers only to the results of anthropogenic activities (i.e., the UNFCCC definition). It is important to be clear that for this report climate change refers to both anthropogenic and natural climate change. This is an important concept, particularly for understanding subsequent sections in which impacts are attributed to climate change. Suggest also that these two paragraphs could be merged to avoid repetitive statements about climate change impacts (that currently exist in both lines 9-11 and 13-14). A possible revision could be: "Climate is changing due to human interference with the climate system. Climate change poses risks to human and natural systems on a global scale, and responding to it involves collective action on a global scale. Issues of equity, justice, fairness and other values have bearing on the problem. This report assesses all aspects of climate change and provides information to support decision-making in this field." [Government of Canada]	paragraph deleted
SPM	5	9	5	19	The content here has a character of summarising some of the results, rather than providing an introduction to the SPM. It would be useful to do the latter, for example by following the convention in the WG-reports. [Government of Sweden]	accepted
SPM	5	9	5	19	SPM-Introduction: The Introduction of SPM shall be much better including (1) synthesized key findings or lessons across the working group achievement and (2) brief summary of differences between AR4 and AR5. [Government of Republic of Korea]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	9		13	lines 9-10: "and climate change poses risks for human and natural systems", line 13: "Climate change will alter human and natural systems," These two are overlapping and to some extent contradictory. It would be better to modify the 2nd one by deleting its first part, i.e.: Responding to climate change involves issues .. (Same comment for the Intro on page 29) [Government of Hungary]	sentence deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	9			Replace the wor 'Occurring' with 'increasing', the statement should read ' Human Interference with the climate system is increasing' [Government of United Republic of Tanzania]	sentence deleted
SPM	5	10	5	10	better to change "all aspect" to "most aspects" [Hui JU, China]	sentence deleted
SPM	5	10	5	10	Stating "assesses all aspects of climate change and provides information..." in the introduction creates an unrealistic expectation that the SYR provides answers to all questions required by decision makers. In fact, the report lacks detailed regional information at the spatial scales where decision making takes place. I suggest "assesses the main aspects" or "several aspects" [Government of South Africa]	sentence deleted
SPM	5	10	5	10	Please replace "all aspects" by "relevant aspects", because no one can be sure to capture all aspects of climate change. [Government of Germany]	sentence deleted
SPM	5	10	5	10	It may assist the reader here by clarifying what is meant by natural systems as these include the cryosphere, hydrological systems and ecological systems (it is not in the WGII glossary). This is the first time this term is used and natural systems is used in a number of places throughout the document. Fig SPM.2 identifies Physical, Biological, Managed and Human systems. [Elvira Poloczanska, Australia]	sentence deleted
SPM	5	10	5	11	Rewrite and shift the sentence: "The AR5 assesses all aspects of climate change ..." to line 21. [Government of Switzerland]	sentence deleted
SPM	5	10	5	11	It is very unlikely that this report assesses all aspects of climate change. Some aspects might not have been assessed, e.g. due to lack of understanding, data and information - or simply because of the limited scope of the reports and the limited resources available. Hopefully some still missing aspects will be addressed in the final draft of the SPM (see the comment above). [Government of Austria]	sentence deleted
SPM	5	12			Suggested text line for Introduction: It is certain that humanity is trading biodiversity, food security and coastal cities for fossil fuel use. In the mean output of all RCP's the climate of the 21st Century will change by a maginitude comparable to the large changes of the past 60m years but tens of times faster. The ability of complex natural and human interdependent systems to adapt is therefore limited. The risks inherent in such a future can be contained if the CO2 emissions are sequestered, or if fossil fuel use is rapidly eliminated and the RCP 2.6 carbon budget pursued and ideally exceeded. That text should not be a controversial and it uses the word "risk" appropriately. The word risk implies that something may not happen which is an inaccurate possibility to entertain given the maginitude of contemporary human caused CO2 emissions. It is important that the nature of the trade is made clear to policy makers and climate model uncertainty is not allowed obscure the scientific facts. [Michael Casey, Ireland]	The intro SPM will now include it's sources and uncertainty explanation

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	13	5	13	Please consider to change "Climate change will alter...." to "Climate change is altering". Rationale: One very strong and firm message that has been established by the working group reports is that the climate system is already changing. [Government of Norway]	sentence deleted
SPM	5	13	5	13	Suggest revision. "...will alter..." suggests that climate change has not yet altered human and natural systems. Suggest replace with "...has altered and will continue to alter...". [Government of Australia]	sentence deleted
SPM	5	13	5	13	The word "will" should be changed to "is projected to" to be consistent with the WG2 SPM. [Government of United States of America]	sentence deleted
SPM	5	13	5	13	The phrase "responding to it involves" is too prescriptive. The authors should revise the text to read: "...responding to it CAN involve..." or "... responding to it may involve ethical considerations, including issues of ..." [Government of United States of America]	sentence deleted
SPM	5	13	5	13	In light of the previous paragraph and Figure SPM.2, it would be more appropriate to say "Climate change is and will continue to alter human and natural systems..." [Government of United States of America]	sentence deleted
SPM	5	13	5	14	This paragraph contains some assessment conclusions (it is not just describing the topics of the SPM), it should then have line of cite to the corresponding SYR topic [Thomas Stocker/ WGI TSU, Switzerland]	sentence deleted
SPM	5	13	5	14	Local scale should be added [Government of Ecuador]	sentence deleted
SPM	5	13	5	14	While all the factors listed in the first sentence are important considerations in responding to climate change, they are not the only issues. In general, we suggest the SPM should avoid creating "lists" of factors, as it is difficult to make these fully balanced and exhaustive. If retained, this sentence could be followed by at least a partial listing of the other issues, such as technology development, that affect responding to climate change. [Government of Canada]	sentence deleted
SPM	5	13	5	14	Ethic should be mentioned as a further issue. [Government of Germany]	sentence deleted
SPM	5	13	5	14	• SPM [P5 L13-14] As per the scope of the SYR, the introduction should frame the climate and human systems. [Government of Saudi Arabia]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	13	5	19	This part of the preface of the SYR deals with the description of essential issues, but the partial statements are not consistent with the original report, for example what is collective action problem? Here the risk management has been mentioned, but there is no further description in later part. It is suggested that the preface and subsequent parts be revised and improved. [YIHUI DING, China]	paragraph deleted
SPM	5	13		14	Move these lines (13 to 14) into line 10 before the last sentence so as to keep consistency with the SYR introduction. [Government of Maldives]	sentence deleted
SPM	5	13			Replace 'wil' wit 'is' and the statement should read 'Climate Change is altering human and natural systems,....' [Government of United Republic of Tanzania]	sentence deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	14	5	14	The word "value" requires qualification. As it seems to be taken out from the WGIII SPM, it should be "value judgements". On the contrary, if it refers to economic aspects of climate change, the term should be reconsidered and, possibly, a new sentence added to explain these aspects. [Government of Brazil]	sentence deleted
SPM	5	14	5	14	"at the global scale" should be expressed as "both at the global scale and various regional scales". [Hui JU, China]	sentence deleted
SPM	5	14	5	14	to add after the global scale: and in an integrated manner. [Nedal Katbeh-Bader, Other - Palestine]	sentence deleted
SPM	5	14	5	14	Substitute "collective action" for common. Climate Change is a common concern or problem at the global scale, collective action could be read as prescriptive. This phrase ignore UNFCCC principles on CBDR and respective capabilities. [Government of Venezuela]	sentence deleted
SPM	5	14	5	14	Value is used in very different context in the SPM as well as in the SYR. In order to add clarity a qualifier is needed in order to convey the right message. It seems that "societal values" might cover better the message the authors want to convey to the reader. [Government of Austria]	sentence deleted
SPM	5	14	5	24	I suggest to change "larger" for the largest [Carlos Méndez, Venezuela]	sentence deleted
SPM	5	14			This phrase is difficult to translate. Suggest replacing with "it is a problem requiring collective action at the global scale." [Government of United Kingdom of Great Britain & Northern Ireland]	sentence deleted
SPM	5	14			to add the principle of common but differentiated responsibilities under UNFCCC mandate with emphasis GHG reduction commitments ambitious of the developed countries and according to the science. [Government of Nicaragua]	paragraph deleted
SPM	5	14			It is not clear what is meant by the term "value" in this sentence. Suggest additional clarity [Government of Ireland]	sentence deleted
SPM	5	16	5	16	It would be useful to provide a reference to Box Introduction.1 when talking about uncertainty in line 16. This will help the reader to understand the uncertainty language in the SYR at an early stage. As it currently stands, the reader would only get familiar with the uncertainty qualifiers after entirely going through the SPM. [Government of Switzerland]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	16	5	16	The sentence: "The challenges presented by climate change involve many uncertainties" should better read: "The uncertainties related to climate change present a significant challenge in addressing climate change risks." [Government of Austria]	sentence deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	16	5	17	I wonder if a phrase like 'the challenges presented by climate change involve many uncertainties' is a good thing to place so prominently. I think that this gives the immediate impression that there is no need to read any further because we aren't sure about anything. Rather we should simply say, 'Responding to climate change involved managing risks ...and delete the preceding text'. [Rachel Warren, United Kingdom]	sentence deleted
SPM	5	16	5	17	"wide range of possible outcomes" may be difficult to understand for policymakers : please clarify. [Government of Belgium]	sentence deleted
SPM	5	16	5	17	Again the sentence lacks the necessary clarity. The corresponding paragraph on page 22, lines 3-7 is much clearer. It is suggested to keep the message in the introduction simple by saying: Responding to climate change involves managing risks. [Government of Austria]	sentence deleted
SPM	5	16	5	19	We think this paragraph is too generalized to clearly convey the message that is intended. We suggest to rephrase it to: "Dealing with climate change involves different types of uncertainty, such as future emissions and the exact response of the climate system. Policies need to take into account the risks of climate change and damages caused. Despite the challenges, there are many opportunities to limit climate change, and to reduce its impacts and the risks associated." [Government of Netherlands]	paragraph deleted
SPM	5	16	5	19	The last sentence in this para is unclear and unspecific. Please consider to mention that reducing this risk involve immediate global action to implement both mitigation and adaptation strategies. We would like to see findings that describes the urgency and that it is time to act. [Government of Norway]	paragraph deleted
SPM	5	16	5	19	The paragraph thoroughly conveys challenges and risks. Should give equal weight to (expand on) "opportunities" and "synergies with other... objectives" - mentioned, here, as something of an afterthought - to reflect mitigation's potentially cross-cutting co-benefits, consistent with the rest of the SYR (e.g., SPM, p. 27, l. 4-12; Topic 3, p. 86, l. 41-45; Topic 4, p. 96, l. 33 and p. 113, l. 8-10) and WG3 report; see, e.g., WG3 SPM, p. 5: "Climate policy intersects with other societal goals creating the possibility of co-benefits....intersections...can strengthen the basis for undertaking climate action." [Government of United States of America]	paragraph deleted
SPM	5	16	5	19	It feels a little unbalanced that the only opportunity will be to reduce the impacts. In reality there will be some opportunities in some regions / sectors. While true that the opportunities are outnumbered by the risks the implication the reader gets here is a little too black and white that climate change will only have negative impacts. Some effort here to provide balance may be useful. [Peter Thorne, Norway]	sentence deleted
SPM	5	16	5	19	Should reverse the order of the sentences to have uncertainties listed in the 2nd and not as the first point. [Government of France]	paragraph deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	16			As well as the mention of "many uncertainties", include concept of a large body of robust science provided in the report. [Government of Ireland]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	17	5	17	better to give a box to define the "managing risks" within climate change scope [Hui JU, China]	paragraph deleted
SPM	5	17	5	17	Should it be "managing risks under uncertainty" - I assume you wrap the uncertainty into "risk", but many policy folks will misunderstand this - particularly for example when you are talking about extreme events, where you are convolving two sources of uncertainty - the likelihood of the extreme and the probability of the climate change scenario, which gets confusing. [Government of United Kingdom of Great Britain & Northern Ireland]	sentence deleted
SPM	5	17	5	19	It is stated that "...there are many opportunities to build on synergies with other social, economic and development objectives". Among the objectives mentioned, perhaps also environmental objectives could be added (such as conservation of biodiversity) [Government of Sweden]	sentence deleted
SPM	5	17	5	19	Suggest the text here could be rewritten to refer to the "co-benefits" that can be achieved by addressing climate change related risks. This phrasing would be more easily understood than the current one, referring to synergies. Suggest this sentence could be shortened and rephrased as follows: "Opportunities exist for reducing the risks related to climate change while achieving co-benefits for a broad range of social economic and development objectives." [Government of Canada]	sentence deleted
SPM	5	18	5	19	The sentence should end with a message that says that reduction by availing opportunities is not cost less. [Government of India]	The intro SPM will now include it's sources and uncertainty explanation
SPM	5	19	5	19	We consider development objectives rather as a subset of social and economic objectives. It is unclear why this is named explicitly here. Maybe something like "social, economic and especially development objectives" is better. [Government of Germany]	sentence deleted
SPM	5	19	5	19	Add "environmental" objectives. WG3 report and rest of SYR (e.g., SPM, p. 24, l. 55-56; p. 26, l. 51) consistently capture the intersection of climate action with other social, economic, development, and environmental (e.g., ecosystem preservation) objectives. [Government of United States of America]	sentence deleted
SPM	5	19			to add in the analysis other conventions that are directly related to climate change such as drought and desertification, biodiversity, Montreal Protocol, inter alias. Including the provision of financial resources for adaptation. [Government of Nicaragua]	sentence deleted
SPM	5	20	5	21	• SPM [P5 L20-21] A box on uncertainty is required here [Government of Saudi Arabia]	a footnote has been included

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	20			We suggest to include here an overview of the topics, because this helps the reader to understand the structure of the report. Please include: "The first topic gives an overview of observed changes, subsequently scenarios of future change are presented. The third topic is on possible transformations in systems. Finally topic four lays out adaption and mitigation measures." [Government of Netherlands]	accepted, has been included
SPM	5	21			Again to keep consistency with the underlying report, a small paragraph about the uncertainties needs to come in here at the introduction for the setting of the scene referring to the box in the underlying report. [Government of Maldives]	a footnote has been included
SPM	5	22	5	22	We suggest to add and Their Causes after Observed Changes for consistency with the title of topic 1 [NIRIVOLOLONA RAHOLIJAQ, MADAGASCAR]	Accepted.
SPM	5	22	5	22	1 Observed Changes, suggestion is 1 Observed Changes and their Causes [Zong-Ci Zhao, China]	Accepted.
SPM	5	22	5	22	Suggest the title should be "observed changes and their causes", consistent with the underlying report. [Government of Canada]	Accepted.
SPM	5	22	5	22	The present title is "Observed Changes". The paragraph on adaptation on line 27-29 raises question in this context. The short text on adaptation does not seem to fit here. Please move this paragraph to the section on adaptation. [Government of Finland]	Taken into account. Text revised to make clearer why "adaptation experience" is covered under "observed changes".
SPM	5	22	5	38	Suggest considering whether observed changes and their confidence level could be presented in a more integrated way (e.g., in table format). [Government of Canada]	Taken into account. A table would not support the narrative, but structure and flow have been revised. Chapeau and subtitles have been added.
SPM	5	22	10	17	The section on observations (Topic 1) provides detailed information on changes in the physical system but lacks information on observed impacts. Please include in particular information on food security and ecosystem services, preferably in additional figures. [Government of Germany]	Taken into account.
SPM	5	22	10	17	A change in the order of the different paragraphs that constitute the section Observed Changes, would help to a better development and clarify the section. I show a proposal in the following comments: [Maria Carmen Llasat, Barcelona]	Accepted. Structure and flow have been revised. Chapeau and subtitles have been added.
SPM	5	22	10	17	The chapter on observed changes lacks a clear structure. This results i.a in some repetition, e.g. information with respect to the increase in GHG emissions in the period 1970 to 2010. The information with respect to attribution/human influence is unclear and can be found in various parts of this chapter. It is suggested to restructure the chapter with the goal to add clarity and to avoid repetition. [Government of Austria]	Accepted. Structure and flow have been revised. Chapeau and subtitles have been added.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	22	10	19	The way this first section reads is not very eloquent. The section starts describing the warming of the system as well as how this is presented (first three bold paragraphs); then, an adaptation insight is provided (fourth bold paragraph); finally, insights on atmospheric emissions increase and its human origin is stated. The more natural way to provide a narrative in this section would be, after first fourth paragraphs, stating explicitly the link between GHG emissions and the warming of the system before jumping into human influence on this. At the moment, it seems a bond is missing in the narrative that makes this first section a collection of paragraphs rather than a needed sequence of findings. If one only reads bold sections among paragraphs one after the other, it is not fully clear how one connects to the other. [Tabaré Arroyo Currás, Mexico]	Accepted. Structure and flow have been revised. Chapeau and subtitles have been added.
SPM	5	22	10	20	The SYR is an opportunity to compare (perhaps in a matrix or diagram) the areas of high/low confidence in attribution of changes in climate to human influences, and the attribution of impacts on society and ecosystems to changes in climate. This would help clarify the differences between attribution statements in WG I and II, and show where attribution across the causal chain may or may not be weak. [Haroon Kheshgi, United States of America]	Noted
SPM	5	22	15	28	The current structure of Sections 1 and 2 is sometimes confusing and it does not entirely follow the agreed scoping of the SYR. We appreciate the attempt to synthesize information across WGs, but the current text lacks a storyline. More specifically: Section 1 does not only deal with observed changes (according to the approved scoping and its title), but also with drivers, impacts (including detection and attribution without clarifying the concept), and even mentions vulnerability and exposure. Section 2 addresses (according to the approved scoping and its title) future climate change, risks and impact, but also causes of future climate change and adaptation. In addition, section 2 mixes statements on future temperature rise with statements on other physical quantities and with statements on the impacts of climate change on natural and human systems, vulnerability, exposure and adaptation, and it has no clear structure according to the time horizon under consideration. Please clarify structure or at least modify titles (e.g. for Section 2 "Future climate changes, causes, risks, and impacts"). [Government of Germany]	Accepted. Structure and flow have been revised. Chapeau and subtitles have been added.
SPM	5	22			Section 1 and 2: The structure of the text is unclear. Something needs to be done to show the logic. Subtitles may help. [Government of Belgium]	Accepted. Structure and flow have been revised. Chapeau and subtitles have been added.
SPM	5	22			The section addresses observed changes and impacts as well as attribution to human influence, this should be reflected in the title. [Government of Germany]	Taken into account. Section heading modified to agree with Topic 1 heading.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	24	5	24	"larger" than what? Fix or drop [Government of United States of America]	Accepted, text revised
SPM	5	24	5	24	well-mixed' greenhouse gases? 'emissions' or 'concentrations' (WG1 SPM has 'concentrations') [Venkatachalam Ramaswamy, United States of America]	Accepted, headline statement modified
SPM	5	24	5	24	Change to: Anthropogenic emisisions and concentrations of ... [Donald Wuebbles, United States of America]	accepted, headline statement modified
SPM	5	24	5	25	The "with larger absolute increases over the last decade" needs a "than...", i.e. a reference for the difference that is highlighted. [Government of Sweden]	accepted, headline statement modified
SPM	5	24	5	25	<p>Although concentration of greenhouse gases had continued to rise BEFORE 1970, this sentence sounds as if the increase had begun SINCE 1970. The SYR should avoid contradictory descriptions among all WGs, while this sentence is only based on Figure SPM.1 in the WGIII, which assessed from 1970 onward.</p> <p>According to the first bullet of page 11 in the WGI SPM, "the total anthropogenic RF...has increased more rapidly since 1970 than during prior decades." The headline statement above it says, "Total radiative forcing is positive, and has led to an uptake of energy by the climate system. The largest contribution to total radiative forcing is caused by the increase in the atmospheric concentration of CO2 since 1750."</p> <p>Although RF and emissions are not necessarily equal, if it is possible, it is better to replace "continue to rise" with "increased more rapidly", for example, in order to avoid the confusion mentioned above.</p> <p>[Government of Japan]</p>	accepted, headline statement modified
SPM	5	24	5	25	We suggest to delete the headline statement since it is a subjective selection of the following section, the bolded statement already give a goode summary, and the headline statement will be difficult to agree upon. [Government of Netherlands]	Taken into account, Headline statement revised
SPM	5	24	5	25	rewrite first sentence of 1, Observed changes headline statement box for clarity: "Emissions of greenhouse gases due to human activity have continued to rise since 1970 with the biggest increases seen over the last decade." [Jonathan Lynn, Switzerland]	Accepted, headline statement modified
SPM	5	24	5	25	Please consider to especially mention CO2 in this sentence that describes the continued rise in anthropogenic emissions since 1970 so that it reads: "Anthropogenic emissions of greenhouse gasses, and especially CO2, have continued to rise since 1970 with larger absolute increases over the last decade". Rationale: When looking at Figure SPM.3 it is very apparent that the dominant growth has been for CO2 since 1970. [Government of Norway]	Taken into account, Headline statement revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	24	5	25	Anthropogenic emissions of greenhouse gases have continued to rise BEFORE 1970. In the WGI SPM, the total anthropogenic radiative forcing has increased more rapidly "since 1970" than during prior decades. The WGI SPM stated that "The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions." This sentence should change according to this description in the WGI SPM or to such as "Anthropogenic greenhouse gases have led to an uptake of excessive energy rapidly since 1970." [Toshihiko Takemura, Japan]	Headline statement revised
SPM	5	24	5	25	"larger absolute increases" looked not clearly. [Zong-Ci Zhao, China]	text revised
SPM	5	24	5	25	IF the order of paragraphs on pages 5-10 does not change (e.g. by starting with information on drivers, as suggested), then we suggest this shaded box begin with the statement from line 29 on page 5 "Warming of the climate system is unequivocal." This is a strong statement and one that is cited often and it deserves to be elevated to the headline box. Having it be the first sentence would then set the stage better for the text that follows, which begins by discussing observed changes to the climate system. [Government of Canada]	Accepted, headline statement modified
SPM	5	24	5	25	Consider whether it is necessary to explicitly call out "since 1970" in the first sentence of this paragraph. Although this wording was approved in the WGIII SPM, when combined with other information in this paragraph using different time periods, it becomes unnecessary - e.g., GHG emissions were also rising prior to 1970 as well. Suggest rephrasing to state "Emissions of greenhouse gases from human activity have continued to rise..." Also, does this statement hold true for emissions of individual GHGs or only for the basket of GHGs, in CO2eq (e.g., we assume this would not be true for methane)? If the latter, suggest revising to say "total emissions...." or refer to CO2 specifically. [Government of Canada]	accepted, headline statement modified
SPM	5	24	5	25	larger absolute increases over the last decade' - where is this coming from? Could not trace it to WG1 SPM. If it was not important enough to be mentioned there, should it be here? [Venkatachalam Ramaswamy, United States of America]	accepted, headline statement modified
SPM	5	24	5	27	Rework to reduce ambiguity and shorten, with a focus on key, specific activities or, sources of emission e.g. use of fossil energy. Open with statement with "Human influence is clear." Start with "Impacts are" [Government of Ireland]	accepted
SPM	5	24	5	27	The box, as every box or paragraph, should have a line of cite [Thomas Stocker/ WGI TSU, Switzerland]	accepted, added

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	24	5	27	This shaded text contains three very important findings which all should be retained in the SPM. They are written in a clear and precise way. [Government of Norway]	Noted, however text was revised in response to other comments
SPM	5	24	5	27	The authors wrote "Anthropogenic emissions of greenhouse gases have continued to rise since 1970..." in the box (line 24 – 27). They also wrote "Warming of the climate system is unequivocal, and since the 1950's, many of the observed changes are unprecedented over decades to millennia" in the line 29 – 30. As far as the reviewer knows, the emission of anthropogenic GHG has risen since 1950's. It would be recommended to check the times to avoid unnecessary confusion. [Young-june Choi, South Korea]	accepted, text revised
SPM	5	24	5	27	The flow of the text in this box is not very logical. It first writes that 'Anthropogenic emissions of GHG have continued to rise since 1970 with larger absolute increases over the last decade'. It then states that 'Human influence on climate change ... is estimated to have been the dominant cause of the warming observed since 1950'. The time frames of the two sentences are confusing. [Government of Switzerland]	accepted, headline statement revised
SPM	5	24	5	27	This opening fails to make the links and the necessary loop that now exists in climate change. It begins with 'emissions', must then move on to GHG concentrations, and then to climate change. The last sentence is great, but then it should be followed by the human response to climate change including both adaptation and mitigation have altered these emissions, thus creating a climate feedback loop that has now been observed: based on the content throughout the SPM, the following could be justified - "Anthropogenic emissions of greenhouse gases have continued to rise since 1970. As a direct response the major greenhouse gas concentrations have increase. This human influence on the climate system is clear, and is estimated to have been the dominant cause of the warming observed since 1950. Changing climate has been linked to impacts on natural or human systems on all continents and across the oceans. In response, humans are adapting to climate change and attempting at a range of levels to mitigate it. Thus the human-natural climate feedback loop is now being observed." [Government of United States of America]	accepted, headline statement modified; however, we aimed at a shorter overall headline statement that does not repeat the sub-headlines.
SPM	5	24	5	27	It is unclear to why 1970 is such an important year (and as such selected for reference) - surely the emissions have been rising before that. Some explanation/justification is needed. Furthermore, this key message talks about the human influence being the dominant cause since 1950, and that makes the 1970 reference even more confusing to the reader. [European Union]	accepted, sentence removed
SPM	5	24	5	27	Please, add before the dates "1970" and "1950" the word "about" or write it as "1950s". It is included in other parts of this SYR (SYR-5 line 29 and SPM, page 2). [Government of Argentina]	accepted, sentence removed

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	24	5	27	Include: Anthropogenic emissions of greenhouse gases have continued to rise (include) "since preindustrial levels" until now 1970 with larger absolute increases over the last decade. Human influence on the climate system is clear, and is estimated to have been the dominant cause of the warming observed since preindustrial levels 1950. Changing climate has been linked to impacts on natural and human systems on all continents and across the oceans [Government of Bolivia]	Headline statement revised
-----	---	----	---	----	---	----------------------------

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	24	7	11	<p>It seems to me there is a vulnerability in the IPCC SYR conclusions on attribution of impacts as it stands, at least in how these might be interpreted. The SYR is where conclusions from the 3 WGs are synthesised and therefore this is where some readers may look to see how impacts can be related to human-induced climate change given that this is not in the remit of either WGI or WGII alone. But this synthesis element is largely lacking in this SYR report; rather it sticks to the line that WGII can only attribute impacts to climate change so nothing more can be said. This is ok as far as it goes, climate change is clearly defined in the IPCC glossary to mean any changes that persist for an extended period and that could be due to internal processes as well as natural and anthropogenic external forcings. But most readers of the SYR SPM are not going to interpret it like that; due to the placing of the headline statement in the box on page SYR-5 with the human influence on the climate system is clear they are going to interpret this attribution of impacts as attribution to anthropogenic climate change. I would be willing to hypothesise that in fact many of the impacts listed at page 7 lines 1 to 11 are associated to some extent with anthropogenic climate change but there is no traceability of that conclusion in to the report that I can see. If one makes that supposition one has to do so outwith the clearly stated conclusions of the IPCC AR5 SYR (maybe by interpreting SYR Topic 1 Fig 1.9 or by a recourse to ones common sense, a recourse that seems to be being encouraged by the proximate placement of the 2 sentences in that box). Maybe it isn't possible to do more explicitly but the SYR actually in a couple of places appears to make some attempt to do this. At SYR-7 line 8 there is the use of the "on-going" word; terrestrial, freshwater and marine species have shifted in response to ongoing climate change. What is the definition of on-going here and is there an implication here that this attribution is explicitly not to climate variability? Then at SYR-39 lines 37-39 an intention is expressed to where possible present connections of impacts to climate change for which human influence has been assessed. But I don't see this in Section 1.4.2. Again the "ongoing" word appears at SYR-43 line 6 and then there is a rather opaque paragraph at SYR-43 lines 32 to 38 and Fig 1.9 that according to the caption that again considers attribution to climate change, rather than anthropogenic climate change. Confusingly this paragraph seems to combine the "human drivers" element with the effects on people element. So my worry is this : people are going to be quoting the SYR AR5 to support statements that anthropogenic climate change has led to impacts on natural and human systems but this statement is not clear and traceably supported in the current report even though this report is supposed to be a synthesis report. One option would be to be bold and attempt a new synthesis statement, another, if the literature really doesn't support such a statement could be to stick to what you have and be more explicit about the nature of the headline statement, for example with a footnote to SYR-5 line 27 that states something along</p>	accepted, headline has been revised to clarify.
-----	---	----	---	----	---	---

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	24	10	17	This summary parrots statements from the big document. Since this is already a synthesis report, and this is the summary of the synthesis, why not just speak about the main points as if speaking to an ordinary person. As mentioned earlier, skip the details and just provide indication where they might be found. Start with observed increase in GHG and indications that it is anthropogenic. Then ocean warming, ice melt and sea level rise. Then extreme weather events (fueled by heat) and ocean acidification. Then less established results, if space permits. Such as... hard to measure effect on ocean circulation (although could be important long term and might be hard to reverse) [Government of United States of America]	rejected, structure consistent with underlying report
SPM	5	24		25	This statement should be more explicit. Suggest rewording "...continue to increase, with the largest increased in emissions observed in the period 2002-2012"? [Government of Ireland]	accepted, headline statement revised
SPM	5	24		27	RETAIN: "Anthropogenic emissions of greenhouse gases have continued to rise since 1970 with larger absolute increases over the last decade. Human influence on the climate system is clear, and is estimated to have been the dominant cause of the warming observed since 1950. Changing climate has been linked to impacts on natural and human systems on all continents and across the oceans." [Peter Carter, Canada]	Noted, however text was revised in response to other comments
SPM	5	24			"Larger" is a comparative term, so the question arises "larger than what". Also the "last decade" will depend on when someone is reading the report. I suggest: "...with larger absolute increases over the decade 2001-2010 [IF THIS IS THE DECADE YOU ARE REFERRING TO] than over previous decades". [David Wratt, New Zealand]	Accepted, text revised
SPM	5	24			Anthropogenic emissions of greenhouse gases have continued to rise since .. Since the regional/national differences in this regard are a rather sensitive issue, it would be better to add "global", i.e.: Anthropogenic emissions of greenhouse gases at global level have continued to rise since .. (same comment for the Intro on page 29) [Government of Hungary]	Accepted, text revised
SPM	5	25	5	25	Suggest revision. The IPCC evaluation process has not been 'estimating' the human influence. "estimated" should be replaced with calibrated language, such as 'extremely likely' [Government of Australia]	Accepted, text revised
SPM	5	25	5	25	estimated' is a weak word - WG1 SMP employed 'extremely likely' [Venkatachalam Ramaswamy, United States of America]	Accepted, text revised
SPM	5	25	5	25	"Estimated to have" is unclear. How about "Human influences on the climate system is clear and was beyond reasonable doubt the dominant cause of the warming observed since 1950." [European Union]	Accepted, text revised
SPM	5	25	5	26	Section 1 also addresses causes of climate change, therefore we suggest using the same title as in Topic 1 ("Observed changes and their causes"). [Government of Belgium]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	25	5	26	The phrase "Human influence ... is ESTIMATED to have been the dominant cause ..." conveys a substantially weaker message than the WGI assessment that this draws upon, which is that "It is EXTREMELY LIKELY that ...". The latter is a more assertive phrase, and it quantifies the likelihood of the statement, while as formulated, the word "estimated" casts doubt (estimates can be wrong) and does so using a term that is not calibrated. Suggest replacing with the stronger wording used by WGI. [Government of Canada]	accepted, headline statement revised
SPM	5	25	5	26	"...and is estimated to have been the dominant cause of the warming since 1950." In this context, it is not clear what "the warming" refers to (presumably this is the observed increased in near-surface air temperatures, but this should be made clear). Furthermore, the best estimate is that the human contribution very closely equals the observed warming, which is stronger than being the "dominant cause." [Government of United States of America]	accepted, headline statement revised
SPM	5	25	5	26	"Human influence on the climate system is clear, and is estimated to have been the dominant cause of the warming observed since 1950." This would be stronger if this provided the level of certainty instead of "is estimated to have". [Government of United States of America]	accepted
SPM	5	25	5	27	The characterization of human influence on the bottom of page 9 is clearer and more compelling. Draw more closely from it for the box. [Government of United States of America]	accepted, headline statement revised
SPM	5	25		25	Suggest replacing the term "estimated" with the qualified confidence and uncertainty terminology normally used in these documents, eg. "likely" or "very likely" [Government of Ireland]	accepted, sentence removed
SPM	5	25			The language used here is weaker than WGI. WGI SPM says 'It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century'. Here it says 'it is estimated to have been'. The WGI wording is consistent with the conclusions in the underlying WGI assessment. Replace 'is estimated to have been' with 'is extremely likely to have been'. [Government of Canada]	accepted, sentence removed
SPM	5	26	5	26	SURFACE warming [Keith Shine, United Kingdom]	rejected, using approved wording, and this is a headline statement - note that surface warming clear from following detail paragraph
SPM	5	26	5	27	WGII used the wording "has caused impacts" rather than "has been linked to". The former is stronger language and should be repeated here. [Government of Canada]	accepted
SPM	5	27	5	27	We suggest to add a statement on vulnerability and risk at the end of the paragraph. For example: Differences in vulnerability and exposure shape differential risks from climate change [NIRIVOLOLONA RAHOLIJAO, MADAGASCAR]	Headline statement revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	27	5	27	regarding "on all continents": WGI SPM states on p. 15 "Over every continental region except Antarctica, anthropogenic forcings have likely made a substantial contribution to surface temperature increases since the mid-20th century". Please check whether "except Antarctica" needs to be inserted. [Government of Denmark]	Headline statement revised
SPM	5	27	5	27	"natural OR human systems on all...." because the climate change effects of the human systems on Antarctica is probably not identified. [Government of United States of America]	accepted, text revised
SPM	5	27	5	27	all continents - Antarctic too? [Venkatachalam Ramaswamy, United States of America]	text revised
SPM	5	29	5	29	Define "unequivocal" consistently with the uncertainty convention used in IPCC reports. [Government of United States of America]	Reject. We use the word in its dictionary definition. Approved language in AR4 and AR5 SPMs.
SPM	5	29	5	29	Include what is in red. Warming of the climate system is unequivocal, and since preindustrial levels the 1950s, [Government of Bolivia]	Noted. Unclear which action is requested.
SPM	5	29	5	30	The authors wrote "Anthropogenic emissions of greenhouse gases have continued to rise since 1970..." in the box (line 24 – 27). They also wrote "Warming of the climate system is unequivocal, and since the 1950's, many of the observed changes are unprecedented over decades to millennia" in the line 29 – 30. As far as the reviewer knows, the emission of anthropogenic GHG has risen since 1950's. It would be recommended to check the times to avoid unnecessary confusion. [Young-june Choi, South Korea]	text revised
SPM	5	29	5	31	These findings are very important and relevant. [Government of Norway]	Noted.
SPM	5	29	5	37	• SPM [P5 L 29-37] of SYR does not provide rate of warming during 1998-2012 period as given in SPM (WGI). [Government of Saudi Arabia]	accepted, now included
SPM	5	29	5	38	why no mention here of 'hiatus'? (WGI, SPM, B.1) [Jonathan Lynn, Switzerland]	accepted, now included
SPM	5	29	5	38	In page 11 and following, the temperature increase is compared to preindustrial levels. Why not to introduce this comparison here too? [Government of Switzerland]	rejected, using comparison to 1880 as there are multiple datasets and approved WGI language
SPM	5	29	6	23	Much of the focus of the SPM is on the physical climate changes in terms of global average temperature only, when an important observation in the WGI full report was that it only accounted for a very small fraction of the total energy gained by the Earth system. This information should be included. The ocean's role is mentioned on p. 6 but doesn't tie this information together. [European Union]	Taken into account. SPM Section 1 has been completely restructured, so that information is better tied together
SPM	5	29	6	29	SPM-Session1: First few paragraphs (line 29 - 28 in page 5 and line 7 - 23 in page 6) are just replication of messages from either boxes or written in bold on relevant sessions in WGI TS or report. Each sentence in this part is not well linked to other sentences. Please revised these part to make sense or clear.. [Government of Republic of Korea]	accepted, text revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	29	7	25	These paragraphs could be introduced as the 3rd, 4rd, 5th, 6th, 7th, 8th, 9th, respectively [Maria Carmen Llasat, Barcelona]	statement not clear - no action taken
SPM	5	29	10	17	SPM-section1: The first section, 1.Observed Changes, is not well mixed of observations and forcing drivers of climate changes due to lack of good linkages between contents over all. In addition, this section has too much information as having a string of pictures without comprehensiveness and understandings. Please revise this section even with fewer pictures with clearer supplementary explanation. [Government of Republic of Korea]	accepted, Structure revised
SPM	5	30	5	30	The time span of 'over decades to millennia' in the heading is not very clear without reading the elaboration below. It would be good to specify it directly in the heading. [Government of Switzerland]	rejected, this is a headline statement with specific examples in following text
SPM	5	30	5	30	Use of the word unprecedented, even with qualification, implies unprecedented over all time. [Government of United States of America]	rejected, as qualification clarifies that it is decades to millennia, not minus infinity
SPM	5	30	5	31	text does not correspond entirely with figure [Government of Sweden]	Text revised
SPM	5	30	5	31	This sentence does not include the reference to the increased concentrations of greenhouse gases, which is referred in the original sentence in the WG1 report (page 4, chapter B). we suggest that this observed change should be included in this sentence of the SYR body and SPM as well. [Government of Netherlands]	rejected, text on drivers follows further down
SPM	5	30	5	31	Please complete the legend for the used colours. [Government of Germany]	rejected, detailed colourcode for some panels is given in crossreferenced material for brevity
SPM	5	30	5	31	The sentence before the reference to figure SPM.1 speaks about temperature, ice and snow extend and SLR, but the figure itself doesn't include any graphic on ice and snow [Government of Spain]	accepted, reference changed
SPM	5	32	5	32	The SYR SPM cannot repeat all the information in WG SPMs. Here, a single number to represent observed global warming could be presented. Presenting two numbers leaves readers wondering which number to use and what the significance of the different approaches is. Keeping both numbers would require that text providing context would need to be added (i.e. text to explain that different methods exist for describing the amount of warming that has occurred globally since direct observations began and that these can yield slightly different results, although all confirm that substantial warming has occurred). [Government of Canada]	accepted, only one period now given
SPM	5	32	5	35	It looks as though the confidence intervals are not symmetric around the true estimate or is it because of rounding errors. If so, this should be mentioned in the footnote. [Government of South Africa]	rejected, as details given in underlying reports
SPM	5	32	5	37	Reduce technical details such as Calculated by a liner trend,multiple data sets (this is in the underlying reports) [Government of Ireland]	rejected, this is needed for clarity

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	32	5	37	I could impaging that the first statement (l32-35) is a lot more certain than the second (l35-37); if so, perhaps it would be good to split the assessment of certainty between these two statements - in my view if the first message is strong, it would not be good to downplay it by lumping the confidence statement with a "medium" confidence which perhaps only refers to the second part. [Helmut Haberl, Austria]	bullet has been revised to clarify
SPM	5	33	5	34	I feel the sentence could be rewritten - the clause "when multiple independently produced datasets exist" sounds like a clause that this is the warming only when these independent data sets exist. Perhaps turn around and say "For the time period 1880-2012, which is a period for which multiple independently produced datasets exist, the globally averaged ..." [Keith Shine, United Kingdom]	Accepted. Sentence rewritten.
SPM	5	33	5	35	Explanation of the square brackets should be marked at line 33 already to make it clear. [Government of Hungary]	Accepted.
SPM	5	33	5	35	The footnote 1 should appear at the first occurrence of a range in square brackets, ie at line 33, instead of 35. [Government of France]	Accepted.
SPM	5	34	5	34	I am not sure what useful extra information this second sentence brings that isnt essentially in the first sentence. It seems like an elaboration at a level that isnt required in the SYR. [Keith Shine, United Kingdom]	Accepted. Second sentence deleted.
SPM	5	34	5	35	The average of the 1850-1990 is compared with the average of 2003-2012. The large difference in the length of the periods could lead to biased comparison. Why not compare the average of the last 30 years (say 1983-2012) or 50 years with the 1850-1900 period? [Government of Switzerland]	Taken into account. Sentence deleted to avoid confusion.
SPM	5	34	5	35	I realize that the WG1 SPM included both these numbers. But it did not do so in this manner - instead it had separate sub-bullets. I would suggest that in the version submitted you use just one of these two sets of numbers and that you have the inclusion of the second in addition as a fall back. Using both sets of numbers serves to obfuscate rather than clarify at this level. The key point is that it is warming and that this warming is larger than recognized uncertainties. I don't think this needs saying two different ways at the SYR SPM level of detail. [Peter Thorne, Norway]	Accepted. Second sentence deleted.
SPM	5	35	5	35	regarding the foot note: it is adviced to use the confidence interval instead of uncertainty interval. This is to be consistent with other clarifications in the report. [Nedal Katbeh-Bader, Other - Palestine]	Taken into account. Footnote simplified so that the issue no longer arises.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	35	5	35	Please move footnote 1 to after the brackets on line 33, and add an additional footnote after "... available" on line 35: To ensure consistency with the WGI SPM please consider to include footnote text like e.g.: "Both methods used to estimate the temperature increase presented in this paragraph were also used in AR4. The first calculates the difference using a best fit linear trend of all points between 1880 and 2012. The second calculates the difference between averages for the two periods 1850–1900 and 2003–2012. Therefore, the resulting values and their 90% uncertainty intervals are not directly comparable.". [Government of Norway]	Taken into account. First point accepted; second point has become moot because sentence was deleted.
SPM	5	35	5	36	In the second sentence, there is need also to indicate how the ocean has behaved during the last three decades considered but if the phrase "Earth's Surface" includes both land surface and ocean, then after the phrase there is need to insert "land surface and ocean" in brackets for clarity [Government of Kenya]	Rejected. Verbatim from WGI SPM.
SPM	5	35		37	RETAIN: "The total increase between the average of the 1850-1900 period and the 2003-2012 period is 0.78 [0.72 to 0.85] °C, based on the single longest dataset available. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983–2012 was likely the warmest 30-year period of the last 1400 years." [Peter Carter, Canada]	Noted.
SPM	5	35			The footnote should come earlier, in line 33 with the first appearance. [Government of Germany]	Accepted.
SPM	5	36	5	36	The missing information is about the Southern Hemisphere without no explanation on why this is not describe in the report. A quotation will be important on why was only developed the Northern. [Government of Venezuela]	Accepted. Note added that this assessment is possible only for NH.
SPM	5	36	5	37	This result is focus on Norther Henmisphere. I suggest include an explanation of why a reference to Souther Hemisphere is not included. If it is not possible I suggest delete the statement. [Carlos Méndez, Venezuela]	Accepted. Note added that this assessment is possible only for NH.
SPM	5	36	5	37	Part of the sentence present in page 386 of the Executive Summary of chapter 5 of WG I Report is not present in this sentence of the SYR. we think it is important to be included, especially because it has a higher confidence than the one being stated in this sentence of the SYR. So we suggest that the missing part, which is "was very likely the warmest 30-year period of the last 800 years (high confidence)", is included between "period 1983-2012" and "and likely the warmest ...". [Government of Netherlands]	Rejected. Verbatim from WGI SPM.
SPM	5	36	5	37	Second sentence. Despite limited long-term data observations, temperatures have also increased in the Southern Hemisphere. There is therefore need to mention the same for the Southern Hemisphere instead of the Northern Hemisphere only. [Government of Kenya]	Taken into account. Note added that this assessment is possible only for NH.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	36	5	38	Suggest deleting this sentence. It really adds nothing to the sentence before it so it is redundant. Additionally, it looks weak to lead with a "medium confidence" finding. [Government of United States of America]	Rejected. Verbatim from WGI SPM. Extends assessment of current warmths over a period ten times longer.
SPM	5	37	5	37	"Likely" there should be a box at the beginning of the SPM with the explanation of the uncertainties. Bring from page 30 this information to the beginning of the report. [Government of Venezuela]	Taken into account.
SPM	5	37		37	Insert [The period from] 1983-2013... This will improve clarity. [Government of Ireland]	Rejected. Verbatim from WGI SPM.
SPM	5	37			Please add a footnote referring to the explanation of the uncertainty language used in AR5, and refer to the Box later in the SYR. [Government of Germany]	accepted
SPM	5	38	5	38	{1.2} could be refined to 1.2.1 [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.
SPM	5	38	5	38	We think a sentence on differences in observed warming would be merited and suggest to add: "Average observed warming over land is about double compared to warming over the oceans, and is substantially larger in high latitudes than in the tropics. (Figure SPM.1)" [Government of Netherlands]	Rejected. The amount of detail that can be provided is extremely limited.
SPM	5	38	5	38	Please consider adding: In most land areas, but especially in Arctic regions warming has been observed to exceed the global averaged surface warming. Especially, reconstructions and simulations reveal Arctic and Antarctic surface air temperature amplification of up to two times the global mean. {WGI Box 5.1, Figure 1c,d}. An alternative could be to include the finding from WGI SPM, "Multiple lines of evidence support very substantial Arctic warming since the mid-20th century. {WGI SPM B.3} [Government of Norway]	Rejected. The amount of detail that can be provided is extremely limited.
SPM	5	38			• SPM [P5 L38] Insert 'However, the rate of warming over the past 15 years (1998–2012; 0.05 [–0.05 to 0.15] °C per decade), which begins with a strong El Niño, is smaller than the rate calculated since 1951 (1951–2012; 0.12 [0.08 to 0.14] °C per decade) from WGI SPM [Government of Saudi Arabia]	Taken into account. Sentences inserted.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5	38		<p>Please show the absolute Global mean surface temperature and the 2 components: The absolute global mean surface air temperature over land and of the surface of the ocean. Please show how these have change for the period in the observations and will do so in the models. Base data is important so people can appreciate the magnitude of historic and future change. Global mean surface temperature: http://climexp.knmi.nl/atlas/series/CMIP5one/eps_transparency/world/time_tas_world_mon1_ave12_ref0-0_1880-2100_CMIP5one_rcp26_rcp45_rcp60_rcp85.png Land mean surface air: http://climexp.knmi.nl/atlas/series/CMIP5one/eps_transparency/worldland/time_tas_worldland_mon1_ave12_ref0-0_1880-2100_CMIP5one_rcp26_rcp45_rcp60_rcp85.png Ocean mean surface: http://climexp.knmi.nl/atlas/series/CMIP5one/eps_transparency/worldsea/time_tas_worldsea_mon1_ave12_ref0-0_1880-2100_CMIP5one_rcp26_rcp45_rcp60_rcp85.png The temperatures are combined at ratios 71% Ocean surface and 29% land surface air to get the global warming number. The ocean covers 71% of the planet while the land covers 29%. This simple explanation would clarify what global average surface warming means as there us enormous confusion - even among policy makers. Colour coded maps showing the change are not sufficient as they are highly abstract. Very littly point having a SYR summary about climate change if most people don't know the basics about the number. Infact I do not think it is simply explained in any IPCC report of the 21st Century. [Michael Casey, Ireland]</p>	Rejected. The amount of detail that can be provided is extremely limited.
SPM	5	38		<p>The speed of this observed global average warming since 1850 was at more than ten times faster than the fastest periods of global average temperature change during the emergence from the last ice age. [Michael Casey, Ireland]</p>	Noted.
SPM	5		27	<p>A clear definition of pre-industrial is needed because currently there are many different references. WGI defines pre-industrial as 280 ppm CO2 {WGI TS 5.7.2}}. This level corresponds to approximately 1850. We suggest to use that year's temperature as the proxi for pre-industrial throughout the SyR. [Government of Netherlands]</p>	Taken into account,definition of preindustrial see glossary.
SPM	5		27	<p>All paragraphs with the boldface should be provided as the reliability/uncertainty such as "likelihood" series and "confidence" series. [Zong-Ci Zhao, China]</p>	Taken into account. Calibrated language is used where appropriate; however, some statements are statement sof facts.
SPM	5		27	<p>Attending the scope of the SPM and the public to which it is addressed, some formal changes could be done to better organise the conclusions and to facilitate its comprehension. I include my proposals in the following comments: [Maria Carmen Llasat, Barcelona]</p>	Noted.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5		27		In spite the low agreement about future impacts of climate change on precipitation and heavy precipitation at regional scale, the SPM should include a specific paragraph with the main conclusionson this issue and their degree of uncertainty, agreement or confidence. [Maria Carmen Llasat, Barcelona]	Noted. For Section 2; where it is now included
SPM	5		27		The numbering of sections of the SPM and the extended report can lead to confusion. There are two sections 1, 2, etc. Could roman numbers or something different be used for the SPM? [European Union]	rejected, crossreferencing is always to extended report, so not much danger of confusion
SPM	5				• SPM [P5] of SYR does not include 'evaluation of climate models' as appeared in SPM of WG1 Section D.1 'The long-term climate model simulations show a trend in global-mean surface temperature from 1951 to 2012 that agrees with the observed trend (very high confidence). There are, however, differences between simulated and observed trends over periods as short as 10 to 15 years (e.g., 1998 to 2012)' [17 years to 2014] [Government of Saudi Arabia]	Rejected. The amount of detail that can be provided is extremely limited. However, recent trends are now mentioned.
SPM	5				ADD to SPM INTRO: The SYR, at the very end (p. 118, line 1-12), has a section entitled "Box: Information relevant to Article 2 of the UNFCCC." ADD to SYR SPM, to inform policy, the UNFCCC information as on p. 118, line 1-12: "Box: Information relevant to Article 2 of the UNFCCC Article 2 states the objective of the Convention: « stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (...) within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner ». At their 16th Conference, in Cancun (2010), the Parties to the UNFCCC agreed that "deep cuts in global greenhouse gas emissions are required... with a view to reducing global greenhouse gas emissions, so as to hold the increase in global average temperature below 2°C above pre-industrial levels" (decision 1/CP.16). They also agreed to review this long-term global target on the basis of the best available scientific knowledge with a view to possibly strengthening the target to 1.5°C. Nonetheless, global GHG emissions continue to grow at an increasing rate...." This is most policy-relevant for inclusion in the SPM Introduction. [Peter Carter, Canada]	We choose to only include an introduction to the topics, the WG reports and uncertainty language.
SPM	5				ADD to SPM INTRO: 2°C and 1.5°C are equilibrium warming policy targets. Warming by 2100 is only the realized "transient" warming, which is considerably less than the eventual full "equilibrium" warming. This is most policy-relevant for inclusion in the SYR SPM Introduction. [Peter Carter, Canada]	We choose to only include an introduction to the topics, the WG reports and uncertainty language.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	5				ADD to SPM INTRO: The 2009 U.S. Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act found that "the current and projected concentrations of carbon dioxide, methane and nitrous oxide in the atmosphere threaten the public health and welfare of current and future generations" and that combined emissions of greenhouse gases come fossil fuel combustion "contribute to the greenhouse gas pollution, which threatens public health and welfare. This is most policy-relevant for inclusion in the SYR SPM Introduction. [Peter Carter, Canada]	We choose to only include an introduction to the topics, the WG reports and uncertainty language.
SPM	5				EXPLAIN in the SPM Introduction that risk of impact is defined as "the event's probability multiplied by the value magnitude of the harm that will result from it" (from p. 30, line 9). ALSO ADD: "Both risk and uncertainty may be understood qualitatively or quantitatively" (p. 30, line 5-6). In the SPM Introduction, INCLUDE "Uncertainty can result from a lack of information or from disagreement about what is known" (p. 29, line 40-41). Use probability percentages as well as text for all projections. As written in the SYR SPM, neither mitigation nor adaptation can be expected to prevent global and planetary climate change catastrophes affecting all regions and populations. [Peter Carter, Canada]	We choose to only include an introduction to the topics, the WG reports and uncertainty language.
SPM	5				• SPM [P5] of SYR shall include reference/information on uncertainties. [Government of Saudi Arabia]	Taken into account. Calibrated language is used where appropriate; however, some statements are statement sof facts.
SPM	6	0	6	0	Figure SPM.1 All three panels lack a (clear) legend. For the top panel it is unclear that the temperature anomaly is shown relative to 1961-1990. The y-axis labels are inconsistent with Figure 1.1. Furthermore, a change compared to what? State the baseline. Also for the middle graph it is unclear for the y-axis label that the graph show sea level change as it is not indicated on the axis. Furthermore, the unit remain negative until ca. 2000, indicating sea level decline? When comparing with Figure 1.1, units and values don't match. For the bottom graph, the caption could be improved, for example by a semicolon between "... greenhouse gases" and "carbon dioxide". The written legend is not clear for methane and N2O - alternate: " for three greenhouse gases, carbon dioxide (green), methane (orange) and Nitrous Oxide (red) determined from ice core data (dots) and atmospheric data (solid line)". please include the information related to GHG to the sentence and add one related to the decrease of snow and ice amounts. [Government of Netherlands]	Taken into account. Caption has been completely re-written.
SPM	6	0			Figure SPM 1 : Are Methane and nitrous oxide also determined from ice core (dots) and atmospheric measurements (solid lines)? Should be specified in the caption. [Thomas Stocker/ WGI TSU, Switzerland]	accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	1	6	1	Figure SPM.1. Compared to the Figure 1.1, graph showing GMSL change (middle in the Figure SPM.1) is drawn in different colors and uses different reference year (year whose GMSL is set to zero). Also, compared to the Figure 1.1, graph showing observed annually and globally averaged combined land and ocean surface temperature anomalies (top in the Figure SPM.1) uses different reference year and does not show the values of several recent years, which are shown in the Figure 1.1. In order to find the corresponding figure easily, we would like to suggest using same figure as used in the Figure 1.1. If present configurations are preferred, label of y-axis would be "Temperature anomaly relative to 1986-2005" and "Global Mean Sea Level relative to 1986-2005" for top and middle panel, respectively. [Government of Japan]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	In Figure SPM.1, reference years must be indicated for top and middle figures. [Toshihiko Takemura, Japan]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	This figure caption should indicate the baseline period (year sequence) for which the variable differentials are referenced. [Government of United States of America]	Taken into account. Caption has been rewritten
SPM	6	1	6	1	This figure appears very blurry when viewed in Adobe PDF viewer. There is also no explanation in the caption of what each line in the middle figure represents in terms of datasets. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	Fig. SPM.1, p 6: Colors and legends not uniform and not labeled clearly. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	Fig SPM.1: The figure caption needs to specify what datasets are used for the top and middle panels, while also noting what year the plots are normalized to and why. Also, are the CH4 and N2O trendlines in the bottom panel from direct obs only? Or ice cores, as well, like CO2? This needs to be clarified. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	Since the ocean is key in storing so much of the GHG warming, the time series of upper ocean heat content change (Figure 1 upper right panel, p. SYR-31) should be included in Figure SPM.1. This record also is key in explaining the consistent warming trend in recent decades, which is partially covered by natural variability in global surface temperature records. [Government of United States of America]	Taken into account. While the amount of detail provided in the SPM must be extremely limited, Topic 1 brings out ocean heating much more clearly now in text.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	1	6	1	Figure 1 is poorly conceived, especially considering that this is the first figure the reader will see. It is very unclear. On the top graph, it makes no sense from a communications perspective to start with negative temperatures. This will be confusing to the reader. It is not clear that the middle graph refers to sea level raise. Also, it doesn't make sense to start with a negative level of sea level rise. Generally, the production of this figure needs to be much improved - the explanation below, the legend, and the quality of the graphs all need to be improved. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	How is the reference point for the temperature chart chosen? By using ~2000 as the reference year, it gives the impression that that is "normal" and it was unusually cool previously. If it is an option, it would be better to reference to preindustrial or other past point temperature, so that the current temp shows accurately as a change from that. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	In Fig. SPM.1 what data sets are used for globally averaged temperature, GMSL, and CO2? [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	Figure SPM.1: Provide the missing error bars in the plots. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	The authors should spell out GMSL for vertical axis. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	1	The two top panels which are anomalies should have the climatology period added to the y-axis - so Temperature (C) relative to 1985-2005 or similar otherwise it is unclear as things stand what the reference period is. Having on the axes labels would be marginally preferable to in the caption but it needs one or the other. [Peter Thorne, Norway]	Taken into account. Caption has been completely re-written.
SPM	6	1	6	5	Please expand the caption for Figure SPM-1 to explain the multiple lines plotted on the top two figures, and the shading on the GMSL figure [David Wratt, New Zealand]	Taken into account. Caption has been completely re-written.
SPM	6	1	15	57	Since in Figure SPM6 a baseline of 1986 to 2005 is used and then suddenly in section 3 the statements use a preindustrial baseline (and it is a good statement so suggest to leave it that way) we need a footnote somewhere to relate the difference between the two baselines. [Rachel Warren, United Kingdom]	Figures are based on approved Figures
SPM	6	1			Figure SPM 1. Suggest inclusion of the decadal global temperature anomalies as presented in Figure 1,1 SYR pp31, as these are alluded to in the text. [Government of Ireland]	Rejected. Space limitations prevent inclusion of a figure on every item covered in the text.
SPM	6	1			Caption: suggest to insert [Selected] or [Sample] observed indicators.... [Government of Ireland]	Taken into account. Caption has been completely re-written.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	1			Figure SPM.1 is not entirely clear and should be improved: The labing of the axes should be clear for lay persons. For clarification we propose a short heading in each graph (e. g. "Annual average" for the graph on the top, compare WG1 Fig SPM.1). Please explain the applied colours for all graphs and add the information about the timescale and period of reference. [Government of Germany]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	2	Change "observed" to "Observed" [Government of Japan]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	2	Figure SPM.1. Considering the significance of ocean acidification impacts on coral reefs and marine species, ask that WG1 Figure SPM.4(b) be added to SYR Figure SPM.1. Major finding of AR5 and critical information for policy makers. [Government of Japan]	Rejected. Space limitations prevent inclusion of a figure on every item covered in the text.
SPM	6	2	6	2	There are multiple unexplained curves on the top two plots. [Keith Shine, United Kingdom]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	2	Change "observed" to "Observed". [Toshihiko Takemura, Japan]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	2	Fig SPM.1: it would be useful to also show the upper ocean warming that has not "paused" and that is referred to in the paragraph after the figure [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Taken into account. While the amount of detail provided in the SPM must be extremely limited, Topic 1 brings out ocean heating more clearly now.
SPM	6	2	6	2	For an SPM of the sythesis report it would be better to show absolute temeprature rather than anaomalies as it is easier to explain to policy makers and the public who do not understand anomalies and why we use them. It there is some reason to use anomalies (e.g. bias correction), why not have it relative to the 1850 to 1900 mean as you use in the text so the less educated reader (and these days many non-scientsits look at IPCC reports) do not wonder why change is near zero near the current date. I have had these comment more than once from various audiences when showing IPCC figures. Furthermore, it is it is not even stated to what year or period the anomaly is referenced. An anomaly is also used in fig 1.1 page SYR31 for both surface temerature and sealevel rise but clearly referenced to a different period which is at least stated in that figure for temerature (1961 to 1990), and seems to be for 1900 for sea level. In fig SPM 5 the temeptrautre anomaly is realitve to 1861-1880, pre-industrial. At a minimum use difference language than anomlaies e.g. temerature change compared to the avergae temperuature during xxxx-yyyy). For the second panel (sea level) the caption does not even state that this is an anomalie. In both the temrature and sea level panels there are different colour lines but it is not stated that these are different data sets. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Taken into account. Caption has been completely re-written. Anomaly is shown for temperature because it is the quantity that is primarily assessed in WGI, for reasons explained there..

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	2	6	3	Figure SPM.1. It would be noted that each colored line and mark indicate different data sets in all panels, and uncertainties are shown by shadings in the middle panel. [Government of Japan]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	3	Regarding the caption for Figure SPM.1: Used "Top)", "middle)", and "bottom)" to address three panels -> should be consistent. [Government of United States of America]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	5	The datasets should be referred to. We suggest to use the approach applied in the WGI AR5 and use the sentence from Figure 1.1: "For full technical information, and details on the datasets shown, refer to the underlying WGI Summary for Policymakers and Chapter figures, and the supplementary material to the Technical Summary." Need to decide if direct references to Chapter figures from the underlying reports can be included in the SYR SPM or if the reference will need to be to the relevant Section in the SYR topics. [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.
SPM	6	2	6	5	Figure SPM.1: Please explain all the colours. For the temperature and sea level graphs, please provide the corresponding reference periods as anomalies/changes are depicted. [Government of Sweden]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	5	I miss description/legend for top and middle figures. Additionally, the description of the bottom figure is too short compared to the description of the original figure 1.1. For example, write green dots versus blue line, not only the colors. [Government of Sweden]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	5	Include an explanation in the caption of this Figure about the meaning of the y-axis of the top and middle graphs, i.e., what is it associated to "0" and/or give the time period the anomalies are relative to? [Government of Netherlands]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	5	We think the word "anomaly" is scientific jargon that should be avoided in the SYR. It is inconsistent to write "carbon dioxide" without and "Nitrous Oxide" with capitals. Missing from the explanation is that the lines are direct measurements, while the dots are paleodata from ice cores. It is inconsistent to use an other color for direct measurements (blue) in CO2, but not in methane and nitrous oxide, and we prefer to use Figure 1.1 left column, middle panel without amendments or use the same color for dots and lines of each gas. We suggest to rephrase the caption to: "Figure SPM.1.: Indicators of a changing global climate. Top) Globally averaged combined land and ocean surface temperatures relative to 1961-1990. Middle) Global mean sea level relative to 2000. Bottom) Concentrations of major greenhouse gases in the atmosphere, CO2 in green, CH4 in orange, N2O in red. Dots are values from ice cores, lines are direct measurements. {Figure 1.1}" [Government of Netherlands]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	5	The figure caption does not explain the figures properly. Please check. [Government of Netherlands]	Taken into account. Caption has been completely re-written.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	2	6	5	Figure SPM.1. First panel: It is essential to state clearly the reference period for the temperature anomaly. The colours in the first two panels are not described; suggest to make a reference to the underlying report, as was done for WGI Figure SPM.1. Second panel: spell out the annotation GMSL. For the bottom panel, only half the panel is described, suggest to reword: "atmospheric concentrations of CO2 (green), CH4 (orange), N2O (red) determined from ice core data (dots) and from direct measurements (solid line). Suggest to use colours more friendly for colour blindness (red-green colour blindness is quite frequent). It's difficult to skim through the caption and identify where the description of each panel begins; suggest to use full stop where one description ends, and begin the annotations Middle and Bottom with capitals. [Government of Denmark]	Caption has been revised
SPM	6	2	6	5	add time period, the temperature anomalies are referenced. Redraw the GMSL data so that the three time series are not interrupted by the shaded uncertainty, explain GMSL and add time period the data are referenced. Wouldn't it be better to take the respective figure from SPM WG1 for GMSL and temperature that is also used in the SYR on page 31, Fig. 1.1) The WG1 GMSL and temperature record are referenced differently than shown here. Insert CH4 in line 5 as well as N2O. The direct atmospheric measurements are shown as a thin line, suggest to make them bolder, explain abbreviations ppm and ppb [Monika Rhein, Germany]	Figure and Caption has been revised
SPM	6	2	6	5	The description of these figures is rather confusing. 1) The colours mean in the top and middle charts are not explained, and in the third chart, only green and blue are specifically mentioned. Please explain the applied colours for all graphs. Rephrase the descriptions of the bottom chart to make it clearer. Please add the information about the timescale and period of reference. 2) The system of description of the various charts is confusing. Specifically: "Top)... middle)... bottom:" Consider a different way of identifying each of these charts to make it clearer to the readers. A short heading for each graph could be helpful. The caption of the bottom picture would be easier and quicker to understand, if the explanation explicitly included the words "yellow" (in parenthesis following "methane") and "red" (in parenthesis following "Nitrous Oxide"); an indication how the concentrations of these two components (CH4 and N2O) were determined would also be desirable. The label "GMSL" of the middle graph's x-axis should be spelled out for non-experts. [Government of Germany]	Caption has been revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	2	6	5	An end year is needed for the x-axis. The caption is incomplete (the description of some colours are missing). However, this figure puts together drivers (atmospheric GHG concentrations) and effects (temperature and sea-level), while the caption talks of "observed indicators of a changing global climate" (GHG increase can be misinterpreted as a consequence of warming, and not as the cause of it). If the link between drivers and effects is done here, then the chapter should be deeply modified, bringing upfront the considerations on the drivers made at the end of the chapter (page 9-10). [European Union]	Taken into account. Caption has been completely re-written.
SPM	6	2	6	6	Figure and caption need to be clearer [Government of Ireland]	Caption has been revised
SPM	6	2	6	9	Amend text to read "... methane (orange dots, red line) and nitrous oxide (red dots, pink line)". Why do the CO2 data not start in 1959? (The Mauna Loa observations began then). [European Union]	Noted. For consistency reasons, the records for CO2, CH4 and N2O are all taken from the same location, Cape Grim. The CO2 record is thus not the Mauna Loa record, despite the fact that it would be the longest continuous record of atmospheric CO2 concentrations.
SPM	6	2			Figure SPM 1: The caption of this figure is incomplete. Please add : - a key to the different colours in the two upper panels - an explanation that the dots in the bottom panel are derived from ice core data and the line represent direct measurements (this is currently given only for CO2) - an explanation for the colours used for methane and nitrous oxide [Government of Belgium]	caption has been revised
SPM	6	3	6	3	Figure SPM.1. To be consistent, "," should be replaced with ";" just before "middle", and "." with ")" after "bottom". [Government of Japan]	caption has been revised
SPM	6	3	6	3	Please add "(GMSL)" after "global sea level change". [Government of Norway]	caption has been revised
SPM	6	3	6	3	In caption to Fig SPM-1, Term 'temperature anomalies' needs a definition (perhaps in foot note). [Tony Weir, Australia]	Caption has been revised
SPM	6	3	6	3	Write "bottom)" [Government of Switzerland]	Caption has been revised
SPM	6	3	6	3	"anomalies, middle) global" should be "anomalies; middle) Global" and "bottom:" should be "bottom)" instead [Government of Vietnam]	caption has been revised
SPM	6	3		5	Figure spm1, bottom panel, orange and red lines not defined. I presume Nitrous Oxide is FROM Fig1.1. ADD where the data comes from (a link). Consider adding a 4th panel with (inverted) ice extent [bottom: Atmospheric 3 concentrations of greenhouse gases carbon dioxide (CO2) determined from ice core data (green) and from direct 4 atmospheric measurements (blue); methane and Nitrous Oxide (Figure 1.1)] [Alessandra Conversi, United Kingdom]	caption has been revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	4	6	4	Legend to the Figure SPM.1. In this part of the sentence "atmospheric measurements (blue); methane and Nitrous Oxide", please include the colours of the points and lines after: methane (orange) and Nitrous Oxide (red). [Government of Argentina]	Caption has been revised
SPM	6	4	6	5	The figure caption says: "carbon dioxide (CO2) determined from ice core data (green) and from direct 4 atmospheric measurements (blue); methane and Nitrous Oxide (Figure 1.1)" It is not clear if methane and Nitrous Oxide are also obtained from ice core data and atmospheric measurements too. [Government of Argentina]	Caption has been revised
SPM	6	4	6	5	inconsistent with what is given in the bottom panel of Figure SPM.1 [Government of Russian Federation]	Caption has been revised
SPM	6	5	6	5	"Figure 1.1" should be written between braces {} because it refers to something outside the SYR SPM [Thomas Stocker/ WGI TSU, Switzerland]	Caption has been revised
SPM	6	5	6	5	The phrase "methane and Nitrous Oxide" should be consistent to other part of the caption and color of the data should be described. In addition, it would be noted that ice core data and direct atmospheric measurement are plotted with dots and line, respectively. For example, "... from ice core data (green dots) and .. measurements (blue line), ... methane (CH4, yellow dots, orange line) and nitrous oxide (N2O, red dots, purple line)" [Government of Japan]	Caption has been revised
SPM	6	5	6	5	methane change to "Same pattern of the Methane..."! [Hui JU, China]	caption has been revised
SPM	6	5	6	5	Change "Nitrous Oxide" to "nitrous oxide". [Toshihiko Takemura, Japan]	Caption has been revised
SPM	6	5	6	5	In caption to Fig SPM-1, " (blue line)" would be clearer than plain "(blue)". (I had to search hard to find anything blue in the chart!) [Tony Weir, Australia]	Caption has been revised
SPM	6	7	6	7	IT would be good if this SPM includes a figure demonstrating the increase in heat capacity of the earth system. This can be derived from WGI figure from Box 13.1 Chapter 13. The reason is the robust and integral information of this figure, which addresses not only global warming, but also attribution, robustness of the warming and insight of the composition of the climate system. This is what a synthesis should contain. [Government of Netherlands]	rejected for SPM, but such a figure is now in the extended report, topic 1
SPM	6	7	6	7	It would be helpful to include an introductory sentence at the beginning of many paragraphs and to present material in the paragraphs that directly follow a bolded statement that clear support the bolded statement. This paragraph could include an introductory sentence clarifying that the previous paragraph described warming at the surface of the Earth, while here evidence is presented to show that warming has penetrated below the surface as well. For example, a simple sentence could be introduced as follows: "Warming has also penetrated below the Earth's surface, on land and in the oceans. Warming vast quantities of water in the oceans requires a lot of heat; therefore, ocean warming....etc.". [Government of Canada]	Text revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	7	6	7	It would be better language to reverse this sentence - the key point here for policy is not the ocean warming is dominant but that most of the energy has gone into the oceans (therefore we shouldn't be deceived by the relatively small temperature change). so I suggest starting the sentence with "Most of the additional energy that has accumulated has been absorbed by the oceans; ..." [Government of United Kingdom of Great Britain & Northern Ireland]	rejected, approved text from WGI used
SPM	6	7	6	7	"Ocean warming" should be replaced by "increase in ocean heat storage" dominates the increase in energy... the warming is a consequence. This sentence should be modified to avoid confusion in the physics. [Government of France]	rejected, does not communicate
SPM	6	7	6	8	We think the information presented here is extremely relevant when considering the development of the temperature of the atmosphere since 1998, but this is not made explicit. This is an example of synthesis that is still lacking in the draft. Also, this sentence is unnecessarily complicated. We suggest to rephrase to: "Between 1979 and 2010 the ocean absorbed roughly 93% of the energy stored in the climate system, while melting ice and the continents each took up 3%, leaving the atmosphere responsible for only 1% (Figure SPM.1bis). Small changes in the ocean uptake have large impacts on the atmosphere, but the deep ocean is too poorly monitored to provide an explanation for the atmospheric temperature pause with confidence." and insert WGI Box 3.1 Figure 1. Suggested caption text: "Figure 1bis: Energy accumulation in ZJ (1 ZJ = 1021 J) between 1971 and 2010. Upper ocean (light blue, above 700 m), deep ocean (dark blue, below 700 m, below 2000 m from 1992), ice melt (light grey; for glaciers and ice caps, Greenland and Antarctica from 1992, and Arctic sea ice from 1979), continental (land) warming (orange), and atmospheric warming (purple; from 1979). Dot-dashed lines indicate 90% confidence intervals for all components." [Government of Netherlands]	the finding that is verbatim from WGI report is unaltered. However, period following 1998 now discussed explicitly in SPM. Figure revised
SPM	6	7	6	8	"Ocean warming dominates the increase in energy stored in the climate system..." perhaps for lay person difficult to understand. Readers with knowledge of the subject will understand what is meant, but to make this text more accessible to broader audiences, a further explanation would be helpful. [Government of Germany]	rejected, conservation of energy is relatively widely understood
SPM	6	7	6	9	This paragraph leaves open the question of what we can say about ocean heat content at depths greater than 700 m. [Government of United States of America]	rejected, see technical reports
SPM	6	7	6	10	Please consider including information of how much the ocean has warmed during the 1971-2010 period. [Government of Norway]	rejected, too much detail
SPM	6	7	6	14	Shorten and reduce technical details such as mention of evaporation [Government of Ireland]	rejected, term is needed on physical grounds

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	7	6	14	It makes no sense the word "virtually" in the phrase of global ocean [Government of Ecuador]	rejected, consistent with WGI report
SPM	6	7	6	14	Please consider switching the order of these sentences so that that paragraph as a whole deals first with the more "physical" parameters, and ends with the statement regarding oceanic uptake of anthropogenic CO2 that results in acidification. [Government of Norway]	text revised
SPM	6	7	6	14	Please consider also mentioning deoxygenation, for example: Since 1960 oxygen concentrations have decreased in the open ocean thermocline in many ocean regions (medium confidence), and it is likely that tropical oxygen minimum zones have expanded in recent decades. [Government of Norway]	considered, but not rejected due to space limitations and limitation in confidence
SPM	6	7	7	29	SPM-section1: The first section, 1.Observed Changes, is strongly recommended to be matched with the context of the Topic 1 and shall be better have more subsections as most contents are, at the moment, is not well mixed of observations and forcing drivers of climate changes due to lack of good linkages between contents over all. In addition, this section has too much information as a string of pictures without comprehensiveness and understandings. Please revise this section even with fewer pictures with clearer supplementary explanation. [Government of Republic of Korea]	text and structurerevised
SPM	6	7		8	RETAIN: "Ocean warming dominates the increase in heat and energy stored in the climate system, accounting for more than 90% of the heat energy accumulated between 1971 and 2010 (high confidence)." ADD: A key result is the climate system inertia of the ocean heat lag. At present, this lag is projected by 2100 to be 75%, another 0.6°C of extra committed warming on top of today's 0.8°C surface warming. The ocean heat lag inertia will continue for centuries. [Peter Carter, Canada]	rejected, too technical
SPM	6	9	6	10	• SPM [P6 L 9-10] Add from WGI SPM 'It is about as likely as not that ocean heat content from 0–700 m increased more slowly during 2003 to 2010 than during 1993 to 2002' [Government of Saudi Arabia]	text on recent decades added to atmospheric section, but not here as too detailed
SPM	6	9	6	11	The amount of the oceanic uptake of anthropogenic CO2 seems to be important information. Therefore, we recommend to add "The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification" (WGI, SPM; p. 11). [Government of Germany]	discussed in section 1.2

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	9	6	11	These 2 sentences are too long and technical. Replace with: The oceans are absorbing carbon dioxide and are becoming more acidic. Since the beginning of the industrial era ocean acidity has increased by 26% on average (WG1 p294) and it is estimated that, by the end of this century, the average surface ocean pH could be lower than it has been for more than 50 million years. A general decrease in oceanic oxygen has been observed and is projected to decline by 3-6% by 2100 in response to warming. Relatively little is known about the impact of simultaneous changes in ocean temperature, pH and oxygen content. [Government of United Kingdom of Great Britain & Northern Ireland]	Text reworded for clarity
SPM	6	9	6	11	Changes in ocean pH don't fit perfectly with the warming trends described in this section. Wouldn't it be better placed under 'Impacts'? [European Union]	rejected, physical change
SPM	6	9	6	14	The information on these lines on ocean acidification and changes in surface salinity are confusing because it doesn't follow the storyline presented in the headline statement on page 5. Consider deleting or moving to later on (e.g. to after text on lines 21-23). [Government of Canada]	Text reworded for clarity
SPM	6	9		11	Some readers will be unaware of what a pH change means, so this section would be more useful if the characteristics of acidification were describe e.g.: 'Oceanic uptake of anthropogenic CO2 results in gradual acidification of the ocean, and in fact, there has been a small decrease of 0.1 in the pH of ocean surface water (globally??) since the beginning of the industrial era.'. [Government of United Kingdom of Great Britain & Northern Ireland]	Text reworded for clarity
SPM	6	9			At the end of the line include the fact from the SPM of WG1 "It is about as likely as not that ocean heat content from 0–700 m increased more slowly during 2003 to 2010 than during 1993 to 2002". As this lies in the confidence interval of 33-66%, we see this is a significant fact to be in the SYR. [Government of Maldives]	Too much detail here. Long term trends are most important point. Sea-level considered more important for SYR
SPM	6	10	6	10	What is gradual? This is very dependent of the time scales of the change versus natural variability. [Government of Netherlands]	We think timescale is clear from context
SPM	6	10	6	11	The phrase "The pH of ocean surface water has decreased by 0.1 since the beginning of the industrial era (high confidence)" seems to belong to WGI Section B5 (on carbon and other biochemical cycles). However, this paragraph is about section B2 (ocean). It is suggested that paragraph respects messages order as established in WG1. [Tabaré Arroyo Currás, Mexico]	Put here as direct observation
SPM	6	10	6	11	It will be more useful to specify which Ocean are we refering to (Indian, Atlantic or Pacific?). [Government of United Republic of Tanzania]	Global oceans, context should be clear

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	10			Delete the word "gradual" and replace by "rapid". The ocean is acidifying very quickly in geological and evolutionary terms. The rate of change is unprecedented. For RCP 8.5 it will be easily 50 to 80 times faster than the PETM as described by Cui et al 2011. (Cui Y, Kump L, Ridgwell A, Charles A, Junium C, Diefendorf A, Freeman K, Urban N, Harding I. 2011. "Slow release of fossil carbon during the Palaeocene–Eocene Thermal Maximum" Nature Geoscience 4, 481–485). Please consult with Barbara Hoenisch, David Archer or Andy Ridgwell for details. There is no parallel in 300m years of Earths history (Hoenisch B, Ridgwell A, Schmidt D, Thomas Ellen, Gibbs S, Sluijs A, Zeebe R, et al 2012 "The geological record of ocean acidification" Science. Ridgwell A. et al 2010 "Past constraints on the vulnerability of marine calcifiers to massive carbon dioxide release". Nature Geoscience.). [Michael Casey, Ireland]	Timescale is clear from context
SPM	6	11	6	11	The authors should convert this 0.1 pH units also to a % to give policymakers unfamiliat with pH some context. [Government of United States of America]	units dropped
SPM	6	11	6	14	Suggested to add qualifier "(medium confidence)" after "[...]providing indirect evidence for changes in evaporation and precipitation over ocean." [Tabaré Arroyo Currás, Mexico]	No confidence statement possible
SPM	6	11	6	14	Information on precipitation trends is a bit hard to interpret. Please, consider adding some regional information on changes in precipitation also over land areas. [Government of Finland]	Global water cycle is only connection possible
SPM	6	11	6	15	There is a reference to the change in precipitation to explain the changes in salinity, but precipitation are not mentioned before, nor linked to the warming. [Government of France]	precip comes into impacts section
SPM	6	11			The change in the pH of 0.1 should be complemented by the information of increase in H+ concentration given on P 32 L 52. [Government of Germany]	No longer given
SPM	6	12	6	13	The meaning of the word "dominates" in the description of precipitation and evaporation patterns in different regions of the ocean is unclear, and perhaps not scientifically accurate. Germany suggests rephrasing this sentence. The connection between salinity and relative balance of precipitation and evaporation is also not clear, especially to readers without a science background. An explanation of this mechanism should be provided. [Government of Germany]	Taken from WG1 SPM so retained
SPM	6	13	6	14	It is written : "providing indirect evidence for changes in evaporation and precipitation over ocean." But {1.2.2} says : "These regional trends in ocean salinity provide indirect evidence that evaporation and precipitation over the oceans have changed (medium confidence)" Therefore we wonder if the medium confidence statement should be added at then end of line 14 [Thomas Stocker/ WGI TSU, Switzerland]	Not with current wording
SPM	6	13	6	14	{1.2} could be refined to 1.2.2 [Thomas Stocker/ WGI TSU, Switzerland]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	13	6	14	"providing indirect evidence for changes in evaporation and precipitation over ocean." It is not an evidence for a change since with the same precipitation and evaporation it remains the same, also, possible changes in the ocean circulation should be taken into account. The last part of this paragraph should be deleted. [Government of Hungary]	Rejected taken from WG1
SPM	6	13	6	15	For these extremes WGI applies a very likely likelihood linked to human influences. Why not apply that here too? [Government of Netherlands]	Likelihoods provided where possible
SPM	6	13	6	16	Should increases in extreme precipitation be mentioned here? [Government of United States of America]	in later parts of SPM
SPM	6	14	6	14	add "medium confidence" after ... Over ocean (as in SPM WG1) [Monika Rhein, Germany]	Not needed
SPM	6	14			change "ocean" to "oceans" [Government of New Zealand]	reworded
SPM	6	14			Replace "over ocean" with "over THE ocean" [David Wratt, New Zealand]	accepted
SPM	6	15	6	15	Ice sheet loss is generalized for the Antarctic continent when this only happened in the northern Antarctic Peninsula and Amundsen Sea, but kept stable or even increased slightly for the rest of the Antarctic continent. Suggest that "northern Antarctic Peninsula" in stead of "Antarctic" here. [Government of Netherlands]	Text from WG1 SPM
SPM	6	15	6	15	Do we know (with high confidence) that Antarctica - as a whole - is losing mass (i.e., both East and West Antarctica Ice Sheets)? Do we know this with the same degree of confidence we know that Greenland Ice Sheet is losing mass? [Government of United States of America]	Over the last two decades, yes
SPM	6	15	6	17	I recommend to strengthen the sentence here on cryosphere so that the reader truly understands the scale of changes observed. It should be mentioned that the Arctic sea ice extent has been diminishing significantly faster than projected by most of the AR4 climate models (WG1. Ch1. Page 137) and the 2012 minimum sea ice extent was 49% below the 1979 to 2000 average (WG1. Ch1. Page 136). Most importantly, it should mention that the Greenland ice sheet was losing ice in average six times faster in 2002 - 2011 than just a decade before and that Antarctic ice sheet too was losing ice five times faster. (WG1. SPM. page 9) [Kaisa Kosonen, Finland]	too much detail, rejected
SPM	6	15	6	19	text does not correspond to Fig 1:1 [Government of Sweden]	Figure revised
SPM	6	15	6	19	I think, for balance, the situation with Antarctic sea-ice should be mentioned here. [Keith Shine, United Kingdom]	Dataset not as long
SPM	6	15	6	19	Why emphasize Arctic sea ice decrease while omitting Antarctic sea ice stability (or increase)? This makes it appear as if there is 'cherry picking' of the information. [Government of United States of America]	Dataset not as long
SPM	6	15			Suggest start with area of interest and end with period i.e. The greenland ... have lost mass ... over last 20 years [Government of Ireland]	WG1 spm wording used

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	16		19	RETAIN: "Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent. There is high confidence that permafrost temperatures have increased in most regions of the Northern Hemisphere since the early 1980s in response to increased air temperature and changing snow cover." ADD: These are large sources of amplifying carbon-feedback extra warming. ADD: This requires an emergency mitigation response.* [Peter Carter, Canada]	Rejected, policy prescriptive
SPM	6	17	6	17	"(see Figure 1.1)" should be written between braces {} and as line of cite at the end of the paragraph because it refers to something outside of the SPM [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
SPM	6	17	6	17	instead of writing "(high confidence) (see Figure 1.1)"; please write " (high confidence ; see Figure 1.1)." [JACQUES ANDRE NDIONE, SENEGAL]	Rejected, copyedit
SPM	6	17	6	18	'There is high confidence that...' should be deleted. Put the high confidence in bracket and place it in the end of the sentence for style consistency. [Government of Switzerland]	Rejected, from WG1 SPM
SPM	6	17	6	19	The phrase "[...] in response to increase air temperature and changing snow cover." was not found in WG1 - B3 section. Please review that such justification is accurate. Particularly as the qualifier "high confidence" seems to address the first half of the statement, but there is no certainty (based on WGI-B3 section) that it also qualifies the second part of the sentence. [Tabaré Arroyo Currás, Mexico]	In Chapter 3 of WG1
SPM	6	17	6	19	Similarly in the Second sentence. Despite limited long-term data observations, temperatures have also increased in the Southern Hemisphere. There is therefore need to mention the same for the Southern Hemisphere instead of the Northern Hemisphere only. [Government of Kenya]	Data is from NH
SPM	6	17	6	19	• SPM [P6 L17-19] Add from WGI SPM). It is very likely that the annual mean Antarctic sea ice extent increased at a rate in the range of 1.2 to 1.8% per decade (range of 0.13 to 0.20 million km2 per decade) between 1979 and 2012 [Government of Saudi Arabia]	Timeseries in Figure 1.1 and shorter so not discussed here
SPM	6	17			Move the reference to Figure 1.1 into the curly brackets at the end of the paragraph. [Government of New Zealand]	Accepted
SPM	6	17			Please add a sentence on the rate of ice loss e.g. from WGI SPM: "The average rate of ice loss from the Greenland ice sheet has very likely substantially increased from 34 [-6 to 74] Gt yr ⁻¹ over the period 1992 to 2001 to 215 [157 to 274] Gt yr ⁻¹ over the period 2002 to 2011. {4.4}". Or, that the rate of loss has six-folded over the period 2002-2011 compared to the period 1992-2001. [Government of Norway]	Too detailed
SPM	6	17			• SPM [P6 L17] Correct as Figure 1.1 does not exist [Government of Saudi Arabia]	Fig In SYR

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	17			It would be useful to give quantitative information about the rate of Arctic sea-ice loss. Suggest inserting "The Arctic summer sea-ice minimum has declined at a rate that is very likely in the range 9.4 to 13.6% per decade." [Government of United Kingdom of Great Britain & Northern Ireland]	Too detailed
SPM	6	17			A reference to Figure 1.1 is made here. But there is no figure with this caption, probably it's the Figure SPM.1 which was referred here to or to the Figure 1.1 in the underlying report. [Government of Maldives]	reference moved
SPM	6	18	6	18	"increase in most regions..." is not consistent with the scientific evident in WG1. Is should be "increase in several regions..." [Government of United States of America]	Incorrect, taken from WG1 spm
SPM	6	18	6	19	In discussing mortality due to extreme heat and cold, can anything be said about the net change in mortality? Specifically, does the increase in heat-related mortality outweigh the decrease in cold-related mortality? [Government of United States of America]	Wrong section?
SPM	6	19	6	19	{1.2} could be refined to 1.2.3 [Thomas Stocker/ WGI TSU, Switzerland]	1.2.4 referenced
SPM	6	19	6	19	{1.4.2} is given as line of cite. Indeed 1.4.2 has a paragraph dealing about permafrost, but all the statements here (in SPM) are copy-paste from 1.2.3 and not from 1.4.2. Maybe the reference to section 1.4.2 should then be removed [Thomas Stocker/ WGI TSU, Switzerland]	Reject. 1.4.2 mentions shrinking glaciers as well.
SPM	6	19	6	19	It may be useful to say if emissions due to melting of prima frost is included in estimates or not. [Government of India]	Not clear
SPM	6	20	6	20	Here again, an introductory sentence, explaining the components of sea level rise, would be helpful for readers. For example, something like the following could be added: "Sea level rises due to expansion of warming ocean water and from the addition of new water from melting land ice." This would also nicely link this paragraph to the previous two (on warming of the ocean and melting of glaciers and ice sheets). [Government of Canada]	Too much detail
SPM	6	21	6	23	We would like to include that sea level rise is speeding up. We suggest to add: ", 1.8 mm yr-1 from 1901 to 1992 and 3.4 mm yr-1 from 1993 to 2010." [Government of Netherlands]	long term trend focussed on
SPM	6	21	6	23	It should be mentioned here that between 1993 and 2010 the speed of sea-level rise was almost double (3.2 mm / year) compared to the average since 1901 (1.7 mm). (WG1. SPM. Page 11) [Kaisa Kosonen, Finland]	long term trend focussed on
SPM	6	21	6	23	Please consider adding "The global mean sea level is rising." to the start of this para. [Government of Norway]	Reworded

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6	21	6	23	It is suggested that the justification included in WG1 - B4 section on sea level rise i.e. due to "glacier mass loss" and "ocean thermal expansion" is included somehow. It is considered that such information is relevant not only for PM but also for the general public, who most likely will read the Synthesis report over any other material and who often faces the issue on sea level rise w/o having the background of why the phenomenon takes place. In this way it is believe that the cognitive association, at least, between glacier mass loss and sea level rise is more often present in the general understanding. [Tabaré Arroyo Currás, Mexico]	Tutorial not needed at SPM level
SPM	6	21	6	23	Please add the information that sea level raise is regionally different. [Government of Germany]	too detailed
SPM	6	21	6	23	suggest to mention that highest rate of changes occurred during the last two deacades, as it reads in Section 1.2.4 [Lena Menzel, Germany]	long term trend focussed on
SPM	6	21	6	23	This is correct, but nowhere here is mentioned that the current rate of SLR is >3mm/y - this is the big news, not the 1901-2010 mean value. [Government of United States of America]	long term trend focussed on
SPM	6	23	6	23	Line of cite : 1.2 should be written in front of figure 1.1, in the actual form it is confusing (can be understood as figure 1.1 and figure 1.2) [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
SPM	6	23	6	23	{1.2} could be refined to 1.2.4 [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
SPM	6	23			Add at the end of sentence "and the rate of rise is accelerating" [Government of United Kingdom of Great Britain & Northern Ireland]	long term trend focussed on
SPM	6	23			The rate of the sea level rise from the SPM WG1 needs to be stated here. [Government of Maldives]	Too detailed
SPM	6		6		I suggest to include the figure of ocean acidification from WGI SPM [Carlos Méndez, Venezuela]	Not as robust as other evidence
SPM	6		6		Figure SPM-1, Top and middle panel: Please explain the different coulours in the figures. [Government of Sweden]	The coulours have been briefly addressed in the caption
SPM	6		6		Figure SPM.1: Please indicate what the reference year/period is for top and middle panels. And, please consider to use pre-industrial (1850-1900) as reference year at least for the temperature record. [Government of Norway]	WE want to match WG1 SPM
SPM	6		6		Figure SPM.1. Please consider to include an additional panel from WGI SPM that show the reduction in Arctic summer sea ice extent. Preferably Panel (b) from SPM WGI Figure SPM.3, or the uppermost left panel from Figure 1.1 in the current SYR draft that shows both Arctic and Antarctic summer sea ice extent. [Government of Norway]	Rejected, in text

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6		6		Figure SPM.1. Please consider to include a legend box in each of the panels that explains what the different colors represent. For the top and middle panel it would be the name of the different dataset, while for the bottom panel it would be the name of the greenhouse gases. This should also be properly reflected in the figure caption. For the bottom panel an appropriate text could be something like; "Atmospheric concentrations of the most important greenhouse gases; carbon dioxide (CO ₂ - green), methane (CH ₄ - orange) and Nitrous Oxide (N ₂ O - red) determined from ice core data (dots) and from direct atmospheric measurements (lines)". [Government of Norway]	The colours have been briefly addressed in the caption plus at the axis
SPM	6		6		Figure SPM.1. Please consider to show the difference between the two methods applied to calculate surface temperature change, by adding the linear trend and the periods 1880-1900 and 2003-2012 to the uppermost panel. [Government of Norway]	WE want to match WG1 SPM
SPM	6		6		The meaning should be given for several colour curves in Figure SPM.1 top and middle. [Zong-Ci Zhao, China]	In caption
SPM	6		6		It should indicate the anomalies/changes relative to years 1961-1990. The top figure is different from WG1 SPM Figure 1 that was relative to 1961-1990. Why do you change the reference years? [Zong-Ci Zhao, China]	In caption now
SPM	6		6		Figure 1 should be the same as topic 1 Figure 1.1, i.e., it should indicate the interval of abscissa by 10 years. [Zong-Ci Zhao, China]	adjusted
SPM	6				Figure SPM.1. In Figure SPM.1, reference years must be indicated for top and middle figures. [Government of Japan]	In caption
SPM	6				Figure SPM.1. In the top and middle panels of Figure SPM.1, descriptions about the color difference of lines and shading are missing. [Government of Japan]	Now in caption
SPM	6				Figure SPM.1 should be added with a caption : (1) As the three different colour lines in the temperature change chart are sourced from three data sets, it is suggested to make some explanations according to WG1 Figure SPM.1 (a); (2) it is suggested to add an annotation that the temperature rise is calculated relative to the 1961-1990 average. [Government of China]	accepted
SPM	6				Figure SPM.1: It might be useful to tell the reader what the different coloured lines represent in the top two panels. [Government of New Zealand]	Accepted
SPM	6				Figure SPM.1: The middle panel seems to be missing the satellite dataset which is plotted in Figure 1.1. [Government of New Zealand]	fig improved
SPM	6				Figure SPM.1. For bottom figure, it would be useful that caption below chart could state that line in orange corresponds to CH ₄ and line in red to N ₂ O, despite the pic's y-right axis is more or less clear. [Tabaré Arroyo Currás, Mexico]	Accepted
SPM	6				Fig SPM.1: Editorial: data sets for panels a and b? Write out GMSL and CH ₄ and N ₂ O. [Government of Canada]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	6				• SPM [P6] SPM Figure 1.1 colours are not explained, uncertainty bars should be included in all figures. [Government of Saudi Arabia]	The colours have been briefly addressed in the caption
SPM	6				Figure SPM.1: there is a lack of legends to help fully explain the data shown in the three graphs. [Government of United Kingdom of Great Britain & Northern Ireland]	Added to caption
SPM	6				Figure SPM.1. The color codings for the models are the parameters used for the upper two graphs are not given. Which gas is represented by "pink" in the lower graph. [Government of Maldives]	figure caption revised; specific suggestion rejected, detailed caption in topic1 file; referenced here
SPM	6				Figure SPM1, please explain what period corresponds to 0 or the baseline in axis Y of the 3 graphics [Government of Chile]	In caption now
SPM	6				Figure SPM1, please indicate the meaning of colors [Government of Chile]	Now in caption
SPM	7	1	7	1	change order of this paragraph and the paragraph at page 8. [Government of Sweden]	Done
SPM	7	1	7	1	specify which decades are meant. "recent decades" could mean since 1990 or since 1970s oder 1950s [Monika Rhein, Germany]	Reject - the multitude of studies do not all refer to the same decades. This also is approved SPM language
SPM	7	1	7	2	Suggest start with point of interest. [Government of Ireland]	Text reworded for clarity
SPM	7	1	7	2	Sentence on page 5 lines 26-27 is similar to the sentence on page 7 lines 1-2, but not identical. Why is there a difference ? Please clarify. [Government of Belgium]	It now is made identical
SPM	7	1	7	11	This para is well written, and the messages are very important, clear and easily understandable for the readers. The only thing that could make the para even more interesting if you also could describe if the shift in geographical ranges for terrestrial, freshwater, and marine species have already affected the food productivity and systems, especially for marine species we believe that this might be the case. [Government of Norway]	Space limitations have not allowed to do this. All relevant information is of course given in topic 1 and the WGII report.
SPM	7	1	7	11	In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans: Figure SPM2 shows marine ecosystems affected by climate change for many regions. Therefore, the paragraph on natural and human systems should emphasize the effect of climate change on natural systems, with special emphasis on the severity of climate change on the marine realm, which covers about 70% of the earth surface. [Lena Menzel, Germany]	Space limitations do not allow to be more specific here.
SPM	7	1	7	11	Animals and crops are mentioned, but one that has been noticed the most by the public is other plants (for example, garden species). If the underlying chapters support this, consider an additional sentence that expresses the state of knowledge on changing geographic regions for plants, as well as bloom dates. [Government of United States of America]	At the SYR level, this amount of detail is considered impossible.
SPM	7	1	7	11	Can the authors provide greater geographic specificity of these claims? [Government of United States of America]	No, we cannot, due to space limitations, beyond the high amount of detail provided by the figure.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	1		2	please specify whether "impacts" is negative or also positive? [Government of Netherlands]	There is no intention to assign positive or negative values at this point.
SPM	7	2	7	2	{1.4} should be moved at the end of the paragraph (line 11). Perhaps this requires adding additional sections to the line of cite. [Thomas Stocker/ WGI TSU, Switzerland]	Done
SPM	7	2	7	2	{1.4} could be refined to 1.4.2 [Thomas Stocker/ WGI TSU, Switzerland]	Done as well, thank you, Thomas
SPM	7	3	7	3	I think that this statement is too vague. Is "many" more than 50% of the region or species or are 6 regions or species "many" ? Remove in line 9 "many" before studies. I guess the statement cannot be made more specific? [Monika Rhein, Germany]	We believe that the only alternative to "many" would be a very large table for which there would be no space in the SPM.
SPM	7	3	7	3	After natural systems, can you add "Since humans can relatively quickly respond to climate impacts" [Government of India]	Reject. This text does not make assumptions about adaptive capacity of this kind.
SPM	7	3	7	5	Please consider to move these two sentences to the end of the para for completeness. [Government of Norway]	We agree for the second sentences and have moved it accordingly.
SPM	7	3	7	5	Suggest some rewriting to start with a sentence that provides some context. For example: "Natural systems (such as terrestrial and freshwater ecosystems) and human systems (including built or managed environments, as well sociocultural aspects of human communities) are potentially affected by climate change but also many non-climatic factors. Nonetheless, there is evidence that climate change has impacted natural and human systems, with a major or minor contribution of climate change distinguishable from other influences." [Government of Canada]	Reject. We believe that this suggestion adds many words without adding much information.
SPM	7	3			Evidence of climate-change impacts is strongest and most comprehensive for natural systems.' The sentence is very broad and induces to a few questionings about the IPCC format. Why is the evidence of climate change impacts strongest and most comprehensive for natural systems? The natural sciences are broadly looking at the climate change issue, while there is relatively less studies on the topic in the humanities. The sentence could indicate an unbalance of the scientific effort on the climate change issue. The natural scientists are very much involved with the theme and they have many different motivations and encouragement to develop research in the area. On the other hand, the humanities as social sciences, communication studies, political sciences and international relations do not have the major commitment with the IPCC report as the natural sciences do, for example. The sentence highlights that disequilibrium. There are two options to rebuild the phrase: i) changes could go to some more engaged text. Calling to the humanities attention and the governments incentives on more social studies development, or ii) do not show the unbalance and rephrase to 'Evidence of climate change impacts is strong and very comprehensive for natural systems'. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Reject. All these considerations have some truth in them, but there is no room here to analyze these matters in the SPM of an SYR.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	3			... of climate change impacts is strong and very comprehensive for natural systems'. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Reject. "Most" contains more information than "very".
SPM	7	4	7	4	suggest delete "major or minor" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	We find this distinction important and have maintained it.
SPM	7	4	7	4	This sentence uses the phrase "attributed to". Which definition of attribution with the SYR use? In this case the authors seem to be using the WGII definition with attributes impacts to climate change regardless of its drivers. [Government of United States of America]	This is correct and there cannot be any ambiguity since the sentence clearly refers to climate change. This point has been made many many times, and it is about time that readers recognise this difference, as the definition cannot be repeated in every single paragraph of the IPCC report.
SPM	7	4	7	4	major or minor sounds a little odd terminology here. Surely it's a continuum of attributable extent of contribution not either mostly or hardly at all which is what a lay reader may logically infer from this as it is stated. I am at a loss for a constructive replacement to suggest but wished to flag the potential for mis-interpretation by the reader here. [Peter Thorne, Norway]	We hope it is more clear now.
SPM	7	4	7	4	With a major or minor contribution ... unclear and too vague [Government of France]	For some systems, the contribution of climate change is major, for other it is minor - we know no better way of saying it than what is done here. Details can be found in WGII chapter 18.
SPM	7	4			The threshold or criteria for defining a "major or minor contribution" should be provided (perhaps in footnote) [Government of Ireland]	This is common language: "major" means "more than the others" and "minor" means "less than the others" - we do not think that this needs to be said.
SPM	7	4			"...with a major or minor contribution...from other influences" needs to be explained or exemplified. [Government of Sweden]	see response to SPM-1005
SPM	7	8	7	8	What is meant by "ongoing" ? [Peter Stott, United Kingdom of Great Britain & Northern Ireland]	It means that it continues to occur.
SPM	7	9	7	9	Many studies is high confidence? [Government of Venezuela]	Indeed, this is also indicated in this sentence.
SPM	7	9	7	11	Consider to indicate the actual number of studies, rather than just saying many studies. [Government of Norway]	This would require more detail than can be provided here - details are found in the WGII report.
SPM	7	9		11	Need to quantify the relative occurrence of positive to negative impacts including magnitude of these impacts. [Government of Ireland]	see response to SPM-1661
SPM	7	10		11	RETAIN: "Based on many studies covering a wide range of regions and crops, negative impacts of climate change on crop yields have been more common than positive impacts (high confidence)." ADD: Emergency. [Peter Carter, Canada]	We have rephrased following Internal-604, and we do not understand where the word "emergency" should have been added, nor why.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	10			There is no definition to 'negative' or 'positive' impacts. Too broad. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	The quantity of interest is clearly defined to be crop yields, and for these "positive" and "negative" have a simple mathematical meaning that requires no explanation.
SPM	7	11	7	11	Any evidence of poorer regions of the world being impacted more adversely? [Government of India]	The available studies do not allow this conclusion, even if the real situation may be as suggested.
SPM	7	13	7	14	The statement about the changes in extreme weather and climate events seems to imply that events observed since 1950 have only involved warming which may provide an incomplete/misleading picture. The disruption of elements of the climate system could cause cold temperature extremes similar to those observed in North America over the past winter, especially in short to medium term and in some areas of the Northern hemisphere). This risk should be adequately highlighted. Suggest text from WG1 SPM B.1. is used "Changes in many extreme weather and climate events...." [Government of United Kingdom of Great Britain & Northern Ireland]	accepted, text has been revised, and headline statement for extremes (where this topic is now covered) clarifies this
SPM	7	13	7	15	Please delete the space at the end of the sentence in bold; there is space between "influences" and the final dot of the sentence [JACQUES ANDRE NDIONE, SENEGAL]	section has been revised;
SPM	7	13	7	15	Please consider to rephrase the last part of the sentence in order to bring it in line with WGI SPM Section D.3 "..., and human influences have contributed to these changes.". In this finding please also consider to include heat waves and heavy precipitation events. Rationale: Looking at WGI Table SPM.1 it seems appropriate to include these parameters based on the likelihood and confidence level presented. For heavy precipitation the likelihood for further changes also makes this an interesting parameter to present. Also, for consistency with other parts of the SYR please consider to mention "increase in hot temperature extremes" before "decrease in cold temperature extremes". [Government of Norway]	this section has been moved to extremes paragraph where this is clarified and more complete
SPM	7	13	7	15	The wording "and some of these changes have been linked to human influences" conveys a weaker message than the assessments that is given in the WG1 SPM. For all of the specific examples that are listed in the bold sentence, WG1 Table SPM.1 indicates that it is likely (or very likely) that there has been a human contribution to the observed changes. These are substantially stronger findings than suggested by the evaluation "linked to", which could simply mean evidence of a correlation or other evidence that has not been quantified. Also, the word "linked" does not provide a calibrated assessment, while in fact, calibrated assessments are available. Recommend revising. [Government of Canada]	section has been moved to extremes section; wording maintained in headline statement as more detail on attribution is in bullets
SPM	7	13	7	15	Please include changes in heavy precipitation events over North America and Europe where they are likely. [European Union]	text has been shifted to extremes section; where pcip extremes are covered

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	13	7	19	it would be good to refer to the SREX report at the end of this paragraph [JACQUES ANDRE NDIONE, SENEGAL]	Thanks, references are to extended SYR sections and crossreferences to be found there
SPM	7	13	7	19	here again: what is "many" ? Or "some" ? Suggest to remove "many" in line 13 [Monika Rhein, Germany]	Rejected. Text from WG1; but detail now follows as text has moved to extremes section
SPM	7	13	7	19	The sentence 'some of these changes have been linked to human influences' should be deleted here, because 1) it is not elaborated in the untold text, and 2) the human contribution to climate change is specified in later items. [Government of Switzerland]	Accepted. Text modified, section moved
SPM	7	13	7	19	Can the authors include something about what we don't know about extreme events (e.g., tornadoes)? Non-experts and policymakers are prone to invoking trends and projections in "extremes" in blanket ways that can be misleading. [Government of United States of America]	rejected, level of detail not appropriate for SYR SPM
SPM	7	14	7	15	Suggest using the same language as in WGI on this. "Decrease in cold extremes..., increase in hot temperature extremes, ... increase in high sea level events" can be misunderstood or is not clear whether it implies changes to frequency, magnitude or both. [Government of Sweden]	accepted. Text modified.
SPM	7	14	7	15	"in high sea level events" change to "storm surge" [Hui JU, China]	Text modified, detailed suggestion rejected as not consistent with assessment.
SPM	7	14	7	15	The sentence cannot apply as it is to "high sea level events". The WGI report (and in particular Chapter 3 executive summary) states that "It is likely that the magnitude of extreme high sea level events has increased since 1970". Here the sentence applies to the period since about 1950. In addition, the results on extreme sea levels are not mentioned in the core of the synthesis report. [Serge PLANTON, France]	accepted. Text modified.
SPM	7	14	7	15	"increase in high sea level events" It is not clear what this supposed to mean. Does it mean sea level rise? It could be linked with wind intensification, atmospheric or ocean circulation change, as well. And these are not related to extremes. Should be omitted or be more precise. [Government of Hungary]	accepted. Text modified.
SPM	7	15	7	15	for style and clarity change to "...events; some..." from "...events, and some..." [Jonathan Lynn, Switzerland]	Accepted. Text modified.
SPM	7	15	7	15	Could you consider elaborating why it is difficult to link climate change to human influence- especially on extreme weather and climate events? This way the reader can better understand why extreme events differ somewhat from mean temperature rise. [Government of Norway]	Rejected. This is the SPM. More detailed text in the Reports
SPM	7	15	7	15	The authors should consider splitting this sentence - as is, it's too cumbersome: "events. Some..." [Government of United States of America]	Accepted. Text modified.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	15	7	17	Suggested to add qualifier "(very high confidence)" after "[...]Impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability[...]" Additionally, it would also be advisable that the following sentence is also adopted at the end of paragraph: "Local changes in temperature and rainfall have altered the distribution of some water-borne illnesses and disease vectors (medium confidence)" Otherwise, mortality can misleadingly be interpreted as main direct consequence of warming. [Tabaré Arroyo Currás, Mexico]	The text has been modified
SPM	7	15	7	17	From the previous sentence there is an implication that all of these changes are related to a human influence but e.g. for tropical cyclones and droughts there is 'low confidence' in observed trends and attribution {section 1.5} [Lisa Alexander, Australia]	Accepted. Text modified.
SPM	7	15	7	17	As this section is about impacts, it would be important also to refer to the impacts of these events, using the text of SPM WG2: 'Impacts of such climate-related extremes include alteration of ecosystems, disruption of food production and water supply, damage to infrastructure and settlements, morbidity and mortality, and consequences for mental health and human well-being.' [European Union]	The text has been modified
SPM	7	15		15	"human influences" is a bit vague and the focus here is anthropogenic climate change not other anthropogenic factors. Can this be changed to "...linked to human influence or the climate" or "... Linked to anthropogenic climate change" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Accepted. Text modified; wording from WGI report used
SPM	7	15		17	Impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability. It is valid for extremes or variability (in general)? (same for Topic 1 on page 44) [Government of Hungary]	accepted, Section has been moved to extremes section and text modified for clarity
SPM	7	16	7	16	Please be more specific here about what is meant by "cyclones". Tornadoes, tropical cyclones, extra-tropical cyclones, all of the above? [Government of United States of America]	all of the above, hence no change.
SPM	7	16	7	16	Are these extremes really related to the climate? If climate is a form of average weather and extreme events represent the extremes of the distribution of weather conditions then extremes would seem to be the opposite of climate. In other words, are the extremes of a distribution really a causal consequence of the mean? [Government of United States of America]	text has been revised and moved to extremes section
SPM	7	16			Cyclones cannot be considered an example of climate-related extreme event. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	rejected; frequency and intensity of cyclone is an aspect of climate
SPM	7	17	7	17	Does "...current climate variability" refer to climate variability as without climate change effects? If so, perhaps complement "...current climate variability. This signals vulnerability and exposure to impacts due to climate change." [Government of Sweden]	rejected, text appears clear

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	17	7	17	Can we add after climate variability "Particularly in developing country regions" [Government of India]	rejected
SPM	7	17	7	17	Suggest delete" to current claimte variability" the vulnerability and exposure is to the cliamte-related extremes already invoked at the beginning of the sentence. So don't need this. Also it may give the reader it is an issue of claitme variability not the change in variability or extremes due to anthropogenic claimte change [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Section has been revised; change to sentence rejected as it is clear
SPM	7	17	7	18	Is "decreaed cold-related mortality" a "vulnerability and exposure" (which is how the sentence is written) or one possible benefit of climate change? [Keith Shine, United Kingdom]	text has been revised
SPM	7	18	7	18	increased heat-related mortality and decreased cold-related mortality: please specify that human communities are addressed for this effect, because in the previous sentences "some ecosystems" are included. [Lena Menzel, Germany]	text has been revised to clarify
SPM	7	18		19	There are no findings quoted in section 1.5 which support the findings of "decreased cold realted mortality in some regions". The underlying text in WG11 Chp 11-4 is also inconclusive on this point. Suggest discussion of the impacts on mortality due to increase heat adn decrease cold separately, and assigning each with their appropriate confidence level. [Government of Ireland]	text has been revised
SPM	7	18			please specify mortality. Are they Human, trees, animal, or anything else? [Government of Netherlands]	text has been revised to clarify
SPM	7	19	7	19	Epidemiologic fallacy. Co-occurrence of mortality with heat and cold does not necessarily mean that the mortality is solely a result of warming. Particularly if the mortality is ultimately the result of something unrelated to climate (e.g. Heart attack) while shovelling snow. Snow shovelling may be the proximal cause but lack of exercise, diet and genetic susceptibility to cardiovascular disease are ultimately the reason for the heart attack. Not climate change. The so-called harvesting effect of heat wave mortality further supports the assertion that many (perhaps most) deaths during heat waves would have soon occurred anyway. [Government of United States of America]	text is consistent with WGII assessment
SPM	7	19	7	19	It's unclear why this statement is characterized as having only "medium confidence. The statement is based on historical heath records so it is known to be true. [Government of United States of America]	rejected, text based on WGII assessment
SPM	7	19			At the end of the line would be good to include information about precipitation events as info about the heat extremes have been mentioned. Therefore from the SPM WG1 "The frequency or intensity of heavy precipitation events has likely increased in North America and Europe. In other continents, confidence in changes in heavy precipitation events is at most medium" [Government of Maldives]	Accepted. Text modified and section on extremes mentions pcp extremes

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	20	7	21	Suggest to reword this to 'adaptation is becoming embedded in some planning processes, but actual implementation of adaptation measures on the ground is more limited. [Rachel Warren, United Kingdom]	text has been removed
SPM	7	21	7	21	"Depend" instead of "depends" [Government of France]	text has been revised
SPM	7	21	7	25	This paragraph is not very accessible to a non-academic audience. In particular the first sentence needs rewording. I do wonder whether the average policy maker would understand what is meant by 'differential risks from climate change'. [Rachel Warren, United Kingdom]	accepted, text has been revised
SPM	7	21	7	25	We feel this sentence is too technical to appeal to policymakers, and think shortlisting examples is to be preferred over abstract comprehensiveness. It would be better understood when vulnerability and exposure are in separate sentences. We also think there is an opportunity for synthesis. We suggest to rephrase to: "The large spread in vulnerability reflects a diversity in non-climatic circumstances such as income, gender, information, education, infrastructure and governance. Differences in exposure are associated with spatial variations in e.g. climate, adaptation measures, geomorphology and behaviour. Improvement in any of these factors may reduce the exposure to the physical impacts of climate change, and may be influenced by policies. The observed population growth in coastal cities further increases hindrance, damage and danger by climate change." [Government of Netherlands]	accepted, text has been revised
SPM	7	21	7	25	For some readers this para might seem to describe only vulnerability and exposure to extreme weather events. We believe that this is not the intention, and that it will be clearer for all readers if you could explicitly mention "climate related slow-onset disasters" in the last sentence. Please consider to re-formulate the last sentence to; "These differences shape differential risks from many aspects of climate change, ranging from climate related slow-onset disasters to climate and weather extremes." [Government of Norway]	text has been revised
SPM	7	21	7	25	This paragraph should be rewritten to make it less technical and give more information on the key points. E.g. by giving examples of what some of the key drivers are. [Government of United Kingdom of Great Britain & Northern Ireland]	text has been revised
SPM	7	21	7	25	The sentence is too vague - can the authors provide more specificity? Does this mean poor people are more at risk? [Government of United States of America]	accepted, text has been revised
SPM	7	21	7	25	Poorly constructed sentence ending with "consequently, so do their associated risks." The next sentence cites "multidimensional inequalities". This is unclear. The authors could also tone down the technical sound of "differential risks" in the last sentence. [Government of United States of America]	text has been revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	21	7	25	sentence needs to be re written so it is clear. It is heavily jargonised, whilst one gets the jist it takes several repeat reads to understand its meaning [Jason Fitzsimmonz, England]	accepted, text has been revised
SPM	7	21	7	25	This full paragraph does not seem to fit well here - this section is about Observed Changes, not about vulnerability. The first sentence (lines 21-22) is a general statement that should be removed; the former paragraph already links impacts, vulnerability and exposure to climate variability and change. The second sentence (lines 22-25) appears here linked to climate extremes, whereas in the aproved text (SPM WG2) it is not. It is suggested to substitute the full paragraph with the statement made in SPM WG2 page 8: 'Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty (high confidence)'. [European Union]	text has been revised
SPM	7	21	7	25	It is inconsistent for none of this paragraph to be bolded. Either bold the opening or merge with the prior paragraph for presentational consistency. [Peter Thorne, Norway]	accepted, section revised and no longer bold
SPM	7	21	7	28	This paragraph could be rearranged so that it starts with the Differences in vulnerability and exposure wich should be a statement in bold . [NIRIVOLOLONA RAHOLIJAQ, MADAGASCAR]	text has been revised
SPM	7	21		25	The 1st sentence is valid both for natural and human systems, the 2nd one underlines the significance of the social inequalities, the 3rd one repeats to some extent the finding related to the risks which is already referred to at the end of the 1st sentence. [Government of Hungary]	text has been revised
SPM	7	22	7	22	Suggest adding "of people and ecosystems" or "of affected systems" after the phrase "but also on exposure and vulnerability". Exposure and vulnerability are characteristics of affected systems, not of the impacts. [Government of Canada]	text has been revised
SPM	7	22	7	24	To keep the text short, perhaps the last part of the sentence ("...often produced by uneven development processes") could be removed, "non-climate factors and multidimensional inequalities" might be sufficient to explain the differences in question. [Government of Sweden]	section has been revised
SPM	7	22			Please clarify that the vulnerability definition has changed since AR4. [Government of Germany]	text has been revised
SPM	7	23	7	23	"inequalities" is not correct since some factors may be "equal" - just use "factors" - uneven development is a non-climate factor and may also prodcue equal factors - this is biased language and the authors should work to revise it. [Government of United States of America]	text no longer used

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	23	7	24	It would be good, within the SYR SPM, to avoid complex jargon such as "multidimensional inequalities" and "differential risks". More words might be required, but expanding these terms into plain language that is comprehensible by non-specialists would help to increase the impact of the SYR SPM. [Government of Canada]	accepted, text removed
SPM	7	23	7	24	Regarding the phrase "multidimensional inequalities...", it is unclear what the multiple dimensions are beside income inequality. We suggest deletion. [Government of United States of America]	text removed
SPM	7	23			Technical jargon such as "multidimensional inequalities" should be replaced with plain language. [Government of United Kingdom of Great Britain & Northern Ireland]	accepted, text removed
SPM	7	24	7	24	In this context it would be helpful to explain the "development processes", like socially, economically, culturally, politically, institutionally. [Government of Germany]	text revised
SPM	7	24	7	24	What is meant by "uneven" in this context? Unsustainable? Development processes that don't account for climate change, etc.? Please clarify. [Government of United States of America]	accepted, text removed
SPM	7	24	7	25	"Differences shape differential..." is vague. We suggest a more concrete formulation. Perhaps it is the same as in line 21-22. If so, consider leaving this statement out as it is confusing to readers. [Government of Netherlands]	accepted, text revised
SPM	7	24	7	25	The last sentence of this paragraph can be deleted as it doesn't add anything to the discussion (it essentially states that differences lead to differences). [Government of Canada]	accepted, text revised
SPM	7	24	7	25	The sentence: "These differences shape differential risks from climate change" is too technical for policy makers. A simpler and less scientific language is strongly recommended. E.g. These differences in development result in different levels of climate change risks. [Government of Austria]	accepted, text revised
SPM	7	24			please specify the type of development processes? Is it Socio-economic? [Government of Netherlands]	text has been revised, term no longer used
SPM	7	26			All information on attribution of observed changes to climate change should be moved here. In this context, the difference of attribution in WG1 and WG2 should be clarified. [Government of Germany]	section on attribution of impacts has been revised and clarified
SPM	7	27	7	27	No text is associated with this statement, only a very busy figure. [Government of United States of America]	text has been revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	27	7	29	We think the final part of the sentence "with more limited implementation of responses" is unclear. It is copied from SYR-46 lines 47-48, but cannot be traced back in non-bolded lines 48-55, unless it is supposed to reflect lines 54-55 where it says "... with very few assessing the process of implementation or the effects of adaptation actions". This is quite a different statement however. We would like to suggest to rephrase to: "Experience with adaptation is growing in both public and private sectors across the world. Adaptation is increasingly included in planning. Exposure reduction by means of engineered and technological adaptations are commonly implemented, and vulnerability reduction by increasing flexibility and learning is starting up. The effectiveness of adaptation measures has not yet been sufficiently analysed however." [Government of Netherlands]	text has been removed
SPM	7	27	7	29	why is this bolded? Or even necessary? (statement of obvious, truism) [Jonathan Lynn, Switzerland]	text has been removed
SPM	7	27	7	29	Do you have underlying research that could make this sentence more specific and to the point? Please consider rephrasing so that "adaptation experience" has context given the preceding sentence or define at first use. [Government of Norway]	text has been removed
SPM	7	27	7	29	Those sentences are copy paste from the SPM of WGII, but their meaning is not clear without contextual information. Please formulate this more clearly. [Government of Belgium]	text has been removed
SPM	7	27	7	29	Suggest this text about adaptation experience is out of place here. It interrupts the storyline as presented in the shaded box. No supporting information is presented. Consider deleting this text here. If retained elsewhere, supporting text is needed (similar to other bolded statement); however, suggest avoiding repeating lists of regional experience as presented in WGII SPM. [Government of Canada]	accepted, text has been removed
SPM	7	27	7	29	This para on adaptation does not fit in this section, please move to the relevant section, e.g. chapt. 3.2. [Government of Germany]	accepted, text has been removed
SPM	7	27	7	29	I am not sure this sentence is giving much useful information at this high level of summary. I think it is fine for the main report but not a highlight to draw up to SPM. It should be counterbalanced by where adaptation is not happening or is not sufficient to meet current and projected impacts [Joanna House, United Kingdom of Great Britain & Northern Ireland]	accepted, text removed
SPM	7	27	7	29	Some elaboration on the bold text is needed. [Government of Switzerland]	accepted, text removed
SPM	7	27	7	29	This paragraph interferes with the flow of observed changes in the physical system. [Government of United States of America]	text has been removed
SPM	7	27	7	29	Before the "Adaptation experience..." which comes out of the blue (first mention of 'adaptation') a paragraph on the inevitable need for adaptation is required or move these lines to a more appropriate section, e.g., 3.2 or 4.3 of the SPM [H-Holger Rogner, Austria]	text has been removed

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	7	27	7	29	This paragraph could be moved to one of the sections on Adaptation, but if you consider that it should remain here as an exemple of observed change in adaptation measures, it could remain at the end of the section but introducing a short explanation about this change. [Maria Carmen Llasat, Barcelona]	text has been removed
SPM	7	27	7	29	This paragraph does not seem to fit here (Section on 'Observed changes'). It has sense in WG2 because it was about changes in impacts, vulnerability and adaptation, but not for this synthesis report. Furthermore, this message does not provide much useful information. Some key messages on lessons learned developing adaptation (i.e. the decision making context) would be much more useful. [European Union]	text has been removed
SPM	7	27	7	29	The general meaning of this paragraph is understandable, but what is meant by 'more limited implementation of responses' ? [Government of France]	text has been removed
SPM	7	27			We think a statement like this on adaption is out of place and needs to be moved to topic 3. [Government of Netherlands]	accepted, text removed
SPM	7	27			change "sector" to "sectors" [Government of New Zealand]	text has been removed
SPM	7	28	7	28	The authors should split this sentence into two to improve readability: "communities. Adapt..." [Government of United States of America]	text has been removed
SPM	7	28	7	29	The sentence ending with "with more limited implemetation of resonses" is unclear. [Government of India]	text has been removed
SPM	7	28	7	29	It is not clear what is meant by "with more limited implementation of responses." [Government of United States of America]	text has been removed
SPM	7	28	7	29	the last part of the phrase "With more limited Implementation of responses" is not very clear. [Government of Chile]	text has been removed
SPM	7	28			", with more limited implementation responses." Unclear, difficult to understand [Government of Sweden]	accepted, text has been removed
SPM	7	28			The wording "more limited" gives rise to the question: more limited than what? I suggest you replace "more limited" with "limited". [David Wratt, New Zealand]	text has been removed
SPM	7	29	7	29	"implementation of ACTUAL responses." since if the response is just the "planning" as in the opening clause, this latter is not just about planning - is it? [Government of United States of America]	text has been removed
SPM	8	0	8	0	Unclear what it is the difference between when a symbol is within the bounds of the continent box, or placed independently on the map. Option: Any observed impact for the whole continent is in the box. Observed impacts that are only valid for a region could then be separate - e.g. in Europe, removed the snowflake outside the box and the fishes. Or remove the continent boxes. Or make clear in the caption that the ones in the boxes are regional changes, while the ones are local observed changes [Government of Netherlands]	The reviewer response shows that, intuitively, the reviewer has made the correct assumption, similar to all reviewers of WGII and the WGII approval plenary.
SPM	8	0	8	0	provide a title to the image [Government of Netherlands]	We find that the caption describes the map sufficiently.
SPM	8	0	8	0	the legend and letters throughout the image are not well readable. Please improve quality [Government of Netherlands]	This has technical reasons and will not occur in the final print of the report.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	0	8	0	There is only one figure on Figure SPM.2, so please delete the capital letter on the top left corner of the map. [Government of Netherlands]	Done, thank you.
SPM	8	0	8	0	Fig SPM.2: The figure creates the impression that there are few regional impacts in Africa and Latin America. Is this the case, or are there fewer studies of such impacts? The table should be revised, and / or text clearly separate the effect of fewer observations / studies, to distribution of impacts [Government of South Africa]	The interpretation that the lack of observed impacts reflects a lack of scientific studies is correct and was also made during the WGII approval plenary. The caption of the figure has been adjusted to reflect this more clearly.
SPM	8	0	8	5	Although we realize this figure is taken from the WGII SPM, we consider it as a static figure too complicated for policy makers, who will not study the embedded explanations. We think it may be represented in the electronic version of the SYR by an infographic that will allow for viewing separate regions, separate impacts, attribution levels, and confidence levels. We suggest to do this and add to the caption of this figure: "In the electronic version of this report, this figure is an infographic that allows for viewing separate regions, separate impacts, attribution levels, and confidence levels." [Government of Netherlands]	We do not understand why the figure should be removed and therefore decided to keep it in place.
SPM	8	1	8	1	Regarding Figure SPM.2: the figure seems to be very confusing as it sends a very clear and strong message that Africa (impacts on food production-major, livelihood - major, flood and droughts -major), is not affected by the impact of climate change, (the same applies for Asia in which Climate Change impact is unequivocal) while Europe is the region in the world the most to be impacted by the adverse impact of climate change. ALL observations shows the contrary. [Nedal Katbeh-Bader, Other - Palestine]	It is not clear what observations the reviewer refers to. As the caption says, the figure is an assessment of the studies since AR4.
SPM	8	1	8	1	In figure SPM.2 it seems surprising there is nothing on wildfire in Australia [Peter Stott, United Kingdom of Great Britain & Northern Ireland]	This is because wildfires in Australia have not been attributed to climate change outside natural variability (see WGII chapter 18 for details).
SPM	8	1	8	1	While a very useful figure, the colors chosen on this page when matched with the light gray titles for the continents are difficult to read (particularly the light/sky blue color for physical systems). The red color is dark enough to help the reader, however the blue and green are difficult to read. Also, the figure seems a bit blurry. [Government of United States of America]	Technical aspects will be much improved in the printed version.
SPM	8	1	8	1	This figure is one of the least effective. This is because it relies on use of too many elements before an interpretation can be made...first find the symbol and color, then look at the bars. The red draws the eye while the blue is too light. Even the dots of different size and color would have been better. Also the caption could be improved, in particular: Line 7: ..patterns of observed climate change impacts..attributed to climate change... [Government of United States of America]	Reject. Following enthusiastic support by the government of the USA during the WGII approval plenary, the figure was kept in place there, being considered highly effective.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	1	8	1	How can "outlined" impacts (e.g., wildfires in N Amer or rivers, lakes, floods and droughts in Asia) which are found to have a "minor contribution of climate change" be medium or high (i.e., 3 or four open bars) in "confidence in attributing to climate change"? These are inconsistent findings and need to be fixed. [Government of United States of America]	The individual information items in this map have a clear line-of-sight to the WGII SPM and WGII chapter 18. As such they have been reviewed multiple times, and the supporting table has been approved by the WGII plenary, following enthusiastic support by the US government.
SPM	8	1	8	1	Why do a number of impacts have both open and filled-in bars? For example, terrestrial ecosystems in Europe has two filled-in bars and two unfilled? This means that the confidence ranges from low to high? How is that possible? Please clarify. [Government of United States of America]	Explained by the caption.
SPM	8	1	8	1	In Fig. SPM.2 are any of the impacts positive or is this all negative? [Government of United States of America]	see response to SPM-1323
SPM	8	1	8	1	Figure SPM.2: Assignment of confidence level is inconsistent with those from the underlying WG chapters. For a confidence level/range is assigned to a collection of glaciers, snow, ice, and permafrost, while each parameter has its own confident level and should not be lumped together. This may cause the apparent notion of too high or too low confident level for the different parameters that should not be combined. [Government of United States of America]	see response to SPM-354
SPM	8	1	8	1	It is unclear how the geography is determined for the icons outside the continent box. Are these by continent and just duplicating what is in the box? What specifically does the lead line point to? Are these specific studies of a single location? Consider having only the by continent boxes, as the figure is currently very busy, and gives the impression each icon is one study (if that is the case, should be specified in caption) [Government of United States of America]	see response to SPM-1336
SPM	8	1	8	1	Figure SPM.2 is difficult to decipher and too small to read. For example, the coastal erosion and sea level graphic (observed impacts) is miniscule in the graphic and only appears with the small islands. Is this accurate? [Government of United States of America]	see response to SPM-352
SPM	8	1	8	1	Quality of figure SPM.2 should be improved [Government of Argentina]	see response to SPM-352
SPM	8	1	8	5	Caption of Figure SPM.2: Please consider rephrasing "observed climate change impacts in recent decades attributed to climate change" to either "observed changes in recent decades attributed to climate change" or "observed impacts of climate change in recent decades". Rationale: We believe it is superfluous to say both "observed climate change impacts" and "attributed to climate change" since "Climate change impacts" implicitly points to climate change as the cause, and that observations cannot be an impact before it has been attributed to a cause. [Government of Norway]	The caption has been rephrased to read in precisely the same way as it was modified during the WGII Approval Plenary.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	1	8	5	Figure SPM.2: While the figure provides a good overview, it is hard to read because the colours are too bleak and the font of the legend is too small, lucid and/or fuzzy. In order to increase readability use brighter colours (especially the blue is too lucid), bigger font and/or more defined font. Furthermore, the regional-scale impacts are somewhat confusing: i.e. in Central & South America there is high confidence that glaciers etc. are highly affected by climate change. However, not one Central/South American country in the figure shows affected glaciers etc. At the same time several Central/South American countries show affected rivers, lakes etc., but the regional-scale impacts only show the "glacier"-symbol. If this is not a mistake, the reasons should be explained. [Government of Germany]	see response to SPM-352
SPM	8	1	8	5	Figure SPM.2 is quite confusing in large part because the icons and code are so small and not necessarily intuitive to an uninitiated reader. Some specific issues of clarity arose when reviewing the image for Small Islands including that the legend describing the difference between filled and outlined symbols was extremely difficult to find and read. In addition, some specific issues with consistency with Chapter 29 arose during the review including (1) how can marine ecosystems impacts be both high confidence and low confidence (both filled and outlined fish appear in the box; (2) surprised to see only an outlined figure for Livelihood impacts for Small Islands since there is considerable discussion in Chapter 29 about the concentration of island communities and infrastructure along the coast; (3) Chapter 29 associates high confidence in impacts of sea level rise/inundation for small islands yet the icon in Figure SPM.2 appears to be outlined rather than filled; (4) one can interpret the outlined marine ecosystem impacts symbol for islands given the fact that there are many additional factors (for all regions not just islands) but the text of Chapter 29 tends to give a higher level of confidence in climate change impacts than the Figure does. Recommend that the lead authors of each of the regional chapters review Figure SPM.2 carefully for consistency with their chapters. If a Chapter reviewer can see some potential inconsistencies, the lead authors of the Small Islands (and other regional) Chapter(s) might help clarify and/or confirm consistency. [Government of United States of America]	see response to SPM-353
SPM	8	1	8	5	The SPM.2 only shows a desbalance of literature in regions. It doesn't give the attention to the most vulnerables. Africa with only one and Europe with 5 observed impacts. It gives the impresion that Europe is most vulnerable that Africa. [Government of Venezuela]	The IPCC can only undertake an assessment of the available scientific literature and this is what is represented here. The reviewer provides no suggestion as to which alternative information should have been presented in this figure.
SPM	8	1			Figure SPM.2 Caption: The threshold or criteria for defining a "major or minor contribution" should be provided (perhaps in footnote) [Government of Ireland]	see response to SPM-1005

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	2	8	2	Figure SPM.2: Regional-scale impacts boxes are misleading, probably due to bias in the literature and to the fact that smaller, more homogeneous regions are likely to have more different types of impacts en common to the whole region than large heterogeneous areas. From the figure it appears, for example, that Europe is more vulnerable (more regional scale-impacts) than Africa or Central-South America. I suggest that these boxes are deleted or replace by boxes with all the impacts found in the region. [Pedro Alfredo Borges Landáez, Venezuela]	Nothing in this figure is about vulnerability - it is an assessment of observed impacts where they have been studied and documented.
SPM	8	2	8	2	Asia impacts should involve" livelihood/economic" as its largest population and highest economic value [Hui JU, China]	This could be done if there had been solid assessments of such impacts from observations but this is not the case.
SPM	8	2	8	2	"attributed to climate change" - there is a serious ambiguity as to whether ths means anthropogenic climate change [Keith Shine, United Kingdom]	The ambiguity is entirely in the imagination of the reviewer. Attribution refers to climate change, and to nothing else, nor to any isolated component of climate change.
SPM	8	2	8	2	, attributed to climate change' should be deleted. [Government of Switzerland]	see response to SPM-1666
SPM	8	2	8	4	How were the major characteristics in each continent of Figure SPM.2 defined? For example, the opposite food production symbols between AUSTRALASIA box and Australia. Another example, there is flood symbol in Asia, but ASIA box did not have flood symbol. [Zong-Ci Zhao, China]	see response to SPM-1336
SPM	8	2	8	5	A footnote or direct reference to the underlying text (section 1.4) of what is meant by attribution is needed in the figure caption. [Haroon Kheshgi, United States of America]	see response to SPM-1790
SPM	8	2	8	5	Figure SPM.2 displayed 'symbols indicate affected systems and sectors, the relative contribution of climate change (major or minor) to the observed change'. However, no wildfires in Asia in southern Siberia are shown, although they are widely known both from scientific literature and media sources [Government of Russian Federation]	No studies of the attribution of such fires to climate change have come to our attention during the assessment, none have been contributed by earlier reviews made by the Government of the Russian Federation either.
SPM	8	2		5	Figure SPM 2 difficult to follow and it appears to not show any potential adverse health effects in the box for Europe. However in Figure SPM 7 (pg 120 lines 26-32)it clearly indicates the likelihood of increased heat related mortality in Europe. There is a high confidence to this.The reduction in cold related mortality should be low to moderate certainty as we have had some of our coldest winters on record in recent years. [Government of Ireland]	The map is not about any potential effects on anything - as its caption says it is about observed impacts, and no such health impacts have been observed.
SPM	8	2		5	Figure SPM 2 difficult to follow and it appears to not show any potential adverse health effects in the box for Europe. However in Figure SPM 7 (pg 120 lines 26-32)it clearly indicates the likelihood of increased heat related mortality in Europe. There is a high confidence to this.The reduction in cold related mortality should be low to moderate certainty as we have had some of our coldest winters on record in recent years. [Government of Ireland]	repetition of SPM-1025

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	5	8	5	"(Figure 1.2)" should be written between braces {} because it refers to something outside of the SPM [Thomas Stocker/ WGI TSU, Switzerland]	Done, thank you.
SPM	8	7	8	7	The term of well-mixed greenhouse gases should be explained more towards policymakers. (e.g. long enough lifetime to be homogenous in the troposphere, not like water vapour) [Government of Hungary]	No longer used
SPM	8	7	8	8	We think the addition of "the well mixed greenhouse gases" raises questions with policy makers that are not addressed here, and we suggest to simplify this sentence to read: "The concentrations of CO2, CH4 and N2O in the atmosphere have all risen sharply since the preindustrial era (40%, 150% and 20% respectively) Figure SPM.1, bottom panel)." [Government of Netherlands]	No longer used
SPM	8	7	8	8	Please consider to delete "well mixed" since it is not really vital information for readers of this type of document [Government of Norway]	Accepted
SPM	8	7	8	8	The bolded sentence speaks to changes in atmospheric concentrations, while the supporting text is about emissions. It would be useful to link the two topics by adding the phrase "in response to human emissions" after the words "preindustrial era" in the bolded sentence. [Government of Canada]	Accepted, now linked
SPM	8	7	8	8	We propose to add the following important information to this sentence: "...preindustrial era and have currently reached levels unprecedented in at least the last 800,000 years." [Government of Germany]	Rejected, not necessary here
SPM	8	7	8	9	Shorten and reduce technical details such as mention of well mixed [Government of Ireland]	Accepted
SPM	8	7	8	13	we think that the words in bold, should be added: "Atmospheric concentrations of the main well mixed greenhouse gases (CO2, CH4 and N2O) have shown large increases since the preindustrial era (40%, 150% and 20% respectively; Figure SPM.1). Despite multinational number of countries (high confidence). {1.3}". we also suggest to add the statement made on page 38 (line 18 til 21) --> Globally, economic and population growth continue to be the most important drivers of increases in CO2 emissions from fossil fuel combustion. The contribution of population growth between 2000 and 2010 remained roughly identical to the previous three decades, while the contribution of economic growth has risen sharply (high confidence). [Government of Netherlands]	Text reworded in line with comment
SPM	8	7	8	13	'Atmospheric concentrations of the well mixed greenhouse gases ...have all shown large increases since the preindustrial era'. But Figure SPM.1 shows that the large increase is observed since the industrial era, instead of preindustrial era. Furthermore, would it be possible to give a sense of the order of magnitude of the rate of increase? [Government of Switzerland]	Too technical, rejected

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	7	8	13	This is a very confusing bit of logic - it should begin with emissions and then discuss concentrations (see suggested opening bullet). The sequence here is very confusing as to what is being discussed. This bullet should follow the opening bullet on emissions and then move to concentrations. [Government of United States of America]	Accepted
SPM	8	7	8	13	This paragraph could be the first one [Maria Carmen Llasat, Barcelona]	Comment not clear
SPM	8	7	8	13	Isn't the first sentence too obvious to be a key statement? It would be better to start with information regarding the emissions trend. Also, the WGIII is clear that economic growth is the biggest driver of emissions increase. This is important to highlight here. Finally, in the final sentence, it isn't clear which period the SPM is referring to. At the start of the paragraph the reference is 2000-2010 - is the whole statement referring to this period? [European Union]	Accepted
SPM	8	7	10	17	Suggest to add a heading to all these paragraphs: "Attribution". [European Union]	Rejected, part of cause
SPM	8	7		13	RETAIN: "... The largest single driver of current climate change is the cumulative increase of anthropogenic CO2 emissions. The largest share of anthropogenic CO2 emissions is emitted by a small number of countries." [Peter Carter, Canada]	Rejected, text approved in WG3
SPM	8	7			• SPM [P8 L 7] define well mixed, add 'and Halocarbons as well as net emissions from forestry, agriculture and other land use' [Government of Saudi Arabia]	Not needed
SPM	8	7			According to Figure SPM.5 in SPM WG1, well mixed gases have Halo-carbons given in the table. Halo carbons seems to be missing in this line 7. [Government of Maldives]	Too detailed here
SPM	8	8	8	8	"multinational institutions" was not found in any background report as being related to mitigation of emissions, only national polities were. we suggest that "multinational institutions" is deleted. [Government of Netherlands]	from WG3 SPM
SPM	8	8	8	8	"International institutions and national policies" should be replaced with 'action under the UNFCCC and its Kyoto Protocol, other international efforts and national policies and measures' [Government of South Africa]	Rejected too detailed
SPM	8	8	8	8	large' - a firmer word needed - 'unprecedented' (WG1 SPM uses that word in the last 800K years context) [Venkatachalam Ramaswamy, United States of America]	Accepted
SPM	8	8	8	11	Please consider to make this sentence bold and move it to the front of the para. Rationale: This is in our view the most policyrelevant finding in this para. But it also a possibility to have both sentences in bold, i.e. having the bold statement cover lines 7-11. [Government of Norway]	Rejected, but text reworded

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	8	8	11	"Despite" This is a very negative way of putting this sentence. If they would have grown even more rapidly without multinational institutions and national policies then those policies can at least be recognised as being partially successful in mitigating emissions. If it cannot be asserted either way, then the first part of the sentence should be deleted. [Keith Shine, United Kingdom]	Accepted, although now used
SPM	8	8	8	11	The meaning of this sentence is as same as the following one (Line 13-14 on Page 9) [Songli Zhu, China]	Accepted, clarified
SPM	8	8	8	12	Please be more precise on what has caused the faster emissions growth since 2000 - it's, the energy sector and within it coal. As the WGIII, TS, page 46 says: "The energy supply sector is the largest contributor to global greenhouse gas emissions (robust evidence, high agreement). Greenhouse gas emissions from the energy sector grew more rapidly between 2001 and 2010 than in the previous decade; their growth accelerated from 1.7% per year from 1991–2000 to 3.1% per year from 2001–2010. The main contributors to this trend are an increasing demand for energy services and a growing share of coal in the global fuel mix." [Kaisa Kosonen, Finland]	Accepted, coal added
SPM	8	9	8	10	Please use approved WG3 SPM wording to describe the decadal increase in anthropogenic greenhouse gas emissions "anthropogenic GHG emissions have continued to increase over 1970 to 2010 with larger absolute decadal increases toward the end of this period" since as discussed in Berlin, the choice of year-boundaries for decades affects the perception of the relative strength of decade-over-decade increases. [Government of Canada]	Reworded
SPM	8	9	8	10	The period 2000-2010 might appear as a biased choice. For consistency with WGIII SPM, the formulation may be changed to "total anthropogenic GHG emissions have continued to increase over 1970-2010, with larger absolute decadal increases towards the end of this period". [Government of France]	Text clarified
SPM	8	9	8	11	Suggest moving the reference to Fig. SPM.3 to the middle of this sentence just after "have risen more rapidly between 2000-2010 than in the preceding three decades", since its current location (i.e., after "driven mainly by economic and population growth") can be misleading, since Figure SPM 3 groups GHG emissions by gas not drivers such as population. [Government of United States of America]	Accepted
SPM	8	9			• SPM [P8 L 9] define multinational institutions [Government of Saudi Arabia]	Rejected, too detailed
SPM	8	10	8	10	to delete the words: (and population) and keep by economic growth. [Nedal Katbeh-Bader, Other - Palestine]	Rejected, both are important
SPM	8	10	8	10	2000-2010 is not a decade - it is 11 years. [Keith Shine, United Kingdom]	Rejected, text is clear

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	10	8	10	Instead of referring to greenhouse gases in general, we think that the paragraph may need to refer to CO2 - as it was done in the WGIII SPM, page 8 (noting that this may not apply to CH4) : "Globally, economic and population growth continue to be the most important drivers of increases in CO2 emissions from fossil fuel combustion. The contribution of population growth between 2000 and 2010 remained roughly identical to the previous three decades, while the contribution of economic growth has risen sharply". [Government of Belgium]	Accepted
SPM	8	10			How do I see from figure SPM.3: "...driven mainly by economic and population growth"? Proposal: move the reference to the figure before the word "driven". [Government of Sweden]	Accepted, callout changed
SPM	8	10			It is stated that emissions grows due to population and economic growth. Figure 1.6 on page 39 shows that between 2000 and 2010 emission increases were also driven by carbon intensity of energy however energy intensity of GDP has slightly mitigated the rate of emission increases. This should be mentioned to give greater understanding on the dynamics of emission growth in the SPM. [Government of Netherlands]	Accepted, coal now mentioned
SPM	8	10			On 'Driven mainly by economic and population growth' should be explicit under 'non-green' conditions. Since it is already possible to have environmental friendly growth. [Renato Braghieri, United Kingdom of Great Britain & Northern Ireland]	Rejected, too detailed
SPM	8	11	8	11	we think the term 'cumulative increase' is confusing? Please change to "The largest driver of current climate change is anthropogenic CO2 emission." [Government of Netherlands]	Text changed
SPM	8	11	8	11	We suggest that "global" be added after "current" [Government of United States of America]	Global is clear from text
SPM	8	11	8	11	current' means what period? [Venkatachalam Ramaswamy, United States of America]	period stated
SPM	8	11	8	12	Suggested to add qualifier to "The largest single driver of current climate change is the cumulative increase in anthropogenic CO2 emissions". [Tabaré Arroyo Currás, Mexico]	Text reworded in line with comment
SPM	8	11	8	12	"The largest single driver...is the cumulative increase in anthropogenic CO2 emissions." "Cumulative increase in emissions" is a strange phraseology. One could simply say "anthropogenic CO2 emissions." Or to be hyper-accurate, one could refer to "the increase in atmospheric CO2 concentrations due to human CO2 emissions," since it is really increases in concentrations, not emissions, that drive climate change. [Government of United States of America]	Accepted, reworded
SPM	8	12	8	12	"The largest share" is unclear. More than 50%? Depends assumedly on where the line is drawn. Suggest some more clear wording. For example along the lines of "XX% from YY countries". [Government of Sweden]	no longer in doc

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	12	8	12	"largest" and "small" really MUST be quantified - is largest 80%? Otherwise this sentence is meaningless and should be dropped. [Government of United States of America]	Text reworded in line with comment
SPM	8	12	8	12	Please specify what activities the cumulative increase of anthropogenic CO2 emissions comes from (fossil fuel combustion and land use activities). [Government of United States of America]	Accepted
SPM	8	12	8	12	Instead CO2 emissions will be more adequate to refer to Greenhouse Gases. Substitute "CO2 emissions" for Greenhouse Gases (GHG) [Government of Venezuela]	Co2 needed here
SPM	8	12	8	12	It is important to improve this sentence with the inclusion of the words "since the pre industrial era": The largest share of anthropogenic since the pre industrial era is emitted by a small number of countries". [Government of Venezuela]	no longer in doc
SPM	8	12	8	12	Include what is in red. anthropogenic CO2 emissions since preindustrial levels. [Government of Bolivia]	no longer in doc
SPM	8	12	8	13	The sentence "The largest share of anthropogenic CO2 emissions is emitted by a small number of countries" does not report an observed change (the heading of the section SPM1 is "Observed changes". Therefore the sentence should be removed or rephrased so as to report an observed change. [Government of Sweden]	Accepted
SPM	8	12	8	13	It is suggested to delete "The largest share of anthropogenic CO2 emissions is emitted by a small number of countries.", since the increased atmospheric GHG concentrations were analyzed from such perspectives as composition, total, per capita, country, production and consumption in WG III Chapter 1, while a conclusion assessed only from country perspective is referred to here, which is not balanced or objective. [Government of China]	Accepted
SPM	8	12	8	13	.. Largest share by a small number of countries. Better write: 70% of the anthropogenic CO2 emissions come from 10 countries [Monika Rhein, Germany]	no longer in doc
SPM	8	12	8	13	Suggested to add qualifier to "The largest share of anthropogenic CO2 emissions is emitted by a small number of countries" [Tabaré Arroyo Currás, Mexico]	no longer in doc
SPM	8	12	8	13	Suggested to substitute "small number" by "limited number" [Tabaré Arroyo Currás, Mexico]	no longer in doc
SPM	8	12	8	13	The largest share of ... is by small number of countries. This does not really convey right message/provides a wrong information unless what % of emission and what % of countries with what % of global population share is mentioned. [Government of India]	Accepted
SPM	8	12	8	13	The "The largest share of anthropogenic CO2 emissions is emitted by a small number of countries." is not evident in any of the WG's SPMs. For it contains political implications and does not reflect agreed language, it should be deleted. [Government of Brazil]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8	12	8	13	Suggest deleting this statement - information here should focus on global-level trends. The current wording of this sentence is also quite vague and a similar statement was removed from the SPM by the WGIII authors their revisions after the final draft SPM review. [Government of Canada]	no longer in doc
SPM	8	12	8	13	Suggestion: include figure (Figure TS.5??) that represents the following sentence: "...the largest share of anthropogenic CO2 emissions is emitted by a small 12 number of countries". [Government of Chile]	no longer in doc
SPM	8	12	8	13	You could be more explicit about the sinks and reservoirs here and mention in particular the amount taken up by the oceans to provide a link to ocean acidification later. [European Union]	Reejected
SPM	8	12	8	13	Delete the following: The largest share of anthropogenic CO2 emissions is emitted by a small 12 number of countries. {1.3} It is neither ethical nor appropriate to refer to a small number of countries ahistorically. [Government of Bolivia]	Accepted
SPM	8	12	8	13	The sentence "the largest share of anthropogenic CO2 emissions is emitted by a small number of countries" is potentially problematic. Giving an indication on the timeframe under consideration would clarify the sentence. [Government of France]	no longer in doc
SPM	8	12		13	The final sentence, "the largest share...small number of countries", does not contain any useful information without an indication of which countries being discussed. [Government of Ireland]	Accepted
SPM	8	12		13	I do not see a figure showing the share of emissions per country. If politicians allow it, consider adding, it would be informative (maybe in the right panel of Fig spm3). [The largest share of anthropogenic CO2 emissions is emitted by a small 12 number of countries] [Alessandra Conversi, United Kingdom]	no longer in doc
SPM	8	13	8	13	(high confidence) should be added at the end of the sentence (see page 38 lines 12-13) [Thomas Stocker/ WGI TSU, Switzerland]	no longer in doc
SPM	8	13	8	13	Is it possible to name groupings of countries (if not the countries themselves) [Government of India]	no longer in doc
SPM	8	13			These countries should be named [Government of Sweden]	no longer in doc
SPM	8	13			Please consider including Figure 1.6 from page SYR 39 and/or the following sentence from SYR 38 lines 22-23: "Increased use of coal relative to other energy sources has reversed the long-standing trend of gradual decarbonization of the world's energy supply". This is an important finding showing that the decarbonization of the energy sector has been going in the wrong direction in the last decade and should be reflected in the SPM of the SYR. [Government of Norway]	Coal now mentioned
SPM	8	13			to add to all countries with developed economies and high levels of emissions, rather than restricted to few countries. [Government of Nicaragua]	no longer in doc
SPM	8	13			Atmospheric CO2 is increasing at rates over 200 times faster than during the average from the emergence from the last ice age. [Michael Casey, Ireland]	Too detailed here

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	8		8		Figure SPM-2. The figure is OK, but perhaps not the best ever produced. If something has to be taken away for space reasons, this could be a candidate. [Government of Sweden]	figure is use here
SPM	8				Fig. Spm.2. From a health perspective, it would have been preferable also with a symbol showing health effects exclusively. [Government of Denmark]	Fig is approved
SPM	8				Figure SPM.2. We believe that this figure includes too much information for readers to absorb. Please consider to either redraw the Figure with three panels, one for Physical systems, one for biological systems, and one Panel for human and managed systems, or remove all symbols with minor contribution from climate change. [Government of Norway]	Fig is approved
SPM	8				The SPM 2 figure has better resolution in other documents, what is less appreciated is the legend at the bottom. [Government of Costa Rica]	Fig is approved
SPM	8				Figure SPM 2 is already up to date in this document, but it is important to update the WGII Document. [Government of Costa Rica]	Fig is approved
SPM	8				Figure SPM 2: Very faint making readability extremely difficult. Consider increasing the font size or making it bold. [Government of Kenya]	typesetting
SPM	8				Figure SPM.2 Is there an error in the panel referring to small islands? There are two fish symbols, one in bold and one in light. [Government of France]	Fig is approved
SPM	9	0	9	0	please keep the original value of 49.5 Gt in 2010 for consistency with the text [Government of Netherlands]	Number no longer used
SPM	9	0	9	0	Consider 1 decimal case for all the percentages and GHG emissions values (Gt) attributed to the gases in the whole graph, as it is in the original graph of the background report. The way this percentages are shown, they don't give a total of 100% as they should. [Government of Netherlands]	Graph approved in WGIII
SPM	9	1	9	1	Spell out FOLU acronym in legend. There is space and no need to force the reader to go to the caption [Government of United States of America]	accepted
SPM	9	1	9	1	Fig. 3 text labels in figure inside are too small. Too much detail (should refer to original instead for full caption) [Government of United States of America]	Rejected, fig already approved
SPM	9	2	9	2	The abbreviation "GHG" is not explained. Can be done here or at page SYR-5 or SYR-8. [Government of Norway]	Accept
SPM	9	2	9	7	Suggest further explanation of why emissions are only for FOLU and not AFOLU. This was a point of confusion from the WGIII SPM. [Government of Canada]	Graph approved in WGIII plenary
SPM	9	2	9	7	• SPM [P9 L 2-7] Figure SPM 3 Suggest to use same language including quantified uncertainties as agreed upon the WGIII SPM page 6, Figure SPM 1 [Government of Saudi Arabia]	Reject, synthesis is not as detailed
SPM	9	3	9	3	QUOTATION: "CO2 from Forestry and Other Land Use (FOLU)" COMMENT: Please add (mainly due to deforestation) to the sentence. [Government of Norway]	Reject, too detailed

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	3	9	4	Figure SPM. 3. "methane (CH ₄); nitrous oxide (N ₂ O)"; The numbers of those chemical expressions should be in subscript. The "8" after "fluorinated gases" should be removed because there is no footnote. [Government of Japan]	Accepted.
SPM	9	4	9	4	Typo: "gases8" [Tony Weir, Australia]	Accepted.
SPM	9	4	9	4	There is the number 8 as a typo - gases8 [Peter Thorne, Norway]	Accepted.
SPM	9	4	9	4	Legend to the Figure SPM.3. In this part of the sentence "fluorinated gases8 covered...." it must be eliminated the number "8". Please explain which are the "fluorinated gases" and why the Halocarbons are not included in this figure, if in Figure RRP.5 of the WG1/SPM Report, the Halocarbons (CFCs and HCFs) have a greater Radiative forcing than N ₂ O. [Government of Argentina]	Approved WG3 figure so not changed
SPM	9	4	9	7	remove 8 from gases8; define GWP100 in a footnote (as on page 36 footnote 6) [Monika Rhein, Germany]	Partly ccepted, GWP in glossary
SPM	9	4			fluorinated gases covered under the Kyoto Protocol ~ The recent amendment of the Kyoto Protocol included also NF ₃ , thus, it would more precise: "fluorinated gases covered under the 1997 Kyoto Protocol" (same comment for p.17 line 4) [Government of Hungary]	Rejected too detailed, NF ₃ is tiny contribution would see it
SPM	9	6	9	6	Please consider to replace "the error bars" with "black whiskers" [Government of Norway]	Accepted.
SPM	9	6	9	7	If emissions of non-CO ₂ gases are converted into CO ₂ -equivalents, this has been consequently based on GWP100 throughout all IPCC-reports of all Working Groups and the Taskforce. Mentioning this fact here is confusing, since it wrongly suggests that this would not be the case elsewhere in this SYR. We consequently suggest to delete this sentence. [Government of Netherlands]	wording changed for clarity
SPM	9	7	9	7	It is unclear in the figure caption where to look for Figure 1.4 [Rachel Warren, United Kingdom]	Accepted.
SPM	9	7	9	7	(Figure 1.4) should be written between braces {} because it refers to something outside of the SPM [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.
SPM	9	9	9	9	The word "about" is not being used very well here, because in fact, as it is even referred in the background report (WGI 6.3.1, page 486 (502 of the pdf), the correct phrasing is "less than half". Thus I suggest to change "about" by "Almost" [Government of Netherlands]	Accepted.
SPM	9	9	9	10	To increase readability of this very important message you should consider to rephrase this sentence and to use a more non-academic language. Please consider to rephrase to "About half of all anthropogenic CO ₂ emissions has been emitted over the last 40 years.". Especially the use of "have occured" might be misinterpreted as if this is something that just happened, while it is actually a result of human activities. [Government of Norway]	Reected. The proposed change does not improve clarity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	9	9	11	The CO2 cumulative emission period at lines 9-10 is 1750-2010, which is different from that at line 10-11, 1750-2011. The similar problem is found at lines 8-12 page 36. They all are needed to be corrected or explained. [WENJIE DONG, CHINA]	We now use Wg1 numbers converted to GtCO2
SPM	9	9	9	16	Shorten and reduce technical details such as carbon cycle reservoirs (say forests, soils etc) [Government of Ireland]	Accepted.
SPM	9	9	9	16	This comment asks whether two statements, on different pages, are consistent. SPM p9 11-12 states "About half of these anthropogenic CO2 emissions have remained in the atmosphere 11 (880 ± 35 GtCO2) since 1750." P. 15, 13-5 says "The effects of CO2 3emissions persist for centuries; depending on the scenario, 15-40% of emitted CO2 will remain in the atmosphere longer than 1,000 years {2.1}." It's roughly 250 years since 1750, a quarter of 1000 years. How can both statements be true? If a full 50% ("half") have disappeared after 250 years, then another 250 years, one would expect 25%, and 12.5% by 750 years, and 6.75% by 1000 years. Yet it is much higher, 15 – 40%, that remain after 4 x 250 years. [Government of South Africa]	Text approved WG1 so not changed
SPM	9	9	9	16	Any differences between WG1 and WG3 should be clarified. Please give a reference to the source of these sentences. [Government of Germany]	Text clarified
SPM	9	9	9	16	Here, GtCO2 is used whereas WG1 SMP uses GtC. Some readers of both SPMs are going to be confused. That taken up by the oceans is not mentioned. [Venkatachalam Ramaswamy, United States of America]	We now use Wg1 numbers converted to GtCO2
SPM	9	9	9	16	This paragraph could be the second one [Maria Carmen Llasat, Barcelona]	rejected, logical flow better to start with first paragraph
SPM	9	9	10	17	SPM-section1: What are the messages or lessons the authors want to say with these three paragraphs? The First part (line 9 - 16 in page 9) should indicate as it is based on {1.3} in the underlying report. [Government of Republic of Korea]	Structure changed
SPM	9	9			please replace "increase 1970-2010?; by 65% in 2010? [Government of Netherlands]	Reject, text clear
SPM	9	10	9	10	We agree that most readers will find it easiest to think in terms of GtCO2 rather than GtC, but suggest that a footnote to equivalent values in GtC is needed here to maintain the traceability to the WGI SPM conclusion on anthropogenic CO2 emissions between 1750-2011. [Government of Canada]	Reject, too detailed
SPM	9	10	9	10	Draft states that cumulative emissions of CO2 were 2000 whereas the WG I SPM states 1890 GtCO2 as well as the SYR on page 11 line 22; please check and make transparent the reasons for any differences in numbers. [Haroon Kheshgi, United States of America]	Text clarified WG1 no. now referenced

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	10	9	12	2000 GtCO ₂ is to be replaced with 2035 GtCO ₂ , or "between 1750 and 2011" is to be replaced with "between 1750 and 2010". This can be calculated by having 555 GtC (cumulative anthropogenic emission from 1970 to 2011, stated on the 2nd bullet on p. 10, WGI SPM) multiplied by 44/12 to be converted to 2035 GtCO ₂ . In 1970-2011, 2000 GtCO ₂ is correct. Although "about half" is valid as a round number of accumulated emission amount in the atmosphere, "about half (43% (240 GtC/555 GtC))" or "about half (43%)" would be more informative. At least, these details should be added in the longer report. 240 GtC comes from the 3rd bullet on p. 10, WGI SPM. [Government of Japan]	Text clarified WG1 no. now referenced
SPM	9	10	9	12	Value 555 ± 85 PgC in WGI 6.3, which does not agree with the 2000 stated here after conversion. Check these conversions again. Not rounding the values to 2 significant digits to keep consistency with the background reports would be better. [Government of Netherlands]	Text clarified WG1 no. now referenced
SPM	9	10	9	16	• SPM [P9 L10-16] insert Of these anthropogenic CO ₂ emissions, 880 ± 35 GtCO ₂ have remained in the atmosphere, 568 ± 110 GtCO ₂ have been taken up by the ocean and 587 ± 90 GtCO ₂ have accumulated in natural terrestrial ecosystems [Government of Saudi Arabia]	Too much detail
SPM	9	10			the 2000 +/- 310 number does not match the 1890 number (1630-2150) on pge 11 line 22/23 [Michael Casey, Ireland]	WG1 numbers used
SPM	9	11	9	11	There has been a large confusion about the century half life time for CO ₂ . As it stands, the reader might think that half of the emissions will continue to be absorbed by sinks independently of the emissions, while this is not true. Please indicate that the sinks are due to the increasing atmospheric concentration (this might be done in another section of the SPM, but the explanation that the sinks are not there forever needs to be somewhere). [Government of Belgium]	Reject, too detailed
SPM	9	11	9	11	Consider instead: "about half of these anthropogenic CO ₂ emissions since 1750 remain the atmosphere today." [Government of United States of America]	Slightly reworded
SPM	9	11	9	11	The correct year of reference should be 2010 not 2011 (1750-2010) [Government of Venezuela]	Reejct, WG1 numbers now used
SPM	9	11	9	12	Suggest rewording "About half of these anthropogenic CO ₂ emissions since 1750 remain in the atmosphere (880 ± 35 GtCO ₂). [Government of New Zealand]	Timeline clear

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	11	9	13	In SPM WG1, CO2 emissions 1750 - 2011 are 545Gt C. From these 240 Gt C remains in atmosphere (44% also about 40% and not 50%). Suggest to rephrase the two subsequent sentence starting in line 11: About 40% of these anthropogenic CO2 emissions have remained in the atmosphere. 30% have been taken up by the ocean and 30% accumulated in natural terrestrial ecosystems. I think that the information where the CO2 is stored should be included in this statement [Monika Rhein, Germany]	Rejected, too detailed
SPM	9	12	9	12	Converting the values in PgC in the original report (WGI 6.3) to GtCO2, using the conversion factor 3.67, sometimes gives another value than presented in SYR: e.g. 880 +- 37 (instead of 880 +- 35); Suggest that these conversions are revised and referenced to WGI not WGIII [Government of Netherlands]	Accepted
SPM	9	12	9	12	Please consider to replace "was" with "has been", and if appropriate include "natural" before "sinks". We believe these proposed changes will make it easier for the reader to understand. [Government of Norway]	Taken into account. Text modified.
SPM	9	12	9	12	"natural" - it could be argued that these natural carbon reservoirs are no longer natural, also that fossil fuel C is natural. - just drop the term. [Government of United States of America]	Taken into account. Text modified.
SPM	9	12	9	13	We feel that "sinks" and "carbon cycle reservoirs" are unnecessary jargon, and think shortlisting examples is to be preferred over abstract comprehensiveness. We suggest to amend the sentence to: "The rest was removed from the atmosphere and dissolved in the ocean or stored as organic matter, such as wood and in soils." [Government of Netherlands]	Taken into account. Text modified.
SPM	9	12	9	13	This sentence about carbon sinks and reservoirs is not preceded by any text explaining what is meant by these terms or by an introduction to the carbon cycle. This is another place where the reader would be helped if at least one sentence of explanatory text was added to provide some context. Suggest avoiding use of technical jargon if possible. Suggest, for example, new wording such as "The rest was removed from the atmosphere and stored on land (in plants and soils) and in the oceans." [Government of Canada]	Accepted.
SPM	9	12			Delete "since 1750" after the parenthesis, This implies that half the CO2 present in the atmosphere in 1750 is still in the atmosphere. I believe the intent is to say that half of the CO2 emitted since 1750 is still present. The present wording also creates ambiguity in the following sentence, where "the rest" of the CO2 is discussed. [Government of Ireland]	Reworded
SPM	9	12			"were" not "was", suggest to add "ocean and land" sinks, I find the use of "natural carbon cycle reservoirs" odd when the reservoirs are storing anthropogenic carbon. Suggest instead "The rest were removed from the atmosphere by natural carbon cycle processes into land and ocean sinks." [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Taken into account. Text modified.
SPM	9	13	9	13	define MAGICC6 in a footnote or in an extended figure caption or refer where it is explained in the SYR (I haven't found it) [Monika Rhein, Germany]	No longer referenced

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	13	9	13	We suggest to delete the word "cycle" - it does not seems needed. [Government of Belgium]	Accepted
SPM	9	13	9	14	This seems to repeat previous bullet [Keith Shine, United Kingdom]	Accepted, reworded
SPM	9	13	9	14	Perhaps the statement "Total anthropogenic GHG emissions have continued to increase over 1970 to 2010 with larger absolute decadal increases toward the end of this period (high confidence)" provides same insight as the sentence stated in Page. 8 Lines 9 to 11: "Despite multinational institutions and national policies aimed at mitigating emissions, anthropogenic greenhouse gas emissions have risen more rapidly between 2000-2010 than in the preceding decades, driven mainly by economic and population growth (Figure SPM.3)." Suggested to merge both somehow to avoid repetition. [Tabaré Arroyo Currás, Mexico]	Taken into account. Text modified.
SPM	9	13	9	14	The meaning of this sentence is as same as the content from Line 8-11 on Page 8. It could be deleted. [Songli Zhu, China]	Accepted
SPM	9	13	9	16	Isn't this a repeat of the intro section? If so, it can be deleted to save space and prevent redundancy. [Government of United States of America]	Accepted
SPM	9	13		16	RETAIN: "Total anthropogenic GHG emissions have continued to increase over 1970 to 2010 with larger absolute decadal increases toward the end of this period (high confidence)." ADD: The combustion of fossil fuels and biomass for energy leads to greenhouse emissions of black carbon, CO2, methane, nitrous oxide, and tropospheric ozone. Only by replacing these deadly polluting greenhouse sources with clean, abundant, zero/lowest-carbon, everlasting energy sources can catastrophic global climate change be avoided. [Peter Carter, Canada]	Rejected too detailed
SPM	9	13			"carbon cycle reservoirs." ~ carbon reservoirs. [Government of Hungary]	No longer referenced
SPM	9	14	9	16	This statement has a very important idea that can be illustrate with the figure 1.8 of the chapter 1 of WGIII report. Please include this Figure. [Carlos Méndez, Venezuela]	Rejected, too detailed
SPM	9	14	9	16	This statement is a bit confusing, especially since the number (78 %) can't be found in the Figure SPM.3 directly. Please consider just referring to the period 1970-2010 or alternatively reflect the exact numbers for the period 1970-2000 and the number for the period 2000-2010. [Government of Norway]	Rejected, text is clear
SPM	9	14	9	16	Has not the proporational contribution of fossil fuels increased throughout this period as LUC emissions have stayed relatively the same (or declined slightly) and FF emissions have continued to rise. I think this is an important point to make. In fact 78% looks wrong for 1920 to 2010. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Rejected, text approved in WG3
SPM	9	14			Replace "toward" with "at" for clarity [Government of Ireland]	Text not there now
SPM	9	14			The term "absolute" may be technical ofor a SPM. Suggest delete [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	15	9	17	Information about the Detection & Attribution of human influence on impacts, even if less formally quantified, could be integrated here with the appropriate language; this will facilitate integration in SPM. [European Union]	Accepted
SPM	9	15			Unclear if fossil fuel combustion and industrial processes contribute to 78% of total (i.e. including natural) OR total anthropogenic GHG emission. I suggest to reformulate a sentence as "Co2 emissions from fossil fuel combustion and industrial processes contributed to increase from 1970 to 2010 by about 78% of the total GHG emission." [Government of Netherlands]	Text clarified
SPM	9	16	9	16	{1.3.2} missing at the end of the paragraph [Thomas Stocker/ WGI TSU, Switzerland]	Accept
SPM	9	16	9	16	Please consider to include a new sentence to this para that describes the evolution of CO2 emissions from fossile fuel and industrial processes. We suggest something like; "In 2003-2004 (check the data for precise year), CO2 emissions from fossile fuel and industrial processes alone was as large as total anthropogenic GHGs emissions where in 1970." [Government of Norway]	Reject, too detailed
SPM	9	16	9	16	Is the meaning here that fossil fuel combustion and industrial processes contributed 78% of the increase in GHG emissions from 2000-2010? Or to the total emissions over this period? Clarify. [Government of Canada]	Yes, text clarified
SPM	9	16	9	16	Replace "from 1970 to 2010..." with "throughout the period" [Government of United Kingdom of Great Britain & Northern Ireland]	Between now used
SPM	9	16	9	16	Would it not be interesting for the reader to insert a footnote indicating that 1ppm of atmospheric CO2 contains 7.78bn tons CO2 or 2.13bn of C and that 1 ton of C combusted = 3.67 tons CO2? [Government of Switzerland]	Reject, this is not a tutorial
SPM	9	16			There is a missing space character between 'from' and '1970'. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Accept
SPM	9	16			Insert footnote that 1ppm atmospheric CO2 contains 7.78bn tons CO2 or 2.13bn of Carbon. 1 ton of carbon combusted = 3.67 tons CO2. [Michael Casey, Ireland]	Reject, too detailed
SPM	9	17	9	17	Some information about emissions by sector should be included. We would suggest adding the following text from SYR 37 lines 12-17: "Since 2000, GHG emissions have been growing in 11 all sectors, except AFOLU. Of the 49 (±4.5) GtCO2eq emissions in 2010, 35% (17 GtCO2eq) of GHG 12 emissions were released in the energy supply sector, 24% (12 GtCO2eq, net emissions) in AFOLU, 21% (10 13 GtCO2eq) in industry, 14% (7.0 GtCO2eq) in transport and 6.4 % (3.2 GtCO2eq) in buildings. When 14 emissions from electricity and heat production are attributed to the sectors that use the final energy (i.e. 15 indirect emissions), the shares of the industry and buildings sectors in global GHG emissions are increased to 16 31% and 19%, respectively (Figure SPM.2). {WG III 7.3, 8.2, 9.2, 10.3, 11.2}" [Government of Norway]	Partly accepted, some detail added

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	17			Please include information on sectorial emissions, using the information from WG3 SPM top of P 7 of the edited version. [Government of Germany]	Partly accepted, some detail added
SPM	9	17			Insert that greater than 95% of energy sources globally produce CO2. [Michael Casey, Ireland]	Reject, too detailed
SPM	9	18	9	18	"Human influence has been detected ...". The term detected is not quite right as detection of an object which is observable is usually a right application of the term. Human influence cannot be detected. . But here it means evidence based analysis shows... so detected may be replaced by an appropriate word. [Government of India]	rejected, wording approved in WGI and 'detection' refers to human influence
SPM	9	18	9	20	We feel the word "detected" conveys the message that the human influence was either very small or extremely difficult to deduce, and this statement would then contradict the following sentence, where it is "extremely likely that human influence" was "dominant". We suggest to replace the word "detected" by "demonstrated". [Government of Netherlands]	text based on approved WGI report
SPM	9	18	9	20	This conclusion is redundant since it has been mentioned earlier in the SPM. [Government of Netherlands]	text has been revised to avoid duplication
SPM	9	18	9	20	While informed readers will have the necessary background to understand that the word detection here has a formal, technical meaning, to novice readers, this sentence will probably read as if human influences on the climate system are just barely detectable. Suggest simplifying to: "The evidence demonstrates a human influence on warming of the atmosphere....etc." [Government of Canada]	text has been revised; second sentence makes importance clear
SPM	9	18	9	21	From ES in Chpt 10, the climate extremes do not contribute to the 'extremely likely' confidence statement as the others in the list. Suggestion: remove 'and some climate extremes' [Government of Netherlands]	statement has been revised
SPM	9	18	9	21	Please consider to change the order of the two sentences, because the last sentence is in our view the most policy relevant, and it summarizes the previous sentence. [Government of Norway]	text has been revised; but logical flow works better as is
SPM	9	18	9	21	Suggest that you reverse the order of these two sentences such that the stronger statement is placed first. [Government of Canada]	rejected, second sentence is elaboration on part of first,
SPM	9	18	9	21	The bold text comes at a rather unexpected place here after the section on emissions and the evidence this paragraph summarizes comes a few sections earlier. Please move to P 7 L 26. [Government of Germany]	text has been revised; with new heading
SPM	9	18	9	21	Human influence has been detected in...: Ocean acidification should be included in this bold statement and in the following specifications, as all marine organisms are already responding to ocean acidification due to anthropogenic CO2 emissions [Lena Menzel, Germany]	headline statements have been revised ; ocean acidification see impacts
SPM	9	18	9	21	This paragraph deserves a Box. [Government of United States of America]	headline statements have been revised
SPM	9	18	9	21	Suggest that this paragraph is boxed. [European Union]	headline statements have been revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	9	18	10	17	We appreciate the description of findings related to human influence, but in the current draft we lack a description of how human influences have contributed to changes in extremes such as heat waves, heavy precipitation, cold/hot days, high sea level events. [Government of Norway]	Rejected, extremes are discussed in the next section
SPM	9	18	10	17	These paragraphs would be the 10th and 11th respectively [Maria Carmen Llasat, Barcelona]	noted.
SPM	9	18	10	17	It feels extremely odd that this set of analyses comes so late and is divorced for the statement starting p.7 line 1. Surely for narrative continuity this set of findings should precede that one. I would place immediately before it so that it follows the observed basis on which in part it is based. [Peter Thorne, Norway]	text has been revised
SPM	9	20	9	20	The authors should provide examples of "changes in some climate extremes" as this type of explicit information is highly valued by policymakers. [Government of United States of America]	statement has been revised, see extremes section now
SPM	9	21	9	21	since the mid-20th century.{1.4} No reference to dates must be made. [Government of Bolivia]	text has been revised, but reference to mid-20th century consistent with WGI assessment
SPM	9				Figure SPM.3. Please consider if you can either write the growth rate over the periods in clear text or include "Average annual growth rate over different periods is highlighted with the brackets" in the figure caption. For 1970-2000 the clear text suggestion might be something like "The average growth rate over the period from 1970 to 2000 was 1.3 percent per year". [Government of Norway]	rejected, figure from WGIII report
SPM	10	0	10	0	"Total Anthropogenic forcings" on the y-axis of the diagram would be better than "combined anthropogenic forcings", since it explains better what it means [Government of Netherlands]	figure based on WGI report; combined relates to combination of two bars above and hence helps understanding
SPM	10	0	10	0	Give a correct title to the x-axis of the diagram ("Temperature trend") [Government of Netherlands]	figures have been revised; x-axis labelling consistent with other figures
SPM	10	0	10	0	it is not clear what is the reasoning behind the grey shadings on the bars of "Observed warming" and "Combined anthropogenic forcings". It seems that the idea is to highlight something, but it gives some confusion, suggestion to delete them from the diagram. If the intention is to compare the "observed warming" bar with the "combined anthropogenic forcings" bar, please reorganize the bars by putting the "combined anthropogenic forcings" bar immediately after the "observed warming" bar. [Government of Netherlands]	figure caption has been simplified. Reviewer captured intention of the comparison
SPM	10	0	10	0	It is not clear what is meant with the bar "Internal variability", and the caption to the diagram doesn't give an explanation as well. So, if an explanation of what "Internal variability" means is not possible, suggest this bar be removed from the diagram. [Government of Netherlands]	internal variability now explained in caption
SPM	10	0	10	0	Figure SPM4: if the colors are meaningful in this context, a legend would be very helpful. See also comment on Topic 1 figure 1.2 page 35 [Lena Menzel, Germany]	caption has been improved

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	0	10	7	The use of capitals in the figure is inconsistent and we suggest to avoid capitals entirely in this figure. The wording in the title and caption emphasises uncertainty, thus overshadowing the real message about the relative contributions of different factors to observed warming. We suggest to delete the subtitle "Likely ranges (wiskers) and their midpoints (bars)" as this is repeating information in the caption. We also suggest to rephrase the caption to: "Figure SPM.4: Contributions to observed warming due to well-mixed greenhouse gases (green), other antropogenic forcings (yellow), combined antropogenic forcings (orange), natural forcings (blue) and natural variability (purple). Likely ranges are indicated by wiskers. (Figure SYR 1.2)" [Government of Netherlands]	Captials are used to highlight observed warming; deletion of subtitles accepted; caption has been revised
SPM	10	1	10	1	This very prominent figure is certainly technically correct within its framework of assumptions. However, to the layman it seems to suggest that natural forcings and internal variability of the climate system are neglible vis-à-vis anthropogenic factors. This seems inconsistent with the very careful consideration of uncertainties in WGI e.g. regarding the discussion of the global warming hiatus. Suggest to delete the diagram and restrict the point to the text which seems very appropriate. [Jochen Harnisch, Germany]	caption has been revised to clarify. Note that figure discusses period 1951 to 2010 and hence the contrinbution by variability is smaller than that to a shorter period, see now added text on recent trends
SPM	10	1	10	1	This is probably the only figure that could be made smaller. This could be a key figure, maybe worth mentioning straight out in the intro, that shows global warming is anthropogenic. This is the basis for all the policies to decrease emissions. [Government of United States of America]	noted
SPM	10	1	10	1	Did I understand correctly that anthropogenic GHG and "other anthropogenic forcings" cancel each other, thereby reducing the uncertainty of "combined anthropogenic forcings"? If that's the case I think it might be good to say that explicitly and explain why this is so. [Helmut Haberl, Austria]	accepted, caption has been revised
SPM	10	1	10	6	Figure SPM.4: This figure is better to remove.. [Government of Republic of Korea]	rejected, figure considered helpful by other reviewers (eg 1617)
SPM	10	1	10	7	In order to avoid confusion and misunderstanding, it would be useful to add a brief explanation from lines 13-17 on p. SYR-35 regarding the smaller error bar length for the contribution of the combined forcings than for the separate contribution from greenhouse gases and other antropogenic forcings. [Government of Japan]	caption has been improved
SPM	10	1	10	7	This is a very clear and very useful figure. [Government of Denmark]	noted, thanks

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	1	10	7	This figure has confused many since it appeared in the WG1 SPM. The element in question is the smaller error bar for the 'combined' versus a counterintuitive large uncertainty bar for the 'greenhouse gas' (by the way, insert 'well-mixed' before 'greenhouse gas' to avoid misleading impressions). I realize why this is so, and this is explained in the figure caption that follows in the underlying text, but it would be corrective to add a sentence here clarifying the point. All in all, this is a difficult figure. [Venkatachalam Ramaswamy, United States of America]	caption has been improved
SPM	10	1	10	9	Figure and caption need to be clearer [Government of Ireland]	caption has been improved
SPM	10	1	10	17	Conclusions of observed attributions are very strong. Nevertheless, the uncertainty range is 5-95%. Please explain/clarify this. Same in page 35 (same topic). [Government of Chile]	rejected, bars give 'likely' ranges
SPM	10	1			Figure SPM 4 It is difficult to understand the mechanism of how the large uncertainties in GHG and Other anthropogenic forcings are reduced in the Combined bar in the figure. This needs explanation. [Government of Ireland]	caption has been improved
SPM	10	1			Figure SPM.4 is very important, but not easy to understand for non-experts. Please provide more explanation in the following text. [Government of Germany]	caption has been improved
SPM	10	2	10	4	Figure SPM.4 caption. Suggest the wording could be improved a bit here to help non-specialists understand the figure. A suggestion for an opening sentence for the caption might be "A decomposition of the observed trend in global mean surface temperature for 1951-2010 (black, with 5-95% uncertainty range shown as whiskers) into contributions due to external forcing (colours) and natural internal variability. ..." [Government of Canada]	caption has been improved
SPM	10	2	10	4	For a better understanding of "other anthropogenic forcings" please add "Other Anthropogenic forcings include aerosol, land-use albedo and ozone changes." (SYR p.35 l.6-7). Please add "anthropogenic" to "Greenhouse gases" labelling the green bar. [Government of Germany]	rejected, too much detail here ; current phrasing clearer than proposal
SPM	10	2	10	7	are the bars at 1 sigma or 2 sigma level? [Government of Sweden]	as explained, 'likely' ranges
SPM	10	2	10	7	Reference to Figure SYR 1.2, should be Figure 1.2. For clarification, change last sentence of caption into: "The attributed ranges of the different forcing (colours) are based on estimating the contribution to observed warming by fingerprints for external forcing derived from climate model simulations." [Government of Netherlands]	caption has been improved
SPM	10	2	10	7	In Figure SPM.4, the mid-point of the internal variability should be given. [Zong-Ci Zhao, China]	the mid-point is zero
SPM	10	2	10	7	The SPM.4 figure is modify from its original in Working Group I, we think it is more easy to read and shows the information on attributed contributions the figure SPM.5 on the of the SPM Working Group I. [Government of Venezuela]	noted
SPM	10	3	10	3	Include in the caption that [Combined anthropogenic forcings = greenhouse gases + Other Anthropogenic forcings] [Government of Netherlands]	caption has been improved

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	3	10	3	Include in brackets after "Other Anthropogenic forcings" what does this bar include, so the description to this, present in the caption of Figure 1.2 from chapter 1.3.1 of SYR, lines 6-7: "include aerosol, land-use albedo and ozone changes" [Government of Netherlands]	caption has been improved to clarify
SPM	10	3	10	3	Figure SPM4: What does "the other anthropogenic forcings" mean precisely? Aerosols?; The internal variability is too small (+0.1 C) even for global results. Or is it the variability of the whole 60 years? Variability from a linear climate change trend? This should be explained more. [Government of Hungary]	caption has been improved
SPM	10	3			Would be good to give an indication what some of these "other anthropogenic forcings" are e.g. Aerosols [Joanna House, United Kingdom of Great Britain & Northern Ireland]	caption has been improved to clarify
SPM	10	4	10	4	Describe somewhere in this caption what is included in "natural forcings": apparently they refer to solar irradiance changes and volcanic aerosols (WGI, chapter 10, page 883, so, if this is it, describe it in the caption. [Government of Netherlands]	caption has been improved
SPM	10	4	10	4	Delete the internal variability bar (as it has no signal only a range) or give a good explanation somewhere in this caption about what is meant by "internal climate variability" [Government of Netherlands]	caption has been improved to clarify
SPM	10	4	10	4	What is meant by "likely" ranges? 10%-90%? [European Union]	see IPCC uncertainty language, rejected
SPM	10	5	10	7	"These attributed ranges (colours) are based on estimating the contribution to observed warming by fingerprints for external forcing derived from climate model simulations." What is meant by "fingerprints?" At present, this is a confusing sentence for non-experts, but by clarifying this term it might become much clearer. [Government of Germany]	caption has been improved
SPM	10	6	10	6	The text from the end of figure 1.2 caption need be added here or elsewhere in the SPM Section on D&A. This is crucial information to understand the quantitative results and uncertainties: "Error bars are larger when greenhouse gases and other anthropogenic forcing is estimated separately compared to when they are estimated in combination (grey shading). This is because uncertainty in warming attributable to greenhouse gases is correlated with that in cooling attributable to aerosols. Hence while uncertainty is small in the overall anthropogenic contribution, there is uncertainty in how much greenhouse warming is offset by aerosol cooling" See SYR page 35 lines 13 to 17 [Thomas Stocker/ WGI TSU, Switzerland]	caption has been improved,
SPM	10	6	10	6	It is not clear what is meant by "fingerprints for external forcing", turning this sentence incomprehensible. Clarify this sentence in a way that a non-expert can understand it. [Government of Netherlands]	caption has been improved
SPM	10	6	10	6	How many model simulations should be provided? [Zong-Ci Zhao, China]	detail see figure source in WGI report
SPM	10	6	10	7	(Figure SYR 1.2) should be {figure 1.2} i.e. no SYR and braces instead of parenthesis [Thomas Stocker/ WGI TSU, Switzerland]	fixed

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	6	10	7	Figure SPM.4 caption: Suggest the phrase "by fingerprints for external forcing derived from climate model simulations" will not be understood by many readers. Avoid use of technical jargon where possible in the SPM. One suggestion would be to delete the sentence beginning with "These attributed ranges". Explanation of the method can be found in the underlying SYR or in the WGI report. [Government of Canada]	caption has been improved
SPM	10	9	10	11	Seems to me a mistake to omit the "best estimate of the human contribution to warming is similar to the observed warming over this period" sentence. Some policy makers when reviewing WGI SPM seemed to think that the extremely likely more than half without the contextualising best estimate information could be misleading. [Peter Stott, United Kingdom of Great Britain & Northern Ireland]	constraints on length prohibited more detail, also this can be seen in figure
SPM	10	9	10	11	The sentence beginning with "It is extremely likely that more than half of the observed increases..." may be confusing to the reader as it currently stands and could increase the perception that there is greater uncertainty about what is causing warming than is actually the case. Suggest explaining further and including also the sentence from the WGI SPM, which states "The best estimate of the human-induced contribution to warming is similar to the observed warming over this period." This will help the reader to better related these findings to Figure SPM.4. [Government of Canada]	text revised
SPM	10	9	10	11	This sentence is not very clear and the figure SPM4 doesn't helps to understand the idea. Anyway the phrase "more than half of the temperature increase is due to increased GHG Gase" seems to be very imprecise, the value is close to 1 or 0.5? And how could be explained the other half of the temperature increase ? [Government of Chile]	based on approved WGI SPM
SPM	10	9	10	11	Even regarding the figure it is way "more than a half" contribution of GHG and other AF, should be changed to "almost all". [Government of Hungary]	rejected, text based on approved WGI SPM
SPM	10	9	10	16	Anthropogenic influences are sometime referred to as "human influences", it may be worth checking this and using the same terminology throughout the text to avoid creating confusion among some readers... [Government of United Kingdom of Great Britain & Northern Ireland]	present text based on approved WGI report
SPM	10	9	10	17	Should this paragraph follow the bold statement on the previous page? [Government of Norway]	text has been revised
SPM	10	9	10	17	The key information that the best estimate is that climate change accounts for all the observed warming is missing here. [European Union]	best estimate can be seen in figure
SPM	10	9	10	17	The use of the terms "Anthropogenic influences" and "Human influences" in the same paragraph might be confusing to a reader. If we mean the same we better be consistent. We are also proposing to use the term "Anthropogenic warming" since it will fit well with Arctic sea ice loss since 1979 [Government of United Republic of Tanzania]	text based on approved WGI report

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	9	10	17	The paragraph indicates various starting dates (1960s, 1970s, 1979, 1993). While this is probably due to the dates used in the underlying studies, it raises questions here to why these dates: are they really the start of the elements mentioned, or are they dates since when we have data describing the element... [Government of France]	rejected, detail on available records and selection of reliable observational coverage see body of WGI report
SPM	10	9	10	18	This para on attribution should be moved to P 6. [Government of Germany]	structure has been improved
SPM	10	9			anthropogenic responsibility not clearly presented [Government of Netherlands]	text has been revised, but is based on WGI report
SPM	10	10	10	10	Please consider to replace "was" with "has been". [Government of Norway]	text has been revised
SPM	10	11	10	11	Regarding the term: anthropogenic forcings, for some one who reads the assessment report it is not clear at all. Some additional information would be very helpful. [Nedal Katbeh-Bader, Other - Palestine]	text has been revised
SPM	10	11	10	12	The sentence is ambiguous about why Antarctica is an exception. Assuming the reasons cannot be gone into here, it might be preferred to rephrase this conclusion to say "It can be stated for every continental region except Antarctica that anthropogenic forcings have likely make a substantial contribution...etc." This phrasing makes it clearer that it is the precise formulation of likelihood and surface temperature increases and time period that does not hold true for Antarctica, not that there is no evidence of a human influence on Arctic surface temperatures. [Government of Canada]	footnote has been added to clarify
SPM	10	11			Please add the information that attribution in Antarctica is not possible due to the lack of data. [Government of Germany]	added as footnote
SPM	10	11			• SPM [P10 L11] Add The observed reduction in surface warming trend over the period 1998 to 2012 as compared to the period 1951 to 2012, is due in roughly equal measure to a reduced trend in radiative forcing and a cooling contribution from natural internal variability, which includes a possible redistribution of heat within the ocean (medium confidence). There may also be a contribution from forcing inadequacies and, in some models, an overestimate of the response to increasing greenhouse gas and other anthropogenic forcing (dominated by the effects of aerosols). From WGI SPM page 15, bullet 2 [Government of Saudi Arabia]	discussion of recent trends have been added to text (above here)
SPM	10	12	10	19	The material on impacts can be synthesised in a more concise manner. [Government of Ireland]	
SPM	10	12	10	19	The RCP concept may be clearer if the units for the numbers were provide 8.6Wm-2 [Government of Ireland]	
SPM	10	13	10	13	Since the issue of Antarctic temperature changes has been raised, it should be dealt with more completely. I.e. say that warming is observed but cannot at this point be attributed to human activities. [Government of United States of America]	footnote added

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	13	10	14	It is better to change '..since 1960' to '... since the 1960s.' It is hardly possible that the anthropogenic influences suddenly became substantial starting at exactly 1960. [Government of Switzerland]	based on approved WGI SPM
SPM	10	15	10	15	"It is very likely" is it really so? Or is it "extremely likely?" [Government of India]	assessment from WGI report
SPM	10	15	10	16	Figure SPM.4: This figure is interesting but difficult to understand. The sentence "his is because uncertainty in warming attributable to greenhouse gases is correlated" does not seems clear to us : is it the uncertainty that is correlated (as written), or the contribution to the global temperature change ? Is it correlation in time and/or space and/or in a model ensemble ? (it would seem a bit counter intuitive to say that GHGs and aerosols forcings are correlated, as at least volcanos eruptions are not correlated with GHG concentrations ?) [Government of Belgium]	caption has been improved
SPM	10	16	10	17	Replace 'global upper ocean heat content (0–700 m)' with 'global upper ocean (0–700 m) heat content' (likewise on page 41, line 27) [Government of Switzerland]	rejected
SPM	10	17	10	17	{1.4} could be refined to 1.4.1 [Thomas Stocker/ WGI TSU, Switzerland]	accepted
SPM	10	17	10	17	The Authors should consider noting here that the heating of the ocean is responsible for half of the oberseved rate of Sea Level Rise today. [Government of United States of America]	see ocean section earlier
SPM	10	17			• SPM [P10 L17] Add There is low confidence in the scientific understanding of the small observed increase in Antarctic sea ice extent due to the incomplete and competing scientific explanations for the causes of change and low confidence in estimates of natural internal variability in that region. From WG1 SPM page 19 [Government of Saudi Arabia]	see topic1 text
SPM	10	20	10	20	Part 2 of the SPM: to illustrate the impact of climate change on natural and consequently also for human systems, a figure on food production could be included. Could combine marine and terrestrial food production losses by using the globe on fishery catch potential from figure SYR 2.7 and the crop yield bars from figure SYR 2.8 [Lena Menzel, Germany]	Agreed. The new Figure SYR SPM.9 covers both aspects mentioned by the reviewer: risks for marine and terrestrial food production.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	20	11	15	<p>Current term "land-use patterns" gave a vague figure about the effects of Land Use and Land Use Change on the GHG emission and removal. For example, carbon equivalent forests in the forest management, perhaps no GHG emission or removal change, but land use pattern certainly had been changed. "Land-use Pattern" should be replaced with "Land Use and Land Use Change"?</p> <p>Both title "Anthropogenic greenhouse gas emissions are mainly determined by population size, economic activity, energy use, land-use patterns, technology change and climate policy {2.1}. Livelihoods, lifestyles and behaviors also have significant influences on GHG emissions trajectories. {4.2} " and the first sentence of text body of the paragraph are from the work of working-group two, however, the title is very hard being inferred from the text body which is mainly talking about the climate change policy, unless you have much knowledge about what relations exist between GHG emission and social factors, such as population size, economic activity, energy use, land use and son on. Anyway, please keep in mind that your Syr shall mainly serve to the policy makers and general readers, you cannot force all your readers have that kind of knowledge sufficient to do that inference. To improve the readability of that paragraph, perhaps it is better to revise either the current title or text body, making the former be directly inferred from and supported by the later. [CHENGYI ZHANG, CHINA]</p>	<p>This is not a title. It is a key statement. The statement has now been simplified to:</p> <p>"Anthropogenic greenhouse gas emissions are mainly determined by population size, economic activity, lifestyle, energy use, land-use patterns, technology change and climate policy {2.1, 4.2}. "</p> <p>Notice that "change" has replaced "pattern" as suggested.</p>
SPM	10	20	15	28	<p>It would be noted that projected changes are for 2081-2100 relative to 1986-2005 unless otherwise indicated, as stated in p53 L25. [Government of Japan]</p>	<p>Reference periods are now given.</p>
SPM	10	20	15	28	<p>Suggest considering whether information on projected changes and their likelihood can be presented in a more integrated way (e.g., table format). [Government of Canada]</p>	<p>We have considered many options and believe we have settled on the best. Some of the information is give as text, some in Tables and some as graphics. No single presentation method is best.</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	20	15	28	<p>This feels very like a list of things that could happen. The reader will be non-expert and likely want to understand what a 2C or 4C warmer world would look like. For a large number of people, the only part of the SYR that they read could be the SPM. On this basis, it would be more user-orientated if the summary grouped together impacts describing e.g. a 2C warmer world, then a 4C warmer world, highlighting the contrasts/similarities. At present, it jumps around and is hard for non-expert readers to follow. [Government of United Kingdom of Great Britain & Northern Ireland]</p>	<p>Please note that the key risk map and sectoral key risk table present assessments for 2 and 4°C. In the Synthesis Report we also provide a Table which links cumulative CO2 emissions to particular warming thresholds. Space precludes us from presenting this in the SPM. We recognise the benefits of this approach. However, reorganization of Topic 2 beyond this is not possible because there is insufficient additional information pertaining to 2°C and 4°C warming in the underlying reports. Interpolating what is present to these thresholds without a clear basis in the literature goes beyond the function of a Synthesis Report.</p>
SPM	10	20	15	28	<p>The chapter on "future climate changes, risks and impacts" also lacks a clear structure as there is no distinction between the time short and medium und long term. This distinction is helpful because in the shoprt and medium term climate change risks cannot be changed by mitigation of GHG emissions any more but only by adaptation whereas in the long-term mitigation of GHG emissions can signifiocantly contribute to control climate change risks. It is strongly suggested to have three subsections in this chapter: one on emissions in the 21st century, one on climate change risks in the short and medium term and one on climate change risks in the long-term. [Government of Austria]</p>	<p>The structure has been improved by the insertion of a very breif introduction and sections 2.1 - 2.4. . A statement on near-term climate change is provided. The point re the importance of scenarios increasing in time is also made. There is not enough high level information suitable for a Synthesis Report for Policymakers on near-term climate to warrant restructure of this kind. The Topic concludes with a section that deals with longer-term changes.</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	20	15	30	Different to previous section, this one is perceived as very well and eloquently written. It is easy to follow and to link paragraph after paragraph. However, what it is missing is the important insight gained in WG2 B2 section in terms on economic impacts of climate change. It is suggested that somewhere in this section the following is added: "Global economic impacts from climate change are difficult to estimate. Economic impact estimates completed over the past 20 years vary in their coverage of subsets of economic sectors and depend on a large number of assumptions, and many estimates do not account for catastrophic changes, tipping points, and many other factors. With these recognized limitations, the incomplete estimates of global annual economic losses for additional temperature increases of ~2°C are between 0.2 and 2.0% of income (medium evidence, medium agreement). Losses are more likely than not to be greater, rather than smaller, than this range (limited evidence, high agreement). Additionally, there are large differences between and within countries. Losses accelerate with greater warming (limited evidence, high agreement)." [Tabaré Arroyo Currás, Mexico]	Thank you! Regarding the second part of this comment: Agreed. This text is now reflected in Topic 2, 2.3, Topic 3, and also the Article 2 Box, in different forms.
SPM	10	20			Section 2: There is nothing in Section 2 (Future climate changes, risks and impacts) about ocean acidification. This is an important topic of concern. Suggest information should be added. [Government of Canada]	Agreed. Information on acidification now provided. E.g. headline statement in Section 2.2 says: "Surface air temperature is projected to rise over the 21st century under all assessed emission scenarios. The ocean will continue to warm, acidify and lose oxygen. Global mean sea level will continue to rise during the 21st century and beyond. {2.2}"
SPM	10	20			Section 2: The message "Continued emissions of greenhouse gases will cause further warming" is very important and needs to be better underpinned by structured arguments in the text of section 2, including a clear explanation of the role of models and scenarios. [Government of Belgium]	Given tight space restrictions and the nature of the Synthesis Report SPM, we decided that it is best to get quickly to the projections with minimal discussion of methods and models in the SPM. We also have, however, inserted the following sentence in SPM 2.1 to address this issue: Note that the Synthesis Report provides two new boxes Box 2.1 and Box 2.2, which now describe models and methods.
SPM	10	21	10	24	How long is long-lasting changes? We suggest to use "irreversible changes" [Government of United Republic of Tanzania]	True, taken in isolation it is ambiguous. However, this is a headline statement and given the context of the report, i.e., long-term climate change, we believe it is appropriate. Specific periods are given in text below.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	22	10	24	This statement should reflect the assessments in the chapter that are key from a policy-maker perspective, i.e. information provided in page 13 line 27-36, page 61 line 12-14, and on page 65 line 25-26 and 49-51. Rationale: The most severe impacts or risks to human and natural systems resulting from climate change should be reflected in this headline statement. [Government of Norway]	Agreed. A revised headline statement is now provided: "Continued emissions of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system. Substantial and sustained reductions of greenhouse gas emissions will be required to limit climate change and the associated risks for people and ecosystems."
SPM	10	22	10	24	Please add the information that larger warming means higher risks. E.g. insert the sentence from WG2 SPM, P 14: "Increasing magnitudes of warming increase the likelihood of severe, pervasive, and irreversible impacts." [Government of Germany]	Agreed. A revised headline statement is now provided: "Continued emissions of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems". In addition, the following headline statement is provided in Section 2.4: "Many aspects of climate change and associated impacts will continue for centuries. The risk of large-scale, abrupt and irreversible changes increases with larger warming. "
SPM	10	22	10	24	In the sentence 'Limiting climate change and associated risks to people and ecosystems will require substantial and sustained reductions of greenhouse gases emissions', the position of 'people' in front of 'ecosystems' is fairly wise. However, the sentence should also mention 'adaption'. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Adaptation is dealt with in Section 2.3. For example, paragraph 2 says: "Adaptation has the potential to reduce climate change impacts significantly, but its potential differs among and between natural and human systems and there are constraints and limits to adaptation (Figure SPM.7). {2.5, 3.3} xx A sentence has also been added to the headline statement in Section 2.3 to give: Climate change will create new risks for natural and human systems and amplify existing risks. Risks tend to increase under higher emissions, even after the potential for adaptation is taken into account. xx tbc. i entered this sentence but needss approval from bob.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	22		24	RETAIN: "Continued emissions of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system. Limiting climate change and associated risks to people and ecosystems will require [ADD:] RAPID substantial and sustained reductions of greenhouse gases emissions, with CO2 reduced to zero emissions." ADD: Emergency. [Peter Carter, Canada]	A revised headline statement is now provided: "Continued emissions of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems". In addition, the following headline statement is provided in Section 2.4. "Many aspects of climate change and associated impacts will continue for centuries. The risk of large-scale, abrupt and irreversible changes increases with larger warming." Rates of greenhouse gas reductions are considered in Topics 3 and 4.
SPM	10	23			to add mainly developed countries and with commitment to reducing emissions and provision of financial resources to support adaptation in developing countries. [Government of Nicaragua]	The focus of topic 2, as summarized in this SPM section, is on future climate change and on future risks and impacts. As part of the treatment of future climate change, cumulative emissions are considered, and this statement about limiting climate change is made on that basis. Topics 3 and 4, as summarized in the later SPM sections 3 and 4, consider international policy, financial transfer, differential responsibilities, and the important interactions among mitigation, adaptation, and sustainable development. Analysis of the distribution of emissions and implications for financing both adaptation and mitigation thus must occur in those later sections, with the statement here focusing on the physical science of climate change and what that means for understanding of cumulative emissions and future climate change.
SPM	10	24			• SPM [P 10 L 24] Add substantial enhancement of sinks of greenhouse gases. From WGI SPM page 19, page 3 last para [Government of Saudi Arabia]	CDR geo-engineering methods is now addressed in a new box on Geo-Engineering (Box 3.3)

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	25	10	25	At the beginning of chapter 2, please specify which time period the temperature projections are compared to. E.g. similar to the sentence in the caption to Figure SPM.5 if this also is correct for the changes given in text (Temperature changes/values are always given relative to the 1861-1880 period, and emissions are cumulative since 1870). [Government of Norway]	We have endeavoured to minimise differences between references periods used. However, we cannot provide a single reference period here because reference periods vary in the subsequent text. This variation is needed to meet different needs. For example, there is an historical core period in WGI, but policymakers also want information relative to earlier periods. Similarly there is a late 21st century WGI reference period, but policymakers also want information on other periods during the 21st century.
SPM	10	25	10	25	At the beginning of chapter 2, please specify which time period the temperature projections are compared to. E.g. similar to the sentence in the caption to Figure SPM.5 if this also is correct for the changes given in text (Temperature changes/values are always given relative to the 1861-1880 period, and emissions are cumulative since 1870). [Government of Norway]	No single reference periods for projections can be given for the entire SYR. The Reference period for climate projections is specified at the beginning of Section 2.2. as 1986-2005.
SPM	10	26	10	26	to delete the words: (population size). [Nedal Katbeh-Bader, Other - Palestine]	Rejected. Population growth leads to higher GHG emissions..
SPM	10	26	10	27	The factors that "determine" GHG emissions mix drivers (population, economic activity); sources (energy, land use); and potential mitigation solutions (technology, policy). These "determine" GHG emissions in different ways, and should be separated. In particular, the larger contribution from economic growth should be highlighted, consistent with the WGIII SPM, which stated with high confidence that "The contribution of population growth between 2000 and 2010 remained roughly identical to the previous three decades, while the contribution of economic growth has risen sharply". The finding that the growth in the affluent part of population is driving emissions growth, not population per se, should be highlighted. [Government of South Africa]	A full discussion will be later in the SYR. Here we just list the factors. We have, however, changed the wording.
SPM	10	26	10	27	This sentence is a statement of a static situation, not a development, eg expressions "population size,, economic activity, energy use. The expression "technology change" however is a dynamic one which would fit together with "Development of anthropogenic greenhouse gas emissions....". To be consistent with "Anthropogenic greenhouse gas emissions..." I suggest to substitute "technology change" with "kind of technology" or "type of technology". A country with mainly hydropower electricity will have another level of GHGs than a country with electricity from coal. [Harold Leffertstra, Norway]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	As this statement is on "greenhouse gas emissions", not changes therein, we think the following needs to list "technology", not "technology change". [Government of Netherlands]	We have changed the wording to provide one list of drivers.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	26	10	28	It would be logical if this conclusion addresses trends consistent with the SPM of WGIII rather than the absolute emissions. In that case the trend is dominated by economic activity and not population growth. [Government of Netherlands]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	To improve readability you should consider to merge these two sentences together and slightly reformulate the last part so that it reads "..... climate policy, but livelihoods, lifestyles and behaviours will also significantly influence the GHG emissions trajectories {2.1, 4.2}" [Government of Norway]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	Together, these two sentences read as though these factors are entirely independent of each other. Consider revising to mention how energy source and the carbon intensity of that source will influence emissions. Note also that, in general, lists of factors like these are often not helpful in the SPM due to interest in representing many different circumstances. [Government of Canada]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	This para should be put into future tense, or moved to the previous section. [Government of Germany]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	The social/economical behaviors, livelihoods and lifestyles have the major influence on GHG emissions trajectories. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	Need to be consistent between "greenhouse gas emissions" and "GHG emissions". Also, remove the word trajectories at the end of paragraph. [Government of United Kingdom of Great Britain & Northern Ireland]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	I think consumption and production need to be mentioned here, as they are important drivers not fully captured in "livelihoods" and "lifestyles" and "behaviours". [Helmut Haberl, Austria]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	28	This sentence mixes information on mean and trends and therefore needs to be clearer. 'Technology change and climate policy' influence trends, but the beginning of the sentence is true for both means and trends. The second sentence has the same problem. 'Livelihoods, lifestyles and behaviors' all influence the mean emissions, but they are presented for the trajectories. [European Union]	We have changed the wording to provide one list of drivers.
SPM	10	26	10	31	I would start with "The "Representative.... Different futures {2.1}." Then insert the previous section (line 26 til 28). This makes the section more coherent. [Government of Netherlands]	The section was reorganized
SPM	10	26	15	28	We think subheadings will clarify the structure, and we suggest the following titles for those: 2.1 Cumulative CO2 emissions (from p.10, l.26); 2.2 Warming the atmosphere, oceans and cryosphere (from p.11, l. 28); 2.3 Increased risks of increased warming (from p.13, l.20); 2.4 Long-term effects of climate change (from p.15, l. 1) [Government of Netherlands]	Subheadings are in the SPM now
SPM	10	27	10	27	Not only "technology CHANGE", but also technology, which is in use (cf. e.g. "energy use" in the same section). [Government of Sweden]	Agree. Changed

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	27	10	27	to change the words (technology change) to (Technology use) . [Nedal Katbeh-Bader, Other - Palestine]	Agree. Changed
SPM	10	27	10	27	Please exchange "technology change" with "technology use". [Government of Germany]	Agree. Changed
SPM	10	27	10	27	Here anthropogenic emissions are attributed among other causes to "technology change", I think this statement in itself can be misleading because technology change is also one of the fundamental prerequisites to achieve emissions reductions. It may be worth considering to rephrase by saying "use of carbon intensive technologies" or something similar... [Government of United Kingdom of Great Britain & Northern Ireland]	Agree. Changed
SPM	10	27	10	27	Write: "... technology change and investment and climate policies..." [Government of Switzerland]	Agree. Changed
SPM	10	27	10	27	Consider inserting "migration patterns" after "land-use patterns." While land-use patterns can be construed to include migratory behavior, typically the term denotes more localized infrastructure change (e.g., seawalls, dikes, strategic retreat) rather than changes in long distance population movements. [Carl Southwell, United States of America]	Rejected. Word constrained
SPM	10	27	10	27	Consider inserting "beliefs and other cultural behaviors" after "Livelihoods." While behaviors can be construed to include beliefs, typically the term belief denotes broad, generally long-term group ritual and tradition more than shorter-term individual and small group conduct and reaction. [Carl Southwell, United States of America]	Sentence was somewhat reformulated - but there is also word constrained
SPM	10	27	10	28	To become consistent with the dynamic end of the sentence "...on GHG emissions trajectories." I would suggest to insert "Changes in" before "Livelihoods,.....The sentence would thus read "Changes in livelihoods, lifestyles and behaviors also have significant influences on GHG emissions trajectories." [Harold Leffertstra, Norway]	Agree. Changed
SPM	10	27	27	10	"..energy use,landuse patterns..." should not this be Fossil energy use? Energy use per se cannot be GHG emitting. In the same sentence instead of "technology change" may be more appropriate is status of technological advancement/progress. [Government of India]	Agree. Changed
SPM	10	27			Insert Monetary Policy [Michael Casey, Ireland]	Rejected. A selection of key drivers was made.
SPM	10	28	10	28	In 4.2 (page 94, lines 6ff) it is written : "Behavior, lifestyle and culture have considerable influence on energy use and associated GHG emissions and the vulnerability of human and natural systems to climate change (high agreement, medium evidence)". Therefore (high agreement, medium evidence) should be added here in the SPM [Thomas Stocker/ WGI TSU, Switzerland]	Tekst was merged with preceeding sentence.
SPM	10	30	10	30	"RCPs" is abbreviation so it would be preferred to describe as "(RCPs)" rather than " , or RCPs". [Government of Japan]	Section was rewritten
SPM	10	30	10	30	Instead of "describe" write "project". [Government of Switzerland]	Like word describe better

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	30	11	3	We support including this the description of the RCPs. [Government of New Zealand]	Thanks
SPM	10	30	11	3	This is a very useful paragraph. [Government of Denmark]	Thanks
SPM	10	30	11	3	Please add the information that the current emission trajectory is close to the RCP8.5. It would also be good to label the four scenarios for lay persons (like e.g. ambitious mitigation or business as usual scenario) [Government of Germany]	Rejected. Consider short-term trends for long-term scenarios not so relevant. Doing this properly would require too much tekst.
SPM	10	30	11	3	This interpretation of the RCP scenarios is surprising. Please provide a factual introduction to the reasons for using those scenarios and what they represent. We suggest using material from the box on RCPs in the WGI SPM, in particular : " These four RCPs include one mitigation scenario leading to a very low forcing level (RCP2.6), two stabilization scenarios (RCP4.5 and RCP6), and one scenario with very high greenhouse gas emissions (RCP8.5). The RCPs can thus represent a range of 21st century climate policies" [Government of Belgium]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	30	11	3	The discussion of RCPs could be simplified so that they are easier for non-experts to understand. Whilst scientists may use RCP for modelling, policy makers and politicians use/understand temperature rises for decision making. It would be useful for non-experts if the expected warming range for each RCP was explicitly set out here and what they meant in global response terms. The information is in the document, but it is hard to find. Linking RCP2.6 to 2°C warming (regardless of the confidence level) helpfully illustrates the level of mitigation ambition and warming expected, contextualising the RCP. This is lacking for other RCPs in the summary section and should be added, to make the statements more useful to decision makers. e.g. RCP8.5 represents a high emission scenario with no climate mitigation policies WHERE WARMING OF 3.7 to 4.8 °C COULD BE EXPECTED; RCP6.0 represents.....WHERE WARMING OF C to D °C COULD BE EXPECTED... [Government of United Kingdom of Great Britain & Northern Ireland]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	30	11	3	Simple descriptions are being developed for the scenarios, and this is good. The names for RCP6.0 "middle-of-the-road" and RCP4.5 "medium mitigation" sound a bit too much alike. [Government of Finland]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	30	11	3	SPM is meant for Policymakers (PMs), however, from this brief summary it will be unclear for them why RCP refers to "concentration" and why the four pathways are labelled by those numbers (8.5, 6.0, 4.5, 2.6): so, the minimum explanation would be useful in this regard (in the text or in a footnote). [Government of Hungary]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	30	11	15	Is it possible to state to which RCPs are the emissions trend during 2000 - 2010 [Government of India]	Rejected. We don't think it is very relevant to compare LT scenarios to short-term emission trends

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	30			This need to be reformulated to make clear that these are potential development and scenarios of possible futures. Consider whether the whole RCP discussion should be moved to page 15 [Government of Sweden]	The introduction of the RCP has been changed. We think it reads more logical now.
SPM	10	30			The RCP are describe to deterministically. Proposed solution: "... Describe a possible range over the 21st century..." [Government of Sweden]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	30			Stress the "non-probabilistic" interpretation of the RCP, i.e. RCP4.5 and 6 should not be interpreted as more probable than 2.6 and 8.5. Important from a policy-perspective. [Government of Sweden]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	31	10	31	to change the words (air pollutants) to (Green House Gases) . [Nedal Katbeh-Bader, Other - Palestine]	Here air pollutants were meant.
SPM	10	31	10	31	The authors should consider removing "very" from this sentence. [Government of United States of America]	We have changed the wording to provide one list of drivers.
SPM	10	32	10	32	place line of cite {2.1} at the end of the paragraph, unless within paragraph references are used throughout the SPM [Thomas Stocker/ WGI TSU, Switzerland]	We have changed the wording to provide one list of drivers.
SPM	10	32	10	32	would benefit from adding after "...no climate mitigation policies" something like "(business as usual' or baseline scenario)" [Jonathan Lynn, Switzerland]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	32	10	32	Please consider to include "new additional" before "climate mitigation". [Government of Norway]	Reject. No change was made.
SPM	10	32	11	1	RCPs are scenario analysis to show emission trajectory pathways and do not define the specific climate policies to be adopted in order to realize the pathways. Based on this view, explaining RCP6.0 as "with very modest or no climate policies" could be misleading to policy makers regarding the evaluation of the information come out of the RCPs. We would like to recommend rewriting this part as written in WG1 SPM BOX.1, "mitigation scenario leading to a very low forcing level (RCP2.6), two stabilization scenarios (RCP4.5 and RCP6), and one scenario with very high greenhouse gas emissions (RCP8.5)." Or for the explanation of RCP8.5 and 6.0, other descriptions maybe useful such as "The baseline scenarios collected for this assessment (scenarios without additional efforts to constrain emissions) is similar to the range in atmospheric concentration levels between the RCP6.0 and RCP8.5 pathways in 2100." (WG3 Chapter 6 ES) [Government of Japan]	We have decided to stay closer to the wording in WG1 SPM
SPM	10	32	11	3	We do not think "agressive" is a useful determinant for a mitigation scenario and suggest to rephrase to: "... while RCP2.6 represents mitigation scenarios which aim to keep global warming below 2°C above pre-industrial temperatures (Figure SPM.5)." [Government of Netherlands]	We have decided to stay closer to the wording in WG1 SPM

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10	32	11	3	In some cases, the RCPs are described as representing a single scenario (i.e., 8.5) whereas others are described as representing multiple scenarios. Suggest revising use a consistent way of describing all RCPs. [Government of Canada]	Sometimes specific RCPs are highlighted
SPM	10	39	11	1	This is not a correct description for RCPs. RCPs do not define with/without climate mitigation policies. The collected scenarios without climate mitigation policies (baseline scenarios) for the AR5 correspond to just around between RCP8.5 and RCP6.0. (Revise to ,for example, "The baseline scenarios collected for this assessment (scenarios without additional efforts to constrain emissions) is similar to the range in atmospheric concentration levels between the RCP6.0 and RCP8.5 pathways in 2100." which is described in Chapter 6 ES of WG3) [Keigo Akimoto, Japan]	We have decided to stay closer to the wording in WG1 SPM
SPM	10		10		Describe which kinds of gases are included in the "Other Anthropogenic Forcings" in Figure SPM.4. [Keigo Akimoto, Japan]	Captions have been improved
SPM	10		10		Figure SPM 4, The figure caption needs to be worked at. The caption could start with the text of the figure title. The last sentence is very difficult to understand. [Government of Finland]	Agreed. Caption has been reworded.
SPM	10				This is a confusing figure. I think is more clear the figure 5 of WGI SPM, with the addition of a temperature scale axis. [Carlos Méndez, Venezuela]	Noted. No action
SPM	10				Figure SPM. 4. Suggest adding the gases included in the Anthropogenic forcing of Figure SPM.5 [Government of Japan]	Noted. No action
SPM	10				Figure SPM.4. Please be aware that the 60 year interval 1951 - 2010 used in Figure SPM.4 starts with a cold La Niña year and ends with a warm El Niño year. One alternative could be to state that the contribution from internal variability is most probably positive over this time interval. [Government of Norway]	Noted. This is part of the assessment in the underlying WGI Chapter 10. SYR figure and statements need to be fully consistent with the underlying report.
SPM	10				Figure SPM.4. This Figure is difficult to understand, especially when the top panel of the Figure SYR 1.2 is not included. Please consider removing or alternatively adding the full explanatory text for the bottom diagram in Figure SYR 1.2. [Government of Norway]	Noted. No action. In fact, while both panels from SYR FOD Figure 1.2 are still included in the SOD of SYR Topic 1, they have been split into to separate figures as the combination of RF since 1750 to D&A for the period 1951-2010 was considered confusing (and misleading) by the authors.
SPM	10				Figure SPM.4: Please consider adding a more comprehensive label for the x-axis, for example; "Temperature anomaly in 2010 relative to 1951 (°C)". [Government of Norway]	Noted. The Title of the figure has been updated to now read "Attributed contributions to observed warming" and we highlight the period considered (1951-2010) in the first sentence of the caption.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	10				Figure SPM.4. Why to prefer this Figure to Figure SPM.6 of WGI report (also Fig1.7 of this report) ? This one is not so clear to understand, in particular the larger error bars for each kind of anthropogenic forcing ("Greenhouse gases" and "other") compared to the smaller error bar for "combined anthropogenic forcings" (this is explained in the caption of Figure 1.2 of this report and more extensively in chapter 10 of WGI report, but this is not explained in the caption of Figure SPM.4). The Figure 1.7 can be more easily understood and contains more information (different regions, longer period, confrontation between model results and observations ...). [Serge PLANTON, France]	Noted. Additional explanations on the D&A methodology and the error bars have been included in the caption of now Figure SPM.3. While we appreciate the value of Figure 1.7, it conveys a different message from what we were trying to convey here on the individual contributions to the observed warming.
SPM	10				Fig SPM-4 is well chosen. Many fewer policymakers would understand the same message if it were presented in terms of radiative forcing. [Tony Weir, Australia]	Thanks.
SPM	10				• SPM [P10] Figure SPM 4 This figure is for the period 1951 to 2010. Warming was lower during the more recent period 1998 – 2010. This should be clearly indicated in this graph. [Government of Saudi Arabia]	Reject. This figure is about the detection and attribution of the observed warming to causes. The observed warming over the time periods mentioned by the reviewer are explicitly discussed in SPM Section 1.1 "Observed changes in the climate system"
SPM	10				Figure SPM.4 Error bars for 'greenhouse gases' and for 'other anthropogenic forcings' are much larger than the error bar for 'combined anthropogenic forcings' (which is the sum of these two components). The reason for this is explained on P35 in the legend of Figure 1.2 (but a note could be added also in the legend to Figure SPM4) [Government of France]	Accepted. This information is now also given in the caption of the SPM figure (now SPM.3)
SPM	10				Figure SPM.4. This is an important figure, but difficult to read and to understand rapidly. The point is that at first look it is difficult to understand that the error bar is larger for GHG than for combined anthropogenic forcing, because GHG is better known than the other forcings. Of course this is due to the detection/attribution methodology, but people not used to it could make erroneous conclusions. Redrawing this figure by making sure that it is easy to understand that the combined anthropogenic forcings is what is more easily detected and that the GHG and OA is a subproduct of the later, which explains the larger error bar, would help to better understand the result.. [Government of France]	Noted. Additional explanations on the D&A methodology and the error bars have been included in the caption of now Figure SPM.3
SPM	11	0	11	0	graph A: add horizontal line at zero Gt/yr [Government of Netherlands]	Agreed. Change was made
SPM	11	0	11	0	graph A: write Gt/yr or "per year" in stead of Gt yr ⁻¹ (for clarity) [Government of Netherlands]	Rejected. Against guidelines.
SPM	11	0	11	0	graph A: y axis range can be reduced to coincide with the range of WGIII scenarios (to use space more effectively) [Government of Netherlands]	Figure has been improved
SPM	11	0	11	0	graph B: add "1990" and "1970" to the appropriate black dots, for clarity [Government of Netherlands]	Figure has been improved
SPM	11	0	11	0	graph B: remove "anomaly" [Government of Netherlands]	Figure has been improved

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	1	11	1	Quality of figure SPM.5 should be improved, in particular figure b is of poor quality and difficult to read [Government of Argentina]	Figure has been improved
SPM	11	1	11	3	Linked to above it is to limit the global temperature increase to less than 2C etc [Government of Ireland]	Not clear what is meant here. No action
SPM	11	2	11	2	Suggest avoiding adjectives such as "aggressive" or ambitious when describing mitigation scenarios since these modifiers imply value judgments. The statement is as effective with "more aggressive" deleted. [Government of Canada]	Agreed. Sentence was reworded
SPM	11	2	11	2	Describing RCP2.6 as a "more aggressive" mitigation scenario seems like an overly mild characterization. WG3 makes it clear that scenarios close to RCP2.6 require an all-out societal effort as well as successful development and deployment of large-scale carbon dioxide removal. The authors should consider alternate language. [Government of United States of America]	Agreed. Sentence was reworded
SPM	11	2			Change 'more aggressive' to 'stronger', 'more intense', 'pronounced'. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Agreed. Sentence was reworded
SPM	11	3	11	3	It seem strange that Figure SPM.5 which apparently builds on Figure SPM 10 from WG I omitts the grey plume which was part of the original figure. Suggest to keep the grey plume in order to not be accused of trying to hide uncertainties. The addition of "data points" vis-à-vis the lines and plume(s) suggests that these are more accurate estimates. I wonder whether this is grounded in the underlying science assessments of WG I and WG III. Suggest to stick to the original WG I Figure SPM10. [Jochen Harnisch, Germany]	Grey plume inserted in the topic version of this figure. Omitted from SPM version for simplicity
SPM	11	3	11	3	Please consider to include a sentence that describes that the recent development in global emissions is closer to RCP8.5 than RCP2.6. And, if the authors think it is appropriate, that RCP8.5 can be viewed upon as a "business as usual" scenario. This would be a very informative and helpful finding for policymakers. [Government of Norway]	Recent short-term emission trends are not sufficient to define RCP8.5 as business as usual
SPM	11	3	11	4	Panel (b) contains a lot of detail, and could be larger. [Government of New Zealand]	Panel simplified
SPM	11	3	11	4	Figure SPM. 5 Figure panel B needs to be scaled to the page width in order to see the details and read the legend. In Panel A it would be helpful to include the category legend from Figure 2.1 (b). [Government of Denmark]	Simplified
SPM	11	3	11	5	Legend in Fig SPM5B is illegible [Helmut Haberl, Austria]	Figure has been revised and size increased.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	3			AFTER line 3 ADD: The RCP projections are under-estimates because amplifying carbon feedback emissions, e.g., increased forest fires (CO2) and thawing permafrost (CO2 and CH4), are not included in the AR5 RCP warming projections. (From WG I, TS, p. 14, E para 4: "The overall spread of projections for the high RCPs is narrower than for comparable scenarios used in AR4 because in contrast to the SRES emission scenarios used in AR4, the [...] carbon cycle uncertainties affecting atmospheric CO2 concentrations are not considered in the concentration driven CMIP5 simulations.") It is important to note that these are not uncertainties in the policy sense. They are policy-important certainties that increase with degree of warming and time. [Peter Carter, Canada]	This information added to the caption of the table in Topic 2.
SPM	11	3			after line 3, ADD: Based on the science and on risk, all projections must include results for an upper climate sensitivity of 4.5°C. RATIONALE: The RCP projections do not account for risk and may be under-estimates because they assume a single climate sensitivity of 3°C while the upper range of 4.5°C has been found most likely by many studies. 3°C is not the long-term equilibrium sensitivity because it does not include carbon feedbacks or slow feedbacks. The single sensitivity of 3°C is therefore not protective of future generations or future ecosystems. The SYR has greatly insufficient content on climate sensitivity. Based on the science and on risk, all projections must include results for an upper climate sensitivity of 4.5°C. The only climate sensitivity used in the SYR is 3°C, a fast-feedback-only sensitivity. The sensitivity could be as high as 6°C – "very unlikely" (SYR p. 58, line 8-9) (SYR p. 30, line 45: "0-10%" greater than 6°C). (Cont'd.) [Peter Carter, Canada]	Range of CMIP5 responses to RCP8.5 is provided in figure 5b and budget calculations, which extends to high sensitivities
SPM	11	3			(Cont'd). According to WG I, "An ECS greater than about 6°C-7°C" with up to a 10% chance "is now assessed to be very unlikely" (WG1 p. 48, line 38). The sensitivity is not static linear (as in SYR); it is dynamic, increasing with warming and time, and subject to abrupt increase. "On timescales of many centuries and longer, additional feedbacks with their own intrinsic timescales (e.g., vegetation, ice sheets) may become important but are not usually modelled in AOGCMs" (WG I, p. 48, line 50-51). "The equilibrium climate sensitivity (ECS) is likely (66%-100%) in the range 1.5°C-4.5°C" (p. 58, line 7-8). There is up to a 33% chance that the sensitivity is 4.5°C-6°C. This shows that the SYR is highly risk-tolerant, rather than risk-averse. [Peter Carter, Canada]	The statement that there is a 33% chance of ECS 4.5°C-6°C is a misreading of the WG1 conclusions. Risks of high responses are accounted for.
SPM	11	3			The reference to Figure SPM5 needs to be followed with 1 or 2 sentences explaining the modelling methodology used - that multiple runs were made using a hierarchy of models including CMIP (state what these are) and simpler models. Also explain "scenario categories" these are mentioned in the caption but not the text. [Government of United Kingdom of Great Britain & Northern Ireland]	This is detailed in the topic

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	4	11	4	Figure SPM.5 (b): This important panel should be presented clearly. Axis labels and legends need to be clearly readable. [Government of Japan]	Addressed
SPM	11	4	11	4	We suggest to reverse the order of the RCPs so it will be consistent with the order of the colored lines [Government of Netherlands]	RCPs now displayed in topic version only
SPM	11	4	11	4	Figure SPM5, Panel A: a legend for scenario categories would be appreciated, if readability of the graph does not loose. [Lena Menzel, Germany]	Figure has been simplified
SPM	11	4	11	4	Figure SPM5, Panel B: colors are not well to differentiate in this downscaled version of the figure. Please check for readability of the figure. [Lena Menzel, Germany]	Figure revised
SPM	11	4	11	4	Figure SPM .5 is too small. if A and B) can be used here, why not for other figures as well? Might be good to have a table or box that lists the RCPs so they can be easily referred to. [Government of United States of America]	Figure is simplified
SPM	11	4	11	4	SPM. 5b is unclear. It tries to convey too much information, and is very confusing as a result. Focus on the key pieces of information that need to be conveyed. Eliminate the rest. [Government of United States of America]	Figure is simplified
SPM	11	4	11	4	Figure SPM.5 Note: (B) needs a Larger Legend Box. [Government of United States of America]	Revised figure no longer requires inset legend
SPM	11	4	11	4	Figure SPM .5 axis labels are illegible at 100 percent scale. Axis labels should be at least as large as annotations. [Government of United States of America]	Figure revised
SPM	11	4	11	4	Figure SPM .5 plot titles in first sentence of caption are too complicated and not accurate summaries of the plots. Should be something like: a) Observed and predicted CO2 emissions between 1950 and 2100 for different RCPs and scenarios. b) Temperature anomaly increase with increased CO2 emissions. Axis labels too small and inset legends illegible. [Government of United States of America]	Figure and legends simplified
SPM	11	4	11	4	It is difficult to discern the red line from the orange line. Also, there are both red and green lines in there-- nearly a quarter of the male population has red-green colour weakness. [Government of United States of America]	Colours are standard across the reports
SPM	11	4	11	15	Fig SPM.5: How can RCPs be derived from CO2 only? It is clear that CO2 is the dominant gas, but the concentrations and implications for W/m-2 are due to all gases, are they not? The literature (e.g. Van Vuuren et al 2011) on RCPs has based RCP on other gases as well - why is only CO2 highlighted here? The implicit message to policy makers, as it stands, is that only CO2 need be addressed for lower concentrations... [Government of South Africa]	Cumulative CO2 emissions are strongly correlated with total, not just CO2-induced warming, with some scenario dependence indicated by the ellipses. Point addressed in table in topic.
SPM	11	4			In the figure SPM 5 - Part B, titles can not be read, it should improve. [Government of Costa Rica]	Figure has been simplified
SPM	11	4			The integration of information from WG1 and WG3 is highly appreciated. [Government of Germany]	As is this comment

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	4			Figure SPM.5: The integration of information from WG1 and WG3 is highly appreciated. Some suggestions for improvements: Figure SPM. 5 (b) is too small, fonts are tiny and the legend too complex. The rather long explanation within the caption does only help little to understand. Please improve the presentation of this very important figure. [Government of Germany]	Figure and legends simplified
SPM	11	4			Fig SPM 5 (b) in axis try to avoid use of the term "anomaly" in the SPM as technical term. Use instead terminology in the fig caption, e.g. "Global mean surface temperature increase relative to 1861-1880" or just "temerature increase relative to" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Accepted
SPM	11	5	11	5	"the resulting radiative forcing levels" should be deleted because it is not shown in the figure. [Government of Japan]	Accepted
SPM	11	5	11	5	"radiative forcing levels" - sorry if I miss it, but I couldn't see this on the figures [Keith Shine, United Kingdom]	Accepted
SPM	11	5	11	5	figure (A) is the y-axis with the radiative forcing level missing? [Monika Rhein, Germany]	Accepted
SPM	11	5	11	5	The radiative forcing levels referred to in the caption of Figure SPM.5a are not shown (labelled) in the axis. [Government of South Africa]	Accepted
SPM	11	5	11	6	The description of panel A is not easy to understand. It is confusing that resulting RF levels are mentioned, since the figure does not depict or mention RF levels. If the WGIII categories are mentioned but not explicitly listed, a more accurate reference to where the reader may find them is necessary. Also, it seems different colour codings are used compared to WGIII Figure SPM.4, which is potentially confusing. Suggest to simplify: "Annual CO2 emissions in the RCPS (lines) and for categories of associated scenarios used in WGIII (coloured areas) (as described in Table 3.1 (which needs to depict the colours))" [Government of Denmark]	Figure and legends simplified
SPM	11	5	11	6	Radiative forcing levels are not shown in panel A, therefore delete the text in caption that refers to this. 2. Can the word "associated" be deleted here? In what way are the WGIII scenarios associated with the RCPs? 3. Need to explain why the vertical bar at the right hand Y axis extends beyond the range of the coloured areas in the graph. [Government of Canada]	Accepted
SPM	11	5	11	6	This figure needs to be clarified. The caption doesn't currently make sense as radiative forcing levels are not shown in panel (a) and whilst the lines are explained, the bands around them are not. [Government of United Kingdom of Great Britain & Northern Ireland]	Figure and legends simplified
SPM	11	5	11	6	Figure legends are labeled as (A) and (B) but (a) and (b) in the caption. The authors may want to be consistent in labeling. [Government of United States of America]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	5	11	6	The figures SPM. 5 caption using lower case letters (a) and (b) while the figures themselves are marked with capital letters (A) and (B). This should be consistent. [Government of Vietnam]	Accepted
SPM	11	5	11	15	The figure and caption have to be clearer and the text less technical [Government of Ireland]	Accepted
SPM	11	5	11	15	The reader is immediately confused by the fact that there are 4 RCPs and five different coloured bands in the panel (A). The intuitive picture would have had each RCP in a band which was the same colour as that RCP only paler. There needs to be some explanation, perhaps in a footnote, of why it is not presented in that fashion. People are used to seeing the 4 SRES scenarios with bands around the four as in SYR of AR4 [Rachel Warren, United Kingdom]	Figure and legends simplified
SPM	11	5	11	15	difficult to understand figure B, impossible to read and review legend with current low sharpness. [Government of Sweden]	Figure and legends simplified
SPM	11	5	11	15	For (a), the WGIII scenarios are missing from the legend. Furthermore the SPM lacks any mention or explanation of what these WGIII scenarios cover. In contrast, a short summary of what the RCP scenarios are is given on SPM page 10) For (b) the caption states "described in section 3.2)". But since section 3.2 is not part of the SPM it should probably be reformulated to explicitly state that this is SYR Topic 3.2. Suggest to add at the end of the caption a sentence like "WGIII scenarios categories are described in SYR 3.2", this will clarify for both (a) and (b). Perhaps some more text to put the WGIII scenarios in context with the RCP is needed in the SPM and/or the SYR main tex [Thomas Stocker/ WGI TSU, Switzerland]	Scenario categories now labelled on figure

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	5	11	15	Figure SPM 5.a: Refer to Figure 2.1a and replace to line 6. From this figure alone is not possible to understand what the colored areas refer to. Figure SMP 5.b: Shorten caption. Some parts of the text are also clearly indicated in the axis labels or legend, remove bold parts --> suggestion: "Global mean surface temperature increase as a function of cumulative total global CO2 emissions from 21 various lines of evidence. Multi-model results from a hierarchy of climate-carbon cycle models for each RCP until 2100 22 are shown (coloured lines). Model results over the historical period (1860 to 2010) are indicated in black. The coloured plume illustrates the multi-model spread over the four RCP scenarios and fades with the decreasing number of available models in RCP8.5. Decadal averages are labelled using dots with the label referring to the year ending the decade. Triangles correspond to estimates for the year 2100 under 962 scenarios evaluated by WGIII, divided into the 7 categories. described in Section 3.2. The four large star symbols are estimates for the 4 RCPs by the MAGICC6 simple model, with the set up used for the WGIII scenarios estimates. Temperature values are always given relative to the 2 1861-1880 period, and emissions are cumulative since 1870. " Add: "Decadal averages are labelled with dots referring to the year ending the decade. To make it more clear, the star symbols could be in the color of the corresponding RCP. [Government of Netherlands]	Good suggestions, used in the simplification of the figure and caption
SPM	11	5	11	15	<Figure SPM.5 (B)> 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]	Accepted
SPM	11	5	11	15	Figure SPM.5 Panel B: Consider simplifying this Panel if possible. Consider the option of placing the large stars on the temperature curve currently used in Fig SPM. 6. The word "anomaly" (on the Y-axis) is technical jargon - suggest replacing with "change" or "departure". [Government of Canada]	Accepted
SPM	11	5	11	15	Figure SPM.5 caption: Suggest that the SYR SPM in particular, but also the SYR itself, avoid to the extent possible, differentiating between practices, classifications, assessment methods, etc., that are adopted in the different WGs. The point is to synthesize, and therefore to erase these boundaries to the extent possible in summarizing the key take-away messages for policy makers. Saying that WGIII did something in a particular way, and therefore implicitly saying that another WG might have done this differently, undermines messages by introducing a potential source of doubt in the minds of readers in instances where there may in fact, be no basis for adding uncertainty beyond that which is assessed. [Government of Canada]	It is important to emphasise that different approaches give a common message, and also important to be clear that there are different equally defensible approaches available.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	5	11	15	It is unclear in this figure what is the climate model parameterization and relation to model distribution. For example, I could not track down what is meant by "with the setup used for the WGIII scenarios estimates" or what this means (e.g. where does this lie in the range of climate sensitivity and TCR). Suggest a clear reference to where this is explained in the underlying SYR document and where this is put into context of the WGI results and the TCRE range. [Haroon Kheshgi, United States of America]	Figure has been simplified. Details now provided in the topic.
SPM	11	5	11	15	The figure caption is too complicated and difficult to read for the audience of the SYR. We recommend that the authors revise the language of the caption to improve its accessibility. [Government of United States of America]	Figure and legends simplified
SPM	11	5	11	15	Fix Fig 5B - this should return to the WGI SPM version that correctly includes both a grey area and the amber shaded area. The one shows the importance of non-CO2 GHG in the cumulative CO2 emissions. This should distinctly NOT use unpublished MAgICC results here. It is highly misleading. [Government of United States of America]	Several governments have supported the integration of WG1 and WG3 material. MAgICC results are published and in approved WG3 SPM
SPM	11	5	11	15	This figure label is so full of jargon and the figure is so cluttered that even as an expert I am left flummoxed. The figure should be simplified to the extent it can be and the caption made far more easily digestible by the target reader. There is just way too much info in this figure as it stands and it is way out of kilter in terms of its complexity with the remainder of the SPM figures which are substantially more easily digestible. [Peter Thorne, Norway]	Figure and legends simplified
SPM	11	5	11	15	Figure SPM.5 The resulting radiative forcing levels was not mentioned previously, so the meaning of it should be explained here or this could be omitted and said for different RCP scenarios only. Suggest to explain why it is necessary to apply two types/groups of scenarios (RCPs and "WGIII" scenarios) [Government of Hungary]	Radiative forcing omitted. Integration of WG1 and WG3 material
SPM	11	5	11	15	The figure is loaded and so is the legend. It would benefit from simplification and focus on the important points. The first part of the legend is not clear. It is CO2 emissions for the radiative forcing level of the different RCPs (or something equivalent). At first look, one can think that the values are in W/m2 and then one understands that there are only CO2 emissions plotted as a function of time. [Government of France]	Figure and legends simplified
SPM	11	5			The figure caption SPM.5(A) is not clear because radiative forcing levels seem not to be shown. CO2 emissions are shown. [Government of Germany]	Radiative forcing omitted (mistake in earlier caption)
SPM	11	5			figure 5 (A). We suggest to draw a horizontal line at the value zero, to highlight that the RCP 2.6 scenario has emissions near 0 (or negative) at the end of the century. [Government of Belgium]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	5			figure 5 : we suggest to present panels A and B as two separate figures - and in a larger size. The legend of panel B is too small to be readable. It is important to explain panel A in more detail : are each of the scenarios categories from WGIII associated to a RCP ? Please explain the link between those coloured areas and the WGIII scenarios. [Government of Belgium]	Figure has been simplified
SPM	11	6	11	6	Editorial: The text should read "scenario" rather than "scenarios". [Government of Norway]	Accepted
SPM	11	6	11	7	It might be useful to state here that the sea level rise projections are not based entirely on CMIP5 models (i.e. ice sheet contributions are estimated separately and added in). [Government of United States of America]	Noted. However, Figure does not include SL.projections. No action
SPM	11	6			I suggest some additions to the text in the caption reading "(b) 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]	Figure shows realised warming, but if emissions cease, this is close to eventual peak warming
SPM	11	7	11	9	"multi-model results", it should be given model numbers. "Model results", it should be given model numbers. [Zong-Ci Zhao, China]	Excessive detail for SPM
SPM	11	7			Suggest replacing 'various lines of evidence' with 'a range of models and scenarios'. [Government of Canada]	Observational evidence also plays a role
SPM	11	11	11	12	The triangles in the Figure legend seem to be in two colours: green and yellow. What do the two colours mean? This is not explained in the caption. [Government of Canada]	Figure has been simplified
SPM	11	11	11	13	The explanations of the triangles and stars are too terse for most policymakers to understand. Certainly no non-expert would have any inkling of what is meant by 'estimates ..by the MAGICC6 simple model, with the set-up used for WG3'. This level of detail (and the corresponding items in Figure SPM-5 itself) obscure the main message of the Figure and belong not in the SPM but in Fig 2.4 of the main text. [Tony Weir, Australia]	Figure has been simplified
SPM	11	11	11	15	This refers to 962 scenarios but so far the text has mentioned only the 4 RCP scenarios. It then refers to section 3.2 but that's about adaptation; does it mean section 3.2 of the Synthesis Report? A description of the modelling methodology in plain English needs to be added before the Figure. [Government of United Kingdom of Great Britain & Northern Ireland]	Details of the WG3 method are provided in the topic and in the WG3 report
SPM	11	12	11	12	Figure caption should refer to Table 3.1 when discussing the 7 categories. [Government of United States of America]	Noted. However we decided to instead refer to Figure SPM.11 which graphically presents the WGIII scenario categories just before Table SPM.1, which is the same as Table 3.1 from the underlying SYR.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	12	11	13	If MAGICC6 results are median values, that is to be mentioned explicitly, for example by changing the end of the sentence to "for the WGIII scenarios median estimates." [Government of Japan]	Noted. The RCP stars are no longer included in the Figure.
SPM	11	12	11	13	Sentence on MAGICC6 should be removed [Government of United Kingdom of Great Britain & Northern Ireland]	Accepted
SPM	11	13	11	13	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. [Government of Sweden]	Accepted. Reference to MAGICC6 now in topic
SPM	11	14	11	14	"Temperature values are always given relative to 1861-1880" . Always? Within Fig SPM-5, maybe, but p11 line 35 and p12 line 12 give different baselines. Such changes (which affect the numbers) are traps for most [unwary] readers! [Tony Weir, Australia]	Use of different baselines is necessary because of different lines of evidence: clarified where space permits
SPM	11	14	11	14	Figure SPM5: Why using here now only 20 years while previously at least 30 years were taken after the recommendation of WMO. [Government of Hungary]	Choice of baseline consistent with WG1, and dictated by need for a period of low volcanic activity
SPM	11	15	11	15	use {} instead of () for line of cite [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
SPM	11	15	11	15	Precise that permafrost emissions are not included [Government of Switzerland]	Anthropogenic emissions is clear
SPM	11	15	11	16	In the phrase "The global mean surface air temperature change for the period 2016-2035 will likely be in the range 0.3°C-29 0.7°C" it should be added that is relative to 1986-2005 [Government of Netherlands]	Accepted
SPM	11	15			Permafrost emissions are omitted from the calculations. [Michael Casey, Ireland]	Anthropogenic emissions is clear
SPM	11	17	11	18	Suggest to rewrite "Cumulative emissions of CO2 are the dominant factor determining the global mean surface warming" to be consistent with the description in WG1 SPM p.27 "Cumulative emissions of CO2 largely determine global mean surface warming by the late 21st century and beyond (...)" [Government of Japan]	Accepted. Text revised to the exact wording from the approved WGI SPM: "Cumulative emissions of CO2 largely determine global mean surface warming by the late 21st century and 13 beyond"
SPM	11	17	11	20	These two statements do not seem as strong as those included in the WGI SPM. Suggest that identifying the approximate linear relationship between cumulative emissions and global mean surface temperature is a significant point to reiterate in the SYR. [Government of Canada]	Accepted. We have changed the text to match the WGI SPM wording closely: "Cumulative emissions of CO2 largely determine global mean surface warming by the late 21st century and 13 beyond {2.4.5}. There is a strong consistent almost straight-line relationship between cumulative CO2 14 emissions and projected 21st century temperature change in both the RCPs and the wider set of mitigation 15 scenarios analysed in WGIII (figure SPM.5.b)"

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	17	11	20	Some clarification is needed here. Since temperature increases are a function of GHG emissions in climate models this sentence needs some context to avoid reading like a statement of the obvious. Perhaps something like, "Among all GHGs, CO2" [Government of United States of America]	CO2 is the main cumulative gas
SPM	11	17	11	23	This part should be consistent with the description in the page 27 of the approved WG1 SPM. Especially, this part should describe concrete amounts of >33% probability because abbreviating the information of >33% probability is artificially biased. [Hirofumi Kazuno, Japan]	Accepted
SPM	11	17	11	26	Suggest adding the reference to the "meeting the 2°C goal with a >50% probability case" from the WG3 SPMTTable.1 as below. "..and meeting the 2°C goal with a >50% probability will require GHG emissions reductions of roughly 40% to 55%(without overshoot), 25%~55%(overshoot of 530ppm)in 2050 relative to 2010" [Government of Japan]	Only highlighting exemplary figures is possible in the SPM
SPM	11	17	11	26	According to the Table 6.3 of WG3, should be the number of ">66%" changed to ">63%" (or ">73%" when the middle of the range is used.)? Please describe it precisely. [Keigo Akimoto, Japan]	Figures in text are clarified
SPM	11	17	11	26	Add the case of 480-530 ppm CO2eq, which is >39% (or >54% when the middle of the range is used) for 2 deg C increase. In this case, the emission in 2050 is between -57% and +4% relative to 2010. This should be added. [Keigo Akimoto, Japan]	Figures in text are clarified
SPM	11	17	11	26	These conclusions were viewed by the many as the key message policymakers of the WG1 report- witness numerous media stories when it was released. But highlighting only the first sentence conceals the hard-hitting quantitative conclusion of the last sentence. This last sentence is one of the key quantitative messages of the report, and should be highlighted in bold. If style conventions imply this means it should become a new paragraph, so be it. [Tony Weir, Australia]	Accepted
SPM	11	17	11	26	This para is so important that it warrants being made easier for policy makers (who will read only the SPM) to follow its chain of reasoning. This requires only expanding the second last sentence and slightly clarifying the last sentence , to read (say) "For >66% probability this requires cumulative emissions of CO2 from 2012 to 2100 to be below 1010 GtCO2 , since 1890GtCO2 [1630-2150] was emitted by 2011. Thus meeting the 2oC goal with a >66% probability will require total GHG emissions (CO2e) to reduce by....". [Tony Weir, Australia]	Accepted
SPM	11	17	11	26	• SPM [P11 L 17-26] of SYR shall include references from SPMs and relevant % of agriculture, land-sue and other sectors. [Government of Saudi Arabia]	For an SPM, only global emission reduction statements can be given.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	17	11	26	Paragraph is unclear, stating a CO2 budget for limiting warming to "less than 2 degrees C", then a GHG percent reduction for "meeting the 2 degree goal". (1) Language: For policymakers, is "meeting" equally or less stringent than "less than"? Suggest clarifying. (2) Units/metrics: For a fixed goal (or RCP), suggest providing cumulative caps and percent reduction targets, in both CO2 and total GHG terms. [Government of United States of America]	Paragraph has been clarified
SPM	11	17	11	26	This whole paragraph needs clearer explanation. a lot of confusion has been generated by the discussions of cumulative emissions in both WGI and III, and it has been difficult to understand the numbers. Also, it's not clear how the the contribution of non-CO2 gases impacts on the cumulative emissions budget in WGI so would be good to clarify here. [European Union]	Paragraph has been clarified
SPM	11	17	11	37	There are mixed reference periods for temperature increase in these paragraphs: preindustrial and 1850-1900. This create confusion. [Government of Switzerland]	Preindustrial is defined in the Glossary as before/in 1750. In few cases clearly specified in the SyR, the 19th century period 1850-1900 is used as a proxy for pre-industrial, for lack of earlier data.
SPM	11	17			missing information about a confidence level [Government of Netherlands]	Statement is high confidence, the default (see Uncertainty guidance note)
SPM	11	17			cumulative emissions budget remaining for 2 degrees to be discussed here (synthesis) [Government of Netherlands]	Accepted
SPM	11	18	11	18	{2.4.5} should be moved to the end of the paragraph (to line 26) [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
SPM	11	18	11	19	In the phrase "global-mean surface air temperature change for 2081–2100 will likely be 0.3°C–1.7°C" it should be added that is relative to 1986-2005 [Government of Netherlands]	Accepted
SPM	11	18	11	20	Please consider including an explicit reference to "(Figure SPM.6)" after "... both the RCPs". Rationale: In our view this is necessary since you already give a reference to WGIII Figure 2.4 that shows this but only for the older SRES-scenarios. [Government of Norway]	Noted. Reference changed to Figure SPM.5b
SPM	11	19		20	temperature change in both the RCPs and the wider set of mitigation scenarios analysed in WGIII (figure 2.4). Before only the four RCPs' scenarios are mentioned, so it would be correct here to limit the main message for the RCPs, i.e.: temperature change for all the four RCPs. [Government of Hungary]	Accepted
SPM	11	20	11	20	The reference to "Figure 2.4" should be Figure SPM.5 (b), which is on the same page (SYR-11) and the identical to Figure 2.4 on p. SYR-58. [Government of Japan]	Figure 2.4 now contains more information than SPM5(b)
SPM	11	20	11	20	Since figure 2.4 is not present in the Synthesis report, it should not be indicated here. As far as the reader will not be able to consult it. [Nedal Katbeh-Bader, Other - Palestine]	Figure 2.4 is in the SyR

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	20	11	20	The sentence refers to figure 2.4, it would be more obvious to refer to figure SPM 5 B [Government of Denmark]	Figure 2.4 now contains more information than SPM5(b)
SPM	11	20	11	20	Reference should also be to figure SPM.5(b). [Government of Austria]	Accepted
SPM	11	20	11	22	This sentence implies very significant economic consequences and could be seen as policy prescriptive. The discussion on carbon budgets in WG I and WG III relies on many assumptions and has considerable uncertainties. The caption of the underlying TFE8 - Figure 1c clearly states "Note that the fraction of models cannot be interpreted as probability". Also the estimates are derived from one scenario and a very limited number of models (compare TFE 8 in WGI TS). Thus suggest to replace this sentence by: "Assessed climate model results exhibit maximum CO2 emission budgets of between about 700 and 1100 PgC (with 515 PgC already released) commensurate with limiting global temperature increase to less than 2°C." [Jochen Harnisch, Germany]	It is important to convey the implications of the carbon budget in terms of emission reduction requirements in self-consistent scenarios
SPM	11	20	11	22	Background information about this sentence was written in the WGI underlying report (Chapter 12, page 1113) after the approval of the WGI SPM, which means that the information has not been reviewed anyway. According to the added text, the cumulative emissions numbers of 3000 GtCO2 and 2900 GtCO2 for the target temperature are considered as conservative estimates with relatively low confidence because these numbers are based on ESM experiments only (not based on multiple lines of evidence) with the highest non-CO2 forcings among RCPs. This consideration should be explicitly mentioned here and also in Topic 4 on page 119. [Junichi Tsutsui, Japan]	Text and table emphasises these are simply fractions of simulations
SPM	11	20	11	22	Would like to request including the cases of >33% and >50% as in WG1 SPM for the information is very important for policy makers. [Government of Japan]	Space too limited in SPM
SPM	11	20	11	22	Please insert ">" before 50%. Also in the view of coherency, we would like to point out that according to WG1SPM, the upper limit of >50% case is "3010 GrCO2" while "3000GtCO2" corresponds the >50% case in SYR. [Government of Japan]	Only highlighting exemplary figures is possible in the SPM
SPM	11	20	11	22	Since most of these numbers are clearly given in WGI SPM, we suggest that you rephrase the existing finding to only describe the remaining amount of CO2 available for the likely case. Please consider the following shorter formulation: "Limiting the warming to likely stay below 2°C relative to pre-industrial require future cumulative CO2 emissions to stay below about 1000 GtCO2, when accounting for non-CO2 forcings.". Also, since this is the SYR SPM it would be very helpful for policymakers if you could provide guidance that would help them to understand that there is a clear linkage with respect to the 2 degree goal between remaining emissions (1000 GtCO2), atmospheric concentrations in 2100 (~ 450 ppm), and the Representative concentration pathway (RCP2.6). [Government of Norway]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	20	11	22	WG1 did not conclude on a best value or a p.d.f. for ECS. Thus it does not make sense to be so specific as "50%" or ">66%" here. Please consider using "likely" etc. instead of percentages to be consistent with other paragraphs. [Government of Norway]	Accepted
SPM	11	20	11	22	Please add ">" before "50%" as well as "66%". In addition, according to the SPM of WG1, the number is not "3000 GtCO2" but is "3010 GtCO2". [Keigo Akimoto, Japan]	Only highlighting exemplary figures is possible in the SPM
SPM	11	20	11	22	The case for >33% probability should be added in order to meet the SPM of WG1. [Keigo Akimoto, Japan]	Paragraph has been substantially revised. These numbers no longer appear.
SPM	11	20	11	23	<p>Please include the all the information which the corresponding part of WG1 SPM contains. Especially the SPM text on the cumulative CO2 emissions "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)" should not be omitted.</p> <p>(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]</p>	Only highlighting exemplary figures is possible in the SPM
SPM	11	20	11	23	These lines convey critical information for policymakers, but these sentences need to be simplified. Suggest that it may not be necessary to give cumulative emission limits for both probabilities in the SYR SPM. The phrase "accounting for non-CO2 forcings" also requires more explanation for readers not familiar with the WGI report - suggest adding text that explains that all the RCPs allow for some level of ongoing non-CO2 GHG emissions and that these will exert some warming that must be taken into account when estimating how much CO2 can be emitted to keep within a specified upper limit on global warming. In the following sentence, suggest stating plainly that about two thirds of the allowable emissions consistent with staying below 2degC have been emitted already (the relevant amount in GtC could be footnoted to maintain traceability to WGI conclusions). [Government of Canada]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	20	11	26	This is a very important paragraph of the carbon budgets, and it is unnecessarily unclear for a regular reader. In addition, the message that emissions levels would need to be brought near zero GtCO ₂ eq or below as late as 2100 could be misleading, when in the most important sector - energy - emissions will have to be brought to zero well before that (WG1, Figure TS.19 suggests that for the RCP2.6 fossil fuel emissions would have to be brought to zero around 2070). I recommend improvements accordingly. [Kaisa Kosonen, Finland]	Accepted
SPM	11	20	13	19	The description of projected climate changes is sometimes hard to follow. For example, why the changes to the water cycle, which are essential to policymakers, or the ocean are not included? Suggestions: Water cycle: 'Changes in the global water cycle over the 21st century will not be uniform. The contrast in precipitation between wet and dry regions and season will increase. There may be regional exceptions'. Ocean: 'The global ocean will continue to warm during the 21st century. Heat will penetrate to the deep ocean and affect ocean circulation. it is very likely that the AMOC will weaken over the 21st century, but it is very unlikely that it will undergo an abrupt transition or collapse for the scenarios considered.' [European Union]	This section focusses on global temperature changes
SPM	11	20		21	The meaning of the sentence, "limiting the warming...non-Co ₂ forcing" is not clear. . It seems to suggest that the difference in cumulative emissions which allow probabilities of remaining below 2°C between 50% and a greater than 66% are very similar. That is, between 29000 and 3000 GtCO ₂ the probability of achieving the 2°C goal is significantly undermined. Would this be the correct interpretation. the text should be very clear on this important message. [Government of Ireland]	Only highlighting exemplary figures is possible in the SPM.
SPM	11	20		22	DELETE: lines 20-22. RATIONALE for DELETION: Cumulative carbon eq emissions have been calculated for a 1.5°C policy limit and must be included here as the main target because with the rapid emergency response of RCP2.6, temperature rise could feasibly be limited to 1.5°C. REPLACE line 20-22 WITH: 1.5°C goal, 430 CO ₂ eq ppm stabilization, 630 GtCO ₂ cumulative carbon, -72% change from 2010 by 2050, -118% CO ₂ eq change from 2010 by 2100 (AR5 WG III, Table TS1). [Peter Carter, Canada]	Only highlighting exemplary figures is possible in the SPM. Focus on 2 degrees is consistent with Cancun pledges
SPM	11	20			Compare this text to lines 17-27 on page 16 [Government of Sweden]	Action unclear
SPM	11	20			Incorrect figure ref. Replace 2.4. with SPM.5 [Government of United Kingdom of Great Britain & Northern Ireland]	Figure 2.4 now contains more information than SPM5(b)
SPM	11	21	11	21	Should this read ">50%"? [Government of Sweden]	text has been adjusted
SPM	11	21	11	21	Suggest review. The change from 50% to >66% implies a difference in emissions greater than 100 GtCO ₂ (i.e. only 3% fewer emissions). [Government of Australia]	Text now highlights one level only
SPM	11	21	11	21	Should say >50% rather than 50%. [Government of United States of America]	text has been adjusted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	21	11	22	Use of both numbers here just makes this extremely confusing. It raises as many questions as it answers. Why did you pick these two thresholds? And what value does providing two numbers from what must be a continuum add to the reader and why these two? Surely 90%, 95% would be more intuitive numbers here? If you choose to go with more than one number you could provide a small table that enumerates several thresholds e.g. 50, 66, 90, 895 and 99. This table would be more accessible than placing in text with just two quasi-arbitrary thresholds and help inform a policymaker who understands risk and wants to know more than two points on this continuum? [Peter Thorne, Norway]	Text now highlights one level only
SPM	11	22	11	22	It is often not straightforward to distinguish when emission levels and reductions in them are for CO2 only without other assumptions, for CO2 with assumptions on non-CO2 gases or CO2eq. Here, as well as throughout, more clarity would be useful. Here, in particular, information on the assumptions on non-CO2 forcings is needed for proper framing. [Government of Sweden]	Accepted, within the constraints of the SPM
SPM	11	22	11	22	Both numbers are similar and not logical given the message this conclusion conveys. It would be more logical if the number include emissions with and without non-CO2 greenhouse gases. This would imply about 3000 Gt and 3600 Gt respectively consistent with WGI SPM. [Government of Netherlands]	Text now highlights one level only
SPM	11	22	11	22	Here cumulativeCO2 emissions are reported to be 1890 GtCO2 in 2011. On page 9, line 9 the number is 2000. The correct number would be 1989 Gt CO2, which might be rounded to 2000 , or 1990 Gt CO2 [Monika Rhein, Germany]	Accepted; (corrected) numbers are now only provided in Topic 1: "Between 1750 and 2011, cumulative anthropogenic CO2 emissions to the atmosphere were 2040 ± 310 GtCO2."
SPM	11	22	11	22	Figure 2.4 doesn't show this. It doesn't mention non-CO2 forcings. [Government of United Kingdom of Great Britain & Northern Ireland]	Figure 2.4 now shows both CO2 and all-anthropogenic warming
SPM	11	22	11	22	When accounting for non-CO2 forcings - but on what kind of emissions pathway - BAU? Zeroed out? Please clarify. [Government of United States of America]	Topic clarifies that non-CO2 warming similar across RCP scenarios
SPM	11	22	11	22	This does not explain the importance of non-CO2 GHG forcing in reducing the CO2 cap - it should make it clear: e.g. for likely < 2C, the cap is 1000 GtC and 500 GtC already emitted. With non-CO2, the cap in C is 790 GtC (see WGI details) and thus the current ceiling drops from 500 to 290 GtC (-42%). [Government of United States of America]	Accepted
SPM	11	22	11	23	to delete 1890 and keep the ranges only. [Nedal Katbeh-Bader, Other - Palestine]	This figure is needed for clarity
SPM	11	22	11	23	Is it possible to also indicate in this sentences the remaining carbon to reach the 2 degree goal. [Government of Norway]	About 1/3 of 2900. Inadvisable to present the same information in too many ways
SPM	11	22	11	23	It seems that there is an inconsistency: the 2000 +/- 310 number does not match the 1890 number (1630-2150) on page 9 line 10. [Government of Switzerland]	Accepted; (corrected) numbers are now only provided in Topic 1: "Between 1750 and 2011, cumulative anthropogenic CO2 emissions to the atmosphere were 2040 ± 310 GtCO2."

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	22	11	26	Explain 'non-CO2 forcing' as term is quite technical for SYR-SPM (and used for first time in text); Furthermore, all figures/discussion is about CO2 but then a statement involving GHGs is used ('will require GHG emission reductions..'). [European Union]	Technical language edited out of final version
SPM	11	23	11	23	"require" should be replaced with the wording such as "characterized by" (e.g., WG3 SPM Page 11 Line 9) as this part is explanation of assumptions which mitigation scenarios are based on. [Government of Japan]	Accepted
SPM	11	23	11	23	Since there are uncertainty in modeling it is relevant to add a word to indicate the uncertainty in understanding. [Mingshan SU, China]	Uncertainties are detailed in the topic
SPM	11	23	11	24	Meeting the 2°C goal with a >66% probability will require GHG 23 emissions reductions of roughly 25% 40% to 70% in 2050 relative to 2010 [Government of Bolivia]	Accepted
SPM	11	23	11	26	I suggest to avoid the term "probability" in this context of reaching the 2°C. It suggests more certainty than can be found in the underlying scientific assessments of WG I and III. Suggest "A majority of assessed model simulations require emission reductions of roughly 40% to 70% in 2050, ... " [Jochen Harnisch, Germany]	Accepted
SPM	11	23	11	26	This statement is contradictory to the evidence in page 10, lines 26-28 where is enumerated the most important drivers of climate change, limiting the fundamental changes to energy system and land use and agriculture, and excluding. Please include economic activity, Livelihood, lifestyles and behaviors. [Carlos Méndez, Venezuela]	Sentence has been removed
SPM	11	23	11	26	This statement is not suitable for the content in this paragraph because it can lead to inconsistent understanding as follows: Based on the numbers in this paragraph, cumulative CO2 emissions in 2011–2100 for meeting the 2 degC goal with a >66% probability is about 1050 GtCO2 (assuming 2011 emissions of 10 GtC) [2900 GtCO2 (Cum. emission since 1870) – 1890GtCO2 (amt. emitted by 2011) + 10GtC x 44/12 = 1047 GtCO2---which is about 1050 GtCO2]. According to page 13 of WGIII Table SPM.1, 1050 GtCO2 is included in several categories, and does not correspond only to 40–70% reductions in 2050 for 450 ppm-eq category. [Government of Japan]	Numbers have been reconciled with WG3 summary
SPM	11	23	11	26	This paragraph is not the place to discuss emission reductions for staying below 2 degrees and this is sufficiently covered in SPM 3.1, so we suggest to delete the sentence "Meetingin line 23 and move this material to page 16, where the emissions reductions are discussed. Also we suggest to add a statement on the remaining cumulative budget for staying below 2 degrees, based on SyR 59, lines 7-9. [Government of Netherlands]	It is important to convey the implications of the carbon budget in terms of emission reduction requirements in self-consistent scenarios

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	23	11	26	Based on the Table 6.3 of WG3 Final Draft, this part should describe "Meeting the 2°C goal with a >50% probability will at most require GHG emissions reductions of roughly 55% and at least accept GHG emission increase of 4% in 2050 relative to 2010" because abbreviating the information of >50% probability is artificially biased. [Hirofumi Kazuno, Japan]	Paragraph has been clarified
SPM	11	23	11	26	Please consider to substitute: "Meeting the 2°C goal with a >66% probability" with "In order to likely meet the 2°C goal will require GHG emissions reductions of roughly 40% to 70% in 2050 relative to 2010 through". [Government of Norway]	Accepted
SPM	11	23	11	26	We believe that it is relevant for policymakers to also be aware that there are several positive feedbacks between carbon budget and the climate system, which means that more of the CO2 emitted would remain in the atmosphere (ref: SYR topic 2.4.4). Has this been accounted for when calculating how much CO2 that can be emitted to stay below 2°C in the future. If this is not included in the calculations we believe you should consider to make this information available, and indicate that this implies that reductions would need to be in the higher range of 40-70%. [Government of Norway]	This information is taken into account in the CMIP5 simulations from WG1
SPM	11	23	11	26	Suggest that the final sentence of this paragraph could become the bolded statement rather than embedding it at the end of this supporting paragraph, as this information is very important. Suggest also making the statement that "emission levels near zero GtCO2eq or below" (are required) a stand-alone sentence (separate from the first part of this sentence. This is a critical piece of information and should not come at the end of a long sentence. Also, suggest: (1) Adding "global" before "GHG emission reductions", to ensure readers understand that 40-70% emission reductions globally are required, with possibly more or less than this amount for individual countries. (2) Replace "or below" with "or even negative", which the challenge in achieving this more obvious. Explain that achieving negative emissions requires that more CO2 is actively removed from the atmosphere than is emitted. It would be helpful to be very clear about the extent to which achieving negative emissions is contingent on the widespread implementation of BECCS or whether there are other options for achieving negative emissions. (3) The reference to SYR Box Art. 2 is inadequate. There is no further discussion of this point in the Box on Article 2. The same sentence as is here is in the Box and that it is (lines 19-20 page SYR-119). [Government of Canada]	Good points: used in redrafting paragraph. We believe it is clear this section is concerned with global emissions.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	23	11	26	suggest Either delete or move to the end of the sentence or leave out altogether the text "through fundamental changed to energy systems an dpotneially land use and agriculture" in part because it breaks up the sentence and relates just as much to the 2100 goal and the 2050 goal, but also because it is really part of the mitigation section. The mitigation point aside,I would actually say that the statement in this sentence ont he need for CO2 reduction is more of a headline statement than the one that tops this paragraph and suggest putting it up there and makign the current headline sentence the second, un-bold sentence. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Now moved to section 3 of the SPM
SPM	11	23	11	26	First half of this sentence "Meeting the 2C goal.... Relative to 2010" is good and needs more prominence. [Government of United Kingdom of Great Britain & Northern Ireland]	Now moved to round off paragraph
SPM	11	23	11	26	Can anything be said about the difference in mitigation requirements between the bottom and top of this range? For example, does the lower end of the range imply a need for more negative emissions later on or higher post-2050 reduction rates? [European Union]	New sentence added: "Higher emissions in early decades..."
SPM	11	23	11	26	This sentence is not consistent with the uncertainty guidance e.g. what does roughly mean in calibrated uncertainty for IPCC? [Peter Thorne, Norway]	Accepted
SPM	11	23		26	RETAIN: "Meeting the 2°C [ADD: and 1.5°C] goal [...] will require [...] fundamental changes in energy systems and [DELETE WORD: potentially] land use and agriculture, and emission levels near zero GtCO ₂ eq or below [DELETE WORD: in] [ADD: well before] 2100." RATIONALE: For mitigation, CO ₂ eq concentrations must not include cooling from air pollution acid aerosols (as in the SYR) because this is a large unavoidable deferred warming because of zero carbon emissions. [Peter Carter, Canada]	Accepted in part: "well before 2100" is too strong for many scenarios
SPM	11	23			• SPM [P11 L23] insert as Scenarios consistent with the likely chance to keep temperature change below 2°C relative to pre-industrial levels includes GHG [Government of Saudi Arabia]	Accepted, with further revisions
SPM	11	23			I suggest replacing "Meeting THE 2 °C goal" with "Meeting THIS 2°C goal" - since it refers back to the 2°C described three lines earlier rather than some generic 2°C goal (e.g. the UNFCCC one about which there has so far been no discussion in the SPM). [David Wratt, New Zealand]	References to a specific "goal" have been deleted
SPM	11	24	11	24	It is said that to reach the 2°C goal there should be an emission reduction of 40% to 70% percent in 2050, where does this percentage come from? According to the 4th assesment report Annex I countries as a group needed to reduce their emissions to below 1990 levels in 2020 by 25% to 40% for 450 ppm, has this changed? [Government of Ecuador]	WG3 SPM
SPM	11	24	11	24	Write: "... fundamental change inter alia in ..." [Government of Switzerland]	Wording deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	24	11	24	The reference to the "fundamental changes" add to the report a value judgment. Who will be defining what is fundamental changes, this could be prescriptive. In my view, a fundamental changes could be changes in the patterns of consumption primarily and not in the energy system and land use and agriculture. [Government of Venezuela]	Wording deleted
SPM	11	24	11	25	Fundamental changes in energy systems' is a very much nonspecific sentence. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Wording deleted
SPM	11	24			Suggest replace the term "roughly" with "between" [Government of Ireland]	Accepted
SPM	11	24			I would remove word "roughly" and is it "in 2050" or "by 2050". [Government of Netherlands]	Text has been revised. Comment no longer applies here.
SPM	11	25	11	25	to delet: (and agriculture) as it seems a misleading text. [Nedal Katbeh-Bader, Other - Palestine]	Wording deleted
SPM	11	25			For clarity, suggest adding the phrase "and [continued reduction to] emissions levels near zero...by 2100". [Government of Ireland]	Accepted
SPM	11	25			emission levels near zero GtCO ₂ eq or below ~ it might be unclear for the readers why this statement is for GtCO ₂ eq while before all this para was referring "only" to CO ₂ emissions. [Government of Hungary]	Wording clarified
SPM	11	26	11	26	Call out to "Box Art 2" is unclear. What is meant? [Jochen Harnisch, Germany]	Point is further discussed in Box
SPM	11	26	11	26	Precise that permafrost emissions are not included [Government of Switzerland]	Additional risks and uncertainties discussed elsewhere
SPM	11	26			permafrost emissions are omitted from the calculations [Michael Casey, Ireland]	Additional risks and uncertainties discussed elsewhere
SPM	11	27	11	27	Please bring here the Table SPM.3 from the WG1 SPM that shows the carbon budgets related to each RCP. It should be accompanied by the footnote 20 from page 17 of the WG3 SPM, which gives carbon budget numbers for (the limited number of) 430 ppm scenarios. [Kaisa Kosonen, Finland]	Reproducing table is not consistent with length of SPM
SPM	11	27			Insert that "On some analysis run by WGIII that accounted for carbon cycle uncertainties it became apparent once non CO ₂ forcings were included that the CO ₂ emissions budget is already exhausted to limit warming to RCP 2.6 and under 2C since pre-industrial. This can be clearly seen on page 59 in table 2.2. If one deducts the non CO ₂ forcings of 700bn (page 59 line 7 & 8) from 550 -1000 (lower left box) it is proven. This must be mentioned if the risk analysis in the SYR is to be objective and fair to policymakers. [Michael Casey, Ireland]	We believe the current (revised) language is balanced within length constraints
SPM	11	28	11	28	For a better understanding please add "all components of the climate system:" in front of "the atmosphere, ocean and the cryosphere." [Government of Germany]	Sentence has been deleted (too vague).
SPM	11	28	11	28	Edit needed. The "projected warming will affect.." only if it in fact does occur. [Government of United States of America]	Sentence has been deleted (too vague).

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	28	11	28	"will likely continue to affect..." Please add "likely" to this statement. [Government of United States of America]	Sentence has been deleted (too vague).
SPM	11	28	11	28	Please say something more specific or quantitative with this statement or remove. [Government of United States of America]	Agreed. sentence has been deleted.
SPM	11	28	11	29	What is the reference year for the temperature change? [European Union]	Reference periods are now specified.
SPM	11	28	11	31	Explain why RCPs is not mentioned in the context of near-term projections ("huge inertia of the climate system" etc) [Government of Sweden]	Agreed. text now states 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. By mid-21st century, the rate of global warming begins to be more strongly dependent on the emissions scenario. Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to likely be 0.3°C–1.7°C under RCP2.6 to 2.6°C–4.8°C under RCP8.5 (Figure SPM6). The ranges provided here for particular RCPs, and those given below in Section 2.2, primarily arise from differences in the sensitivity of climate models to the imposed forcing. {2.2.1, Table 2.1}
SPM	11	28	11	31	The line 28 comes from {2.4} and not {2.4.1} as stated on line 31. Line of cite on line 31 should be {2.4} [Thomas Stocker/ WGI TSU, Switzerland]	corrected.
SPM	11	28	11	31	No baseline year for calculation of temperature rise is found in this paragraph. It is suggested to add "relative to the period 1986-2005" after "0.3°C-0.7°C" based on WG I SPM. [Government of China]	Agreed. This is now clarified (1986-2005).

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	28	11	31	This para needs to say what scenarios are assumed. [Government of United Kingdom of Great Britain & Northern Ireland]	Agreed. text now states 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. By mid-21st century, the rate of global warming begins to be more strongly dependent on the emissions scenario. Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to likely be 0.3°C–1.7°C under RCP2.6 to 2.6°C–4.8°C under RCP8.5 (Figure SPM6). The ranges provided here for particular RCPs, and those given below in Section 2.2, primarily arise from differences in the sensitivity of climate models to the imposed forcing. {2.2.1, Table 2.1}
-----	----	----	----	----	---	--

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	28	11	31	<p>This paragraph needs some work to clarify the key message. Firstly, are you talking about the temperature change between 2016 and 2035 or the change from some other baseline? Secondly, is this change irrespective of scenario? If so, it would be good to add "regardless of the scenarios". Next, why pick 2016 as the start of this period? If you are trying to give an indication of committed warming over the next few centuries (which would be very useful to policy makers) then doesn't this need to start from 2012/13? Also, if it is committed warming you're discussing, please make this explicit. [European Union]</p>	<p>Agreed. text now states 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. By mid-21st century, the rate of global warming begins to be more strongly dependent on the emissions scenario. Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to likely be 0.3°C–1.7°C under RCP2.6 to 2.6°C–4.8°C under RCP8.5 (Figure SPM6). The ranges provided here for particular RCPs, and those given below in Section 2.2, primarily arise from differences in the sensitivity of climate models to the imposed forcing. {2.2.1, Table 2.1}</p>
SPM	11	28	11	31	<p>These numbers on temperature change lack the information of the baseline (the period 1861-1880 or 1850-1900?). An additional sentence should clarify that. Furthermore it would be great to use only one time period for the reference level throughout the SPM. [Government of Austria]</p>	<p>Agreed. This is now clarified (1986-2005).</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	28	11	31	This as worded only very indirectly gets at the fact that in the near term most of the warming is committed. It could do so more explicitly in the opening unbolded sentence and that would mke the following sentence more intuitive. At the moment that the near-term warming is largely committed can be divined from an indirect inference from the closing sentence - it should be clearer than that. [Peter Thorne, Norway]	Agreed. text now states "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. By mid-21st century, the rate of global warming begins to be more strongly dependent on the emissions scenario. Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to likely be 0.3°C–1.7°C under RCP2.6 to 2.6°C–4.8°C under RCP8.5 (Figure SPM6). The ranges provided here for particular RCPs, and those given below in Section 2.2, primarily arise from differences in the sensitivity of climate models to the imposed forcing. {2.2.1, Table 2.1}"
SPM	11	28	11	37	Please provide reference period for the temperature change projections. [Government of Sweden]	Clarified now. Reference periods are clearly mentioned.
SPM	11	28	11	37	Please state that the land surface will experience higher levels of warming than the global mean and there is a wide regional variations in projected warming, with some regions experiencing >2C during 2016 -2035 [Government of India]	Rejected,constrained by word limit. The maps are illustrating regional patterns of warming
SPM	11	28	11	37	It should be highlighted that the numbers for the projected temperature change refer to 1986-2005 as a reference period. [Government of Germany]	Clarified now. Reference periods are clearly mentioned.
SPM	11	28	11	37	Could you add a line on the regional distribution of warming - this is crucial [Government of United Kingdom of Great Britain & Northern Ireland]	Rejected,constrained by word limit. The maps are illustrating regional patterns of warming
SPM	11	28	11	37	One sentence uses the expression "global-mean surface air temperature", the other one "global mean surface air temperature" (without hyphen) and the third one "global surface air temperature" (without "mean"). It would be better to use the same expression. [Maria Carmen Llasat, Barcelona]	Accepted, "global mean surface air temperature" is used.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	28	11	37	This description of the projected warming is rather confusing. Why not using the highlighted text in WG1 SPM page 18, about the surface temperature relative to 2nd half of the 19th century? This would naturally link these paragraphs with the paragraph in lines 17-26. In addition, reference periods in the current text have not been provided, and they refer only to 1986-2005, according to WG1 SPM. [European Union]	Clarified now. Reference periods are clearly mentioned.
SPM	11	28	11	42	Very important that the reference year for the changes are given. Now it seems to be compared to a recent reference year. I prefer having the 1850-1900 as the reference. [Government of Sweden]	Clarified now. Reference periods are clearly mentioned.
SPM	11	28	11	42	The bolded description of the following paragraphs includes impacts on the cryosphere, but there is no discussion of this in the paragraphs that follow. A discussion should be included here. [Government of Germany]	Headline statemesnt used now. This issues has been addressed then
SPM	11	28	13	25	SPM-Section2: Future climate projection was carried out with different reference periods and this section is highly depending on the future climate projection. We would like to strongly suggest putting a footnote to clarify the reference period used such as a footnote 10 in WGIII SPM, "Based on the longest global surface temperature dataset available, the observed change between the average of the period 1850-1900 and of the AR5 reference period (1986–2005) is 0.61°C (5–95% confidence interval: 0.55 to 0.67°C) [WGI AR5 SPM.E], which is used here as an approximation of the change in global mean surface temperature since pre-industrial times, referred to as the period before 1750 (WGIII SPM footnote 10 in page 8)" [Government of Republic of Korea]	Clarified now. Reference periods are clearly mentioned.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	28			Clarify what the uncertainty is based on in ways that differentiate between uncertainty from climate models vs uncertainty from different emission scenarios [Government of Sweden]	The first paragraph after the headline in SPM Section 2.2 has been re-written, and now addresses this issue. It reads "Estimates of near-term future climate depend on the committed change caused by past anthropogenic forcing, 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 no major volcanic eruptions or secular changes in total solar irradiance before 2035. By mid-21st century, the rate of global warming begins to be more strongly dependent on the emissions scenario. Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to likely be 0.3°C–1.7°C under RCP2.6 and 2.6°C–4.8°C under RCP8.5 (Figure SPM6, Figure SPM7). The ranges provided here for particular RCPs, and those given below in Section 2.2, primarily arise from differences in the sensitivity of climate models to the imposed forcing. {2.2.1, Table 2.1} "
SPM	11	28			This bolded statement is somewhat obvious and not useful for the SPM. Can a more significant synthesis statement be provided here? [Government of Canada]	Headline statemesnt used now. This issues has been addressed then
SPM	11	28			This bold text does not contribute any new information. Much better to give a synthetic paragraph describing projected changes in climate system, using excerpts of highlighted text in WG1 SPM (pages 18, 22, 23). [European Union]	Headline statemesnt used now. This issues has been addressed then
SPM	11	29	11	29	Write: "The additionnal global mean surface temperature increase for ..." [Government of Switzerland]	This is approved WG1 SPM text
SPM	11	29	11	29	Please clarify the reference period : we suggest to add "relative to 1986-2005 " after "2016-2035" [Government of Belgium]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	29	Please give baseline years that this change is relative to. [Government of United States of America]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	30	The reference period for projected temperature change should be clearly shown. [Government of Japan]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	30	Is this statement valid for all scenarios? If so, please consider to specify it at the end of this sentence. [Government of Norway]	Clarified now.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	29	11	30	You probably mean "the average for the period 2016-2035" compared to an earlier period which should be mentioned. Possibly 1986-2005. [Government of Norway]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	30	A reference period for the projected temperature change needs to be specified (1986-2005). Without this, the value looks like the change over the 2016-2035 period. It also needs to be made clear that this is additional warming (additional to that which has already occurred). [Government of Canada]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	30	Give all the difference anomaly periods used in the SPM to date, I am not sure if this means the temperature change in 2035 compared to 2016 will be this much, or if it means the mean temperature change for 2016-2035 will be this much compared to the temperature at some other date e.g. 1986 to 2005 as in fig SPM6 which I assume is the case. If it is relative to 2000, why not give it relative to 1850-1990 as in the paragraph below and to keep more consistent throughout the SPM. Also on what is this range based? is this the range across the four RCPs and all climate models [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	30	The reference (or baseline) period for the projected temperature change should be stated. [Government of United States of America]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	31	Not sure how to read that; normally in sentences formulated like this one would expect e.g. "compared to 1986-2005". If that's how it should read, the correct reference need mentioning. Considering that AR5 will stand as a reference for some years to come, not sure if the period 2016-2035 is helpful for a reader in 2017. Maybe this sentence could be deleted. [Government of Denmark]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	35	Is the change in temperature a difference over the 2016-2035 period? Or vs. some base period? The same question applies to the "2.6-4.8C" range listed in line 34. In line 35, a base period of "1850-1990" is stated, but it's not clear this applies to the previous statements. Please clarify. [Government of United States of America]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	36	The discussion on 21st century projected warming refers to the 1850-1990 reference period. Is this period what the SYR considers as preindustrial? If so, it should be stated. Also Figure SPM.6 uses the 1986-2005 reference period, which is inconsistent with what is in the text. I don't see any reference to Figure SPM.6 in the text on temperature projections. Either the figure should be removed or redrawn to refer to the 1850-1990 reference, which is consistent with the text. [Government of South Africa]	Clarified now. Reference periods are clearly mentioned.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	29	11	37	It is essential to mention the reference period when temperature changes are given. Some of these are relative to 1986-2005 as in Table 2.1, whereas the latter statements are relative to pre-industrial (as stated). It is somewhat confusing to refer to different periods in the same paragraph. [Government of Denmark]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29	11	37	The mentioned temperature change (0.3-0.7 C) is not clear what it is respective to. Later on in line 35 1850-1900 seems to be the control period, which is a bit confusing after of figure SPM5 (1861-1880). [Government of Hungary]	Clarified now. Reference periods are clearly mentioned.
SPM	11	29		30	In the following sentence I think INCREASE should substitute CHANGE, and maybe (depending on scenario) should be added, or at least explain that the confidence is not very high because all scenarios are combined [The global mean surface air temperature change for the period 2016-2035 will likely be in the range 0.3°C-29 0.7°C] [Alessandra Conversi, United Kingdom]	This is approved WG1 SPM text
SPM	11	30	11	30	would benefit from adding after "...0.3°C-0.7°C (medium confidence)." something like "regardless of any mitigation policies taken now" or " regardless of scenario and any mitigation policies" [Jonathan Lynn, Switzerland]	This is approved WG1 SPM text
SPM	11	30	11	31	Emission scenario prevailing over what period needs to be mentioned. [Government of India]	As the sentence says, it is by mid-century
SPM	11	30		34	.. 0.7°C relative to .. (... .. under RCP8.5 relative to .. [Government of Hungary]	Clarified now.
SPM	11	33	11	33	Write: " ... air temperature increase for ..." [Government of Switzerland]	Rejected, change is more generic
SPM	11	33	11	33	Please add the reference period for temperatures changes (1986-2006), and clarify that it applies to all projections (when no reference period is mentioned the reader will think of warming with respect to the pre-industrial age). [Government of Belgium]	Clarified now. Reference periods are clearly mentioned.
SPM	11	33	11	33	It appears that the last word on this line should be "and" instead of "to." [Government of United States of America]	Accepted
SPM	11	33	11	34	The reference period for projected temperature change should be clearly shown. In the SPM of WG1 report, the reference period is described as follows: Increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to likely be [Government of Japan]	Clarified now. Reference periods are clearly mentioned.
SPM	11	33	11	34	Are these numbers related to the 1850-1900 average or 1986-2005 average? In our understanding they must be related to 1986-2005, so please consider to insert "relative to the reference period 1986-2005" after "for 2081–2100". [Government of Norway]	Clarified now. Reference periods are clearly mentioned.
SPM	11	33	11	34	Please put the first sentence in this paragraph in bold letters, because this is an important information. [Government of Germany]	Headline statemesnt used now.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	33	11	34	Give all the defference anomaly periods used in the SPM to date, I am not sure if this means the temerature change in 2081 comapred to 2100 will be this much, or if it means the mean temerature change for 2081-2100 will be this much compared to the temerature at some ohter date e.g. 1986 to 2005 as in fig SPM6 which I assume is the case. If it is relative to 2000, why not give it relative to 1850-1990 as in the sentence below and to keep more consistent throughout the SPM. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Clarified now. Reference periods are clearly mentioned.
SPM	11	33	11	35	The baseline reference period (1850-1900) should be specified in the first, rather than second sentence in this paragraph. [Government of United Kingdom of Great Britain & Northern Ireland]	Clarified now. Reference periods are clearly mentioned.
SPM	11	33	11	37	add "These are global averages, and land temperatures in many areas will be higher than these ranges, while ocean temperatures will be lower." (WGI, SPM, Figure SPM.8 (a)) [Jonathan Lynn, Switzerland]	Rejected,constrained by word limit. The maps are illustrating regional patterns of warming
SPM	11	33	11	37	suggest to add equivalent content of 4°C under different RCPs [Hui JU, China]	Rejected, constrained by word limit
SPM	11	33	11	37	Since the WG I report has reviewed the temperature rise under all emission scenarios, it is suggested to add words on the 4°C scenario by quoting a conclusion from WGI report at the end of the paragraph, which reads "Warming is unlikely to exceed 4°C for RCP2.6, RCP4.5 and RCP6.0 (high confidence) and is about as likely as not to exceed 4°C for RCP8.5 (medium confidence) by the end of the 21 century (from SPM WGI P18 E1)" [Government of China]	Rejected, constrained by word limit
SPM	11	33	11	37	There is a need to include reference periods here for the projected temperature changes. It should be clear that this is additional warming (additional to that which has already occurred). Also need to explain that to express the total amount of warming relative to pre-industrial, a further 0.61degC needs to be added. There is no reference to Figure SPM.6 in the SPM. Suggest this is a place to refer to Fig SPM.6. [Government of Canada]	Clarified now.
SPM	11	33	11	37	This paragraph could be summarised easily into a table - Table 2.1 could be brought into the SPM with an explanation of why Fig SPM.6 seems to contradict the text e.g. the text indicates a possibility that RCP2.6 will exceed 2 degrees but the figure suggest this is not possible. [Government of United Kingdom of Great Britain & Northern Ireland]	Figure SPM6 is relative to 1986-2005. Table 2.1 could have indeed in the SPM, but there is only a limited amount of tables/figures that could fit in the SPM.
SPM	11	33	11	37	You could move this paragraph to line 31 in order to write one only paragraph on global mean surface temperature and both of them are addressed to 2.4.1. [Maria Carmen Llasat, Barcelona]	Accepted, text has been rearranged.
SPM	11	33	11	37	The reference period is now 1850-1900. This cannot be easily compared to the previous paragraph which used 1986-2005 as a reference period. [Government of France]	Clarified now. Reference periods are clearly mentioned.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	33		35	RETAIN: "Global-mean surface air temperature change for 2081-2100 will likely be 0.3°C-1.7°C under RCP2.6. Global surface air temperature change for the end of the 21st century is likely to exceed 1.5°C relative to 1850-1900 for all RCP scenarios except RCP2.6." ADD: Except possibly for RCP2.6, all RCP scenario warming projections are under-estimates, because they do not account for any of the large-source amplifying carbon feedbacks. [Peter Carter, Canada]	Rejected. Projections do implicitly account for climate-carbon cycle feedbacks. CO2 concentrations were calculated from CO2 emissions, using a simple climate model (MAGICC) that takes into account carbon cycle feedbacks.
SPM	11	33		37	no reference to a figure SPM6, which shows change in average surface temperature. It is also unclear what is the difference between global mean air temperature and average surface temperature (SPM6). Additionally, change values are relative to 1850-1900 but in SPM.6 they are relative to 1968-2005. [Government of Netherlands]	Clarified now.
SPM	11	34	11	35	We think it is useful to specify the likelihood of exceeding 1.5°C for RCP2.6 and suggest to rephrase to: "Global surface air temperature change for the end of the 21st century is likely to exceed 1.5°C for RCPs 8.5, 6.0 and 4.5. RCP2.6 is as likely as not to exceed 1.5°C." [Government of Netherlands]	Rejected, this is WG1 SPM approved text.
SPM	11	34	11	37	(Table 2.1) is not part of SPM, hence the reference to it should perhaps be moved to the end of the paragraph on line 37 and put between {}. The line of cite on line 37 should then read {2.4.1, Table 2.1} [Thomas Stocker/ WGI TSU, Switzerland]	Accepted, reference to table 2.1 removed here
SPM	11	36	11	36	Given that the likely range of deltaT by 2100 relative to 1986-2005 for RCP8.5 is 2.6 to 4.8 (Table 2.1) I would have thought that RCP8.5 would be very likely (rather than just likely) to exceed 2C. Also reiterate what the reference years is here. It would be good to mention that the higher RCPs have the chance to exceed 3 or 4C at this point also [Rachel Warren, United Kingdom]	This is approved WG1 SPM text
SPM	11	36	11	37	Please consider to rephrase so that the most important finding comes first, for example: "RCP2.6 is the only scenario that is likely to stay below 2 degree C". Please also consider to make this a bold statement, because the RCP2.6 and its relation to the 2 degree target is very policy relevant. Please consider to include Table 3.1 (including both temperature as in WGIII Table SPM.1 and in addition sea-level rise as was done in Table SPM. 6 in AR4 SYR) in the SPM. [Government of Norway]	This is approved WG1 SPM text. Table 2.1 could have indeed been in the SPM, but there is only a limited amount of tables/figures that could fit in the SPM.
SPM	11	37	11	37	Please add the information about the warming process in longer term: "Warming will continue beyond 2100 under all RCP scenarios except RCP2.6." (WG1, SPM; p.20, chap. E1) [Government of Germany]	Rejected, the focus of this section is 2100. Section 2.4 goes beyond 2100
SPM	11	39	11	42	Suggest a little more explanation about the continuation of occasional cold winter extremes may be warranted, or else this sentence could be removed to avoid confusion. Does this exclude the potential for occasional cold extremes for other parts of the year? [Government of Canada]	Rejected, this is approved WG1 SPM text
SPM	11	39	11	42	This assessment lacks the information on the time horizon investigated: 2016 to 2035; or 2081-2100? [Government of Austria]	Clarified now.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11	39	11	42	If the time horizons are 2081-2100 information on the RCPs for which the statements are made need to be added. [Government of Austria]	Clarified now.
SPM	11	39	11	42	For the last statement (on cold winter extremes) a qualification of the likelihood is missing and should be added. [Government of Austria]	Rejected, no likelihood statement given in WG1 SPM
SPM	11	39	11	42	Instead of "on daily and seasonal time-scales" on all time-scales should be used. It is needless to say that "cold winter extremes will continue to occur" since cold summer extremes could occur as well. [Government of Hungary]	Rejected, this is approved WG1 SPM text
SPM	11	40		41	RETAIN: "It is very likely that heat waves will tend to occur more often and last longer..." ADD: harming populations and causing additional harm to crops. ADD: Emergency. [Peter Carter, Canada]	Rejected, this section is about change in the climate system, Impact section is next
SPM	11	41	11	41	How is "occasional" defined? [European Union]	This is approved WG1 SPM text
SPM	11	41			delete "tend to" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Sentence changed to fully follow WG1 SPM version
SPM	11	42			Add "The contrast in precipitation between wet and dry regions and between wet and dry seasons will increase." (This is a quote from WG1 SPM) [Government of United Kingdom of Great Britain & Northern Ireland]	Statement on precipitation has been added
SPM	11	42	13	1	We think statements on changes in precipitation and the carbon cycle are merited here. We suggest: "Precipitation will increase in high latitudes and the Pacific tropics and decrease in many mid-latitude and subtropical dry regions (likely under RCP8.5). Extreme precipitation events over most mid-latitude and tropical will very likely become more intense and more frequent with rising temperatures. Both the area and the intensity of the monsoon will increase and precipitation variability caused by El Niño will increase (likely). Land and ocean will become less effective in storing carbon from the atmosphere (high confidence). {{2.4.2, 2.4.4}} [Government of Netherlands]	Statement on precipitation has been added, statement on ocean acidification has also been added.
SPM	11		11		Fig SPM 5 b. Very difficult to read in current resolution. [Government of Sweden]	Revised figure is clearer, less labels.
SPM	11		11		Figure SPM.5. Request the clarification of the roles of stars in Figure SPM.5. Are they representing the values of 4 RCPs in 2100? Also request the clarification about 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]	Revised figure has no stars anymore
SPM	11		11		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]	Revised figure has no stars anymore
SPM	11		11		Figure SPM 5 b) There are two x-axes. It is somewhat confusing. Please, only use CO2, and explain the conversion to C in the glossary. Please, enlarge the legend box. It is not clear what the red/orange/blue lines present. Please consider adding the RCP names next to the stars. [Government of Finland]	Top axis are GtCO2 bottom axis are GtC, as in WG1 SPM

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11		11		Figure SP5.B. The bottom and top X axis labels are almost the same, except the scale and the unit. When do you use one or another? [Government of Chile]	Top axis are GtCO2 bottom axis are GtC, as in WG1 SPM
SPM	11		12		add current emission compared to RCPs (see graph from Appendix 3 of US Climate Impact Assessment)? And add when 2 degrees level will be passed for current trend [Government of Netherlands]	Revised figure has current emissions
SPM	11				Perhaps explain why the IPCC included a emissions scenario most observers holds as very unlikely (RCP2.6) [Government of Sweden]	Likelihood of scenario is not assessed here
SPM	11				the y-axis label is not consistent with a label in SPM.3. Should a label be "CO2 Emission (GtCO2eq/yr)". [Government of Netherlands]	Rejected, it is CO2 emissions, not CO2 eq.
SPM	11				overlap of variability or uncertainty for each RCP is unclear. Maybe use different lines, such as dashed ones. [Government of Netherlands]	Unclear comment. Hopefully the revised figure addresses that comment.
SPM	11				Legend in figure B) is too small and unreadable as well as text in a graph. Please increase a size. [Government of Netherlands]	Revised figure is clearer
SPM	11				Figure SPM.5 (a). It is very informative with a figure that combines the RCPs and the WGIII scenarios. For ease of understanding please consider adding a legend indicating which colored area corresponds to which WGIII scenario or perhaps the figure could be constructed in the same way as SYR figure 3.2 (page 77, upper panel). Figure SPM.5 (b). Would also suggest to delete SPM5 (b). This figure is difficult to read, especially when part of a two-diagram chart and there is in any case a reference in line 19 to the figure (SYR figure 2.4 in the underlying text). [Government of Norway]	Revised figure has same colours for WG3 scenarios
SPM	11				Figure SPM.5B. This figure is too little as it is now. In addition, is it necessary to have the large black stars (MAGICC) in this figure? It could be very confusing for policymakers. [Government of Norway]	Revised figure is clearer
SPM	11				Figure SPM 5: (b): The Colour Key labels as well as axes and title labels are very faint. Consider increasing the font size or making them bold [Government of Kenya]	Revised figure is clearer
SPM	11				Fig SPM-5(b) is far too detailed and complex for most policy-makers (who will read only the SPM). The main message of this figure (which is in lines 17-26) can be conveyed by the lines and shaded band alone. The stars and 'triangles' (which just look like coloured dots) are details that have been rightly included in Fig 2.4 of the main report, to which reference can be made in the caption of Fig SPM-5 [Tony Weir, Australia]	Revised figure is clearer
SPM	11				• SPM [P11] Figure SPM 5 X-axis should be drawn in graph (A) to make clearer the negative emissions. In graph SPM.4 of the WGIII, the Y-Axis represents annual GHG emissions, not CO2 emissions. Therefore, the Y-Axis label should be changed to make this clear. There seems to be a discrepancy between the Y-Axis figures and those in WGIII SPM Figure SPM.4. [Government of Saudi Arabia]	Zero line has been added on panel a to better show negative emissions. This figure is CO2 emissions only, not CO2eq.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	11				Fig. SPM5. I would really like another figure or panel near fig. spm5(a), in which the current (historical; black line) EO2 emissions are plotted versus the last IPCC scenarios. I would like that it is clear where we stand now in relation to the previous scenarios. [Alessandra Conversi, United Kingdom]	The black line in panel a and the black ellispse in panel b show historical emissions.
SPM	11				Figure SPM.5.. These figures are very important, and they contain such amount of information that they deserve half a page each. The current size does not allow to interpret them. [European Union]	Revised figure is clearer
SPM	11				figure SPM 5 (b): It should be clarified that the same colours are used as in figure SPM.5 (a) for the same scenario category. [Government of Austria]	Revised figure has same colours for WG3 scenarios
SPM	11				figure SPM 5 (b): It is suggested to use only one metric to describe cumulative total anthropogenic CO2 emissions: GtCO2 or GtC throughout the Synthesis Report, but not two because this use of two metrices only will confuse the reader. [Government of Austria]	Top axis are GtCO2 botton axis are GtC, as in WG1 SPM
SPM	11				Figure SPM.5 Please use the same units for the text and for Figure SPM-5. The text refers to GtCO2. The figure refers to GtC (x axis of Figure SPM5-B). Although the x-axis is also indicated in GtCO2 (at the top of the graph), this may create some confusion. The y-axis of Figure SPM5-A is apparently in Gt CO2 per year (please specify and use a single unit in both figures) [Government of France]	Top axis are GtCO2 botton axis are GtC, as in WG1 SPM
SPM	11				Figure SPM.5: panel B of this figure is interesting, but too complex to be easily understood for non specialists. Could it be simplified to convey only the important message and not all the details? In particular the date and triangles are not visible, and the color also quite confusing. This one should be tested on color blind persons. [Government of France]	Revised figure is clearer
SPM	12	0	12	0	both graphs: (in the centre of each graph) instead of the mean over 2081-2100, just show the projection for 2100. (more clear for the reader because it lines up with the left graphs, and because the difference between RCP scenarios is larger) [Government of Netherlands]	Rejected. Time series show projections to 2100, but side bars show 2081-2100 asgiven in the text and in topic2 text and table 2.1
SPM	12	0	12	0	bottom graph: replace "change" with "rise" (to indicate the main direction of change) [Government of Netherlands]	Rejected. Change is the adopted, more neutral wording
SPM	12	0	12	0	Figure SPM.6: add labels (temperature change & sea level rise) for y-axis (graphs) and scale bars (globes) [Lena Menzel, Germany]	Revised figure is clearly labeled now. Panels have a title, Y-axis only have units.
SPM	12	0	12	0	Figure SPM6, panel sea level change, scale bar below globes: blue colors, this has to be "-0.2" (a "minus" is missing before 0.2) [Lena Menzel, Germany]	Sea-level map has been removed from the SPM. Topic 2 figures is OK
SPM	12	1	12	1	Figure SPM 6. As for the map of change in annual mean sea level (bottom right panels), the Pacific is divided into two parts in a figure, and it is difficult to recognize characteristic of regional distribution. The Pacific would be located in the center of a figure like WG1 Fig. 13.20. If it is needed to maintain consistency with figures for temperature, all figures should be extended longitudinally to 540 degree width. [Government of Japan]	Rejected, map projections are as in WG1 SPM

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	12	1	12	1	Consider adding the number of CMIP5 models used for the RCP time series and bars to the left panels? Similarly it might be good to add the numbers for all RCPs to figure SYR 2.2 [Thomas Stocker/ WGI TSU, Switzerland]	Numbers of models are shown next to the time series, as in WG1 SPM
SPM	12	1	12	1	It is nearly impossible to see what is cross-hatched versus stipled. Please address this issue. [Government of United States of America]	Rejected, the hatching/stippling is as in WG1 SPM to avoid confusion
SPM	12	1	12	1	Figure SPM.6: The figure does not present temperature rise against pre-industrial levels. Readers might think that plotting temperature rises relative to 1986-2005 is a way of making the rise look less serious than if the table was about pre-industrial. If there has already been about -0.7 C warming since industrialisation, then the 2C limit could be passed around 2030-40, making mitigation and adaptation action rather more urgent. [European Union]	Rejected. All projections figures are relative to 1986-2005
SPM	12	1	12	1	Figure SPM6: How can the 20-year averaged mean sea level rise be not evenly distributed around the world? Also on page 13, at line 13 it should be explained. Suggest to delete the references to the non-RCP 2.6 and non-RCP8.5 scenarios on the y axis of the two charts on the left. [Government of Hungary]	Sea level rise is not uniform. See explanation in text and WG1 Chapter 13.
SPM	12	1	12	13	I can't see the difference between hatching and stippling in my high resolution print out. The upper two globes appear to be stippled or hatched everywhere and the lower two nowhere. Also if stippling shows where the multimodel mean is large compared to internal variability, AND where 90% of the models agree on the sign of the change, presumably it means this is the overlap of the Venn diagram of the two presumably different areas where those criteria are satisfied? [Rachel Warren, United Kingdom]	Revised figure SPM6 has temperature and precipitation, both with Stippling and hatching
SPM	12	1	12	13	could the very technical and unexplained term "CMIP5" be omitted in the caption? [Government of Denmark]	Accepted, CMIP5 removed from the caption
SPM	12	1	12	13	Figure SPM 6 - cannot detect difference between hatching and stippling [H-Holger Rogner, Austria]	Rejected, the hatching/stippling is as in WG1 SPM to avoid confusion
SPM	12	1	12	13	Figure SPM.6: Replot data using 1850-1900 as a baseline. [European Union]	Rejected. All projections figures are relative to 1986-2005
SPM	12	1			We propose to add a reference to Figure SPM.6 in the text of SPM. [Government of Germany]	Accepted, referred now
SPM	12	1			Figure SPM.6: The word "Global" in the headline of the bottom figure should be deleted (global mean sea level change is only shown in the left part of the figure). [Government of Germany]	Accepted, revised figure SPM6 shows time series only and figure SPM7 shows maps.
SPM	12	2	12	2	Figure SPM6 , no any description of sea level rise under different RCPs, just figure (bottom left).Move P13,line12-18 nearby here [Hui JU, China]	Description of sea level is in the next subsection
SPM	12	2	12	2	CMIP5? Isn't this unnecessary jargon, that is probably incomprehensible to many? [Keith Shine, United Kingdom]	Accepted, CMIP5 removed from the caption
SPM	12	2	12	2	First time mention of CMIP5 - change to Coupled Model Intercomparison Project Phase 5 (CMIP5) [H-Holger Rogner, Austria]	Accepted, CMIP5 removed from the caption
SPM	12	2	12	13	Figure SPM 6 is not referred to in the text at all. [Government of Sweden]	Accepted, referred now

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	12	2	12	13	Figure SPM.6: This figure seems to be referred in page 11 (line 28 ~ 42) but there is not indication of the Figure SPM.6 in related paragraph, sentences or lines. Please identify where this figure is cited in the context. [Government of Republic of Korea]	Accepted, referred now
SPM	12	2			This is the first instance in which CMIP5 is mentioned. Suggest adding a footnote or explanation. [Government of Canada]	Accepted, CMIP5 removed from the caption
SPM	12	2			Please explain "CMIP5" [Government of Germany]	Accepted, CMIP5 removed from the caption
SPM	12	6	12	6	Figure SPM 6. Caption of Figure SPM.6: Position of map is reversed. "RCP2.6 (top map) and RCP8.5 (bottom map)" should be "RCP2.6 (bottom map) and RCP8.5 (top map)" [Government of Japan]	Accepted, new figure SPM6 caption should be correct
SPM	12	6	12	6	Please note that RCP2.6 is the bottom map of each panel and that RCP8.5 is the top map. The text needs to be corrected accordingly. [Government of France]	Accepted, new figure SPM6 caption should be correct
SPM	12	7	12	7	"annual mean sea level" should be "annual mean sea level change." [Government of United States of America]	Accepted.
SPM	12	9	12	13	Please specify if the hatching and stippling applies only to the temperature change projections, and not also to sea level rise projections. [Government of Sweden]	Sea level map has been removed from the SPM
SPM	12	9	12	13	Recommend finding plainer language to describe the stippling and hatching. Readers will not easily know whether stippling and/or hatching are good or bad. Also, there is no visible stippling or hatching on the lower panels (SLR) so this needs explaining. [Government of Canada]	Rejected, the hatching/stippling is as in WG1 SPM to avoid confusion
SPM	12	9		12	Figure SPM.6 The caption explanation of the meaning of the hatching in this figure is not clear. What message should policymakers take from the information represented by the hatching? [Government of Ireland]	Rejected, the hatching/stippling is as in WG1 SPM to avoid confusion
SPM	12	9			Not clear what "hatching" is and where it is shown in the figures [Government of Netherlands]	Rejected, the hatching/stippling is as in WG1 SPM to avoid confusion
SPM	12	10			Not clear what "stipling" is and where it is shown in the figures [Government of Netherlands]	Rejected, the hatching/stippling is as in WG1 SPM to avoid confusion
SPM	12	12	12	12	Figure SPM 6. Missing "(" before "see WGI, Box 12.1)". [Government of Japan]	Accepted
SPM	12	12	12	13	The information about how to obtain the changes relative to preindustrial level should be added (+ 0.61 °C and + 0.19 cm for temperature and sea level rise, respectively). [Government of Germany]	Rejected. This is impossible to do for spatial projection of temperature and precipitation (or sea level as in the FOD).
SPM	12	12			"All changes are relative to 1986-2005". So average surface temperature and mean sea level change were constant in that period? According to other parts of the report these are not the case. [Government of Netherlands]	Rejected, a change relative to a reference period (1986-2005 here) does not mean that temperature (or sea level) were constant at that period.
SPM	12	12			Editorial: Missing left parenthesis for (see WGI, Box 12.1). ' [Government of Canada]	Accepted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	12	13	12	13	(Figure 2.2, Figure 2.3) should be written between braces {} because it refers to something outside of the SPM [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
SPM	12		12		Fig SPM 6. The abbreviation CMIP is first used here and should be explained. [Government of Sweden]	Accepted, CMIP5 removed from the caption
SPM	12		12		Figure SPM.6: Review the text since the references to the top and bottom maps seem to be changed, and the coloured vertical bars seem not to match with the corresponding shading range [Government of Spain]	New figures addressed this comment
SPM	12		12		Insert figure SPM.8 (b) WG1 SPM on projected changes in rainfall. [Government of United Kingdom of Great Britain & Northern Ireland]	Accepted, new figure SPM6 shows change in precipitation
SPM	12		12		<p>This section may be the only document that certain audience reads about climate change. Due to its controversies, IPCC and others have to keep on defending its works, and increase credibility of statements. Therefore, some information in the introduction would be useful that presents</p> <ul style="list-style-type: none"> - how IPCC works, what it does (i.e., literature review plus a stringent process of reviewing its reports), - that IPCC contributes to the organization of climate modelling, - that it assesses uncertainties and gaps in our report, and - that it presents "best available knowledge" on the issues considered. <p>Some of this methodology is unique, but is certainly based on the scientific method, and should be described in order to increase the credibility.</p> <p>This description should not be long, and could take the place of some redundancy in the report. I believe that this section is necessary even if the issues are described in more details e.g. on the IPCC website.</p> <p>Finally, a link should be made with Art. 2 of the UNFCCC (see very last Box on pages 118-120), the Kyoto Protocol (which was designed based on IPCC reports), but ALSO WITH METHODOLOGICAL REPORTS OF IPCC TO ESTIMATE GHG EMISSIONS AND REMOVALS (i.e., THE TASK FORCE OF IPCC ON GHG INVENTORIES). This would then describe the overall framework of how climate change is currently addressed at the global level. Developing even a nice chart showing all these elements of our climate change management could set the stage for the findings of AR5. [Government of Hungary]</p>	A section describing scenarios, models and confidence is presented in topic 2.1 and boxes 2.1 and 2.2. There is also an Article 2 box describing climate changes in the context of the UNFCCC article 2
SPM	12		13		for sea level period till 2300 needed [Government of Netherlands]	Rejected. Changes beyond 2100 are described in section 2.4 of the SPM
SPM	12				We suggest making the pre-industrial level the reference in figure SPM6 and elsewhere in this section. [Government of Netherlands]	Rejected. This is impossible to do for spatial projection of temperature and precipitation (or sea level as in the FOD).
SPM	12				We support inclusion of these useful figures, and larger maps would make it easier to distinguish "hatching" and "stipling" [Government of New Zealand]	Accepted, new figure SPM as larger maps.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	12				Figure SPM.6. Please consider to include information regarding temperature and sea-level changes from pre-industrial level and to the present reference periode (1986-2005). 0.61 °C and 0.19 m for temperature and sea-level rise, respectively. [Government of Norway]	Rejected. This is impossible to do for spatial projection of temperature and prcipitation (or sea level as in teh FOD).
SPM	12				Figure SPM.6. It is a pity that the maps for precipitation changes are not shown in place of the maps for sea level change. These last indeed poorly reflect the level of uncertainty on sea level change at the regional scale. The precipitation changes are also important in term of climate change impact and corresponding maps (WGI report, SPM.7, b) reflect the level of agreement in the multi-model ensemble and the amplitude of the change (as it is explained for the temperature maps). It seems that the choice is guided by the symetry of the figures associating global mean evolution and maps of changes with the two scenarios. But this should not be determinant. [Serge PLANTON, France]	Accpeted, new figure SPM6 shows change in precipitation
SPM	12				Consider deleting SPM.6. It's confusing, because it shows warming relative to 1986-2005 whereas the text on previous page describes warming relative to 1850-1900. (see comment relating to page 11 lines 33-37) [Government of United Kingdom of Great Britain & Northern Ireland]	Rejected. Projection maps are relative to 1986-2005 as in WG1 SPM. A reference to pre-industrial cannot be done for spatial projection of temperature and prcipitation (or sea level as in the FOD).
SPM	12				Figure SPM.6: the titles of the figure should read: "Projected change in average surface temperature" and "Projected global mean sea level change" [Government of Switzerland]	Rejected. Title is already quite long. The current title is as in WG1 SPM.
SPM	12				Figure SPM.6 should be referenced in the SPM text. [Government of Switzerland]	Accepted, it is referenced now.
SPM	12				Figure SPM.6: The colours for RCP4.5 and 6.0 should be changed in order to enhance the readability. [Government of Austria]	Rejected, colours of RCPs are as in the underlying WGsSPMs.
SPM	13	6	13	10	These assessments lack the information on the time horizon investigated: 2016 to 2035; or 2081-2100? Mid-century? [Government of Austria]	time information now given above for these results
SPM	13	16	13	18	Additional text should be added to reflect the large role that non-climate stressors can play in exacerbating vulnerabilities (e.g., paving floodpains; subsidence through groundwater pumping; etc.). The role of non-climate/ multiple stressors in amplifying vulnerabilities was a key finding of the WG2 report. [Government of United States of America]	this material moved to section 2.3
SPM	13	20	13	20	Change bullet to read 'Climate change will create new risks for natural and human systems, as well as amplifying exitsing ones' [Rachel Warren, United Kingdom]	Given that risk amplification is an essential component of how risks will change, it has not been made secondary within the sentence.
SPM	13	20	13	20	{2.5} could be removed on the first line of the paragraph because it is already at the end of the paragraph (line 25) [Thomas Stocker/ WGI TSU, Switzerland]	The redundant reference has been removed.
SPM	13	20	13	20	This setence comes from 2.5 which states "Climate change is projected to amplify..", the statement in the SPM states it a bit stronger "Climate change will...". [Government of Netherlands]	"Will" is supportable based on the assessment made, as summarized in this section.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	20	13	20	This is the first time in the SPM that risks of climate change are addressed in some detail. It is suggested to include a footnote explaining that the SYR characterizes risks related to climate change from very low, low, medium, high to very high. Other qualifications such as "considerable" (e.g. page 13, line 18) should be avoided. [Government of Austria]	These risk levels are most relevant to figure SPM.7, where they are specified.
SPM	13	20	13	20	This statement is very important. Unfortunately it does not provide the full picture - because this statement is true even in case of significant efforts related to adaptation and mitigation, as SPM WG II AR5 in Assessment Box SPM.2 Table 1 demonstrates. The text should be amended accordingly. [Government of Austria]	Limits to adaptation are now highlighted within the headline. The mentioned table is encompassed within figure SPM.7.
SPM	13	20	13	22	Suggested to modify text to "[...]causing mostly negative consequences for biodiversity and ecosystem goods and services (high confidence)" [Tabaré Arroyo Currás, Mexico]	This phrase is no longer included.
SPM	13	20	13	22	Suggested to include after "[...]negative consequences for biodiversity[...]" "(i.e., including but not limited to, extensive loss)" [Tabaré Arroyo Currás, Mexico]	This phrase is no longer included.
SPM	13	20	13	23	The summary mentions "mostly negative consequences for biodiversity and ecosystem service". This was mentioned elsewhere in the same document, but for a different response variable. Is there some way to create a table that summarizes the negative and positive responses? For example: Column 1 Title = positive effects and column 2 Title = negative effects. Row Title (response variable) = Biodiversity. That way we could see easily and quickly what the potential or observed negative and positive impacts are. [Government of United States of America]	This phrase is no longer included.
SPM	13	20	13	24	In the first bold sentence, please consider to reflect the concrete impacts from sentence number 2 and 3 in the para. [Government of Norway]	The headline section has been kept general, with specific examples provided in the paragraph that follows. Given the need to keep headline statement short, this approach was necessary.
SPM	13	20	13	25	Add the following text from WGII SPM as a separate strong bullet for ecosystems "A large fraction of terrestrial and freshwater species faces increased extinction risk under projected climate change under all RCP scenarios, with risks increasing with both magnitude and rate of climate change". [Rachel Warren, United Kingdom]	Extinction risk is now treated at length in an added paragraph.
SPM	13	20	13	25	I see that the bullet is meant to combine the impacts on ecosystems and ag. I don't think this should be done - there needs to be a very strong headline message on impacts on ecosystems that stands out in the SPM - as many policy makers will only get this far. So this is very important. They may not read that you have included this text further on in the SPM. [Rachel Warren, United Kingdom]	Separate paragraphs on ecosystems and agriculture are now included.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	20	13	25	In second last sentence in this paragraph, suggest replacing "not only in developing countries" with "globally" or "in all countries". This final sentence is has relevant information and could be integrated with the bolded statement for this paragraph. It may also be helpful to provide examples of benefits generated. [Government of Canada]	The phrase used is now "in both developing and developed countries," within the headline statement for the section.
SPM	13	20	13	25	Suggest revision. The text presented in this point should be aligned with the corresponding heading in Section 2.5, including reference to Section 2.5.2 in relation to lines 23-24. [Government of Australia]	The introductory paragraph for this section is now well aligned with the underlying 2.3.
SPM	13	20	13	25	This is all very vague. These statements would be stronger if additional explanation were provided. [Government of United States of America]	The headline section has been kept general, with specific examples provided in the paragraph that follows. Given the need to keep headline statement short, this approach was necessary.
SPM	13	20	13	36	We support the inclusion of these statements with respect to climate change risks to natural and human systems (biodiversity) and impacts on unique and threatened systems and species extinction. [Government of New Zealand]	Thank you. Ecosystem risks have been further emphasized in an added paragraph.
SPM	13	20	14	20	Please rearrange these individual paragraphs to stop confusing the difference between impacts and risk. Re-sort them into two sections. Put risks after impacts since risk incorporates more than just impacts. [Government of United States of America]	Throughout, the assessment is focusing on risks of climate change impacts, recognizing that both emerge from the overlap of hazard, vulnerability, and exposure.
SPM	13	20		24	RETAIN: "Climate change will create new and amplify existing risks for natural and human systems. There is high risk of substantive impacts on terrestrial and aquatic ecosystems as [a] result of climate change, causing mostly negative consequences for biodiversity and ecosystem services (high confidence). Throughout the 21st century, climate change will further challenge food, livelihood and human security and wellbeing, not only in developing countries." ADD: Emergency. [Peter Carter, Canada]	The 1st statement has been retained and changed into a headline statement. Parts of the 3rd sentence has been incorporated into it. The 2nd sentence has been further emphasized through the addition of a paragraph on ecosystems.
SPM	13	20			Delete "{2.5}" from the end of the first sentence. It is included at the end of the paragraph. [Government of New Zealand]	This has been deleted.
SPM	13	22	13	22	space at wrong side of dot. [Government of Sweden]	Corrected.
SPM	13	22	13	22	"Negative consequences" is a normative and vague statement. Should be replaced with a more objective and informative statement. [Government of United States of America]	More specific adjectives are now used in the paragraphs following the headline statement.
SPM	13	22	13	24	It is stated : "...not only in developing countries". On page 65 line 26 {2.5} the same sentence ends with "... not only in low-income countries" is used. Why changing low-income to developing countries at the level of the SPM? The text needs to be consistent between SPM and SYR, and consistent with underlying WG assessment. [Thomas Stocker/ WGI TSU, Switzerland]	The phrasing in the headlines here and in 2.3 has been harmonized.
SPM	13	22	13	24	The formulation of the end of the sentence is not clear: why use the negative? Why single out "developing countries"? [Government of France]	Improved wording has been used: "in countries at all levels of development."•

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	22	13	25	This statement makes heavy handed assertions about the consequences of climate change, however, it cites no scientific arguments or confidence levels. Revise or remove. [Government of Netherlands]	Where confidence levels are not used, it is because the statements are factual or definitional.
SPM	13	22			The expression "mostly negative" is not appropriate given the risk of "substantial species extinction" due to climate change mentioned some lines below, and the many references to biodiversity and ecosystem services in the key risks and the reasons for concern. The subclause starting with "causing mostly negative..." should therefore be replaced by a sentence mentioning these risks: "causing high to very high risks for biodiversity and ecosystem services, see [reference to key risks and reasons for concern]." [Government of Germany]	This phrase is no longer used. More specific examples and adjectives have been used instead, with a full paragraph on ecosystems now included.
SPM	13	23	13	23	For clarity we suggest to add "production" after "food". [Government of Netherlands]	This ambiguous phrase is no longer used here.
SPM	13	23	13	23	Well-being is a normative and vague term. Should be replaced with a more objective and informative statement. [Government of United States of America]	Please note that "well-being" is an important descriptor of assessed characteristics. At the same time, it is no longer used in the introductory paragraph here.
SPM	13	23	13	24	"Not only in developing countries" change to "significantly in developing countries". [Hui JU, China]	The emphasis here has been changed to a broader statement about risks and changes in them "in countries at all levels of development."•
SPM	13	23	13	24	While climate change affects countries to varying degrees in fields of food, livelihood, human security, etc., developing countries are more vulnerable. It is suggested, therefore, that "not only in developing countries" be reworded as "especially in developing countries". [Government of China]	The emphasis here has been changed to a broader statement about risks and changes in them "in countries at all levels of development."•
SPM	13	23	13	24	We propose to replace the phrase "not only in developing countries" by "worldwide". [Government of Germany]	A change to this effect has been made: "in countries at all levels of development."•Please see the revised headline statement for the section.
SPM	13	23	13	24	Following the word "well-being", remove the words "...not only in developing countries." and replace it with "worldwide". [Government of United States of America]	Improved wording has been used in the headline statement: "in countries at all levels of development."•
SPM	13	23	13	24	The mention to "not only in developing countries" seems out of place, since there is no comparison with developed countries in the context of the sentence. Consider deletion. [Government of Brazil]	The comparison intended in the headline statement is now better described: "in countries at all levels of development."•
SPM	13	23	13	24	Delete and include the followin in red. not only mostly in developing countries. This is because adaptation is mostly a problem of developing country parties. [Government of Bolivia]	The emphasis here has been changed to a broader statement about risks and changes in them "in countries at all levels of development."•
SPM	13	24	13	24	Please delete "not only in developing countries" the clarification is not necessary in a general statement. [Carlos Méndez, Venezuela]	This has instead been broadened in the revised headline statement: "in countries at all levels of development."•

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	24	13	24	"climate change will reduce some risks": do you mean climate-related risks or all kind of risks in general? Please specify. [Government of Norway]	The scope is implied, within the clarified introductory paragraph: climate-related risks are being referred to.
SPM	13	24	13	24	Need to explain this further or else it is misleading and one can interpret that climate change will generate benefits in some regions [Government of India]	This sentence has now been deleted.
SPM	13	24	13	24	There is hanging incomplete information in "well-being, not only in developing countries." but also in what? [Government of United States of America]	This phrase has been clarified in the revised headline statement, which now describes risks more broadly.
SPM	13	24	13	24	Please include examples at the end of the following statement: "To a lesser extent, climate change will reduce some risks and generate benefits." [Government of United States of America]	This sentence has now been deleted.
SPM	13	24	13	24	How can climate change reduce risks and how can it generate benefits? Should be more precise or this less meaningful sentence should be neglected. [Government of Hungary]	This sentence has now been deleted.
SPM	13	24	13	24	"To a lesser extent, climate change will reduce some risks and generate benefits": this sentence is not giving much information. Some examples might be useful. [Government of France]	This sentence has now been deleted.
SPM	13	24	13	25	this statement is much more adamant than the underlying statement in SYR 2.5 page 60 line 6-7 ("projected to have some potential benefits"). Suggestion: "To a lesser extent, climate change may reduce some risks and may generate some benefits." (so repeat "some" for the benefits and reflect the "potential" by using "may" in stead of "will") [Government of Netherlands]	This sentence has now been deleted.
SPM	13	24	13	25	Suggested to substitute the phrase "To a lesser extent, climate change will reduce some risks and generate benefits" with the phrase "To a lesser extent, climate change is also projected to have some potential benefits." as literally taken from WG2-B2 section. [Tabaré Arroyo Currás, Mexico]	This sentence has now been deleted.
SPM	13	24	13	25	Some specification is needed for 'reduce some risks and generate benefits'. E.g., what are the benefits? [Government of Switzerland]	This sentence has now been deleted.
SPM	13	24	23	24	The sentence "To a lesser extent, climate change will reduce some risks and generate benefits" is given. However, it seems that the only sentence treating this topic in Section {2.5} is "Globally, positive impacts are projected to be outweighed by the magnitude and severity of negative impacts (high confidence)" (p.66 lines 35-36). We thing that this sentence is actually stronger and comes with a confidence statement attached, so it could also be used in the SPM. [Thomas Stocker/ WGI TSU, Switzerland]	This sentence has now been deleted.
SPM	13	24	23	24	2.5.2 should be added to the line of cite, because the last sentence of the paragraph comes from a sentence in 2.5.2 (see previous comment) [Thomas Stocker/ WGI TSU, Switzerland]	Referencing has been improved accordingly.
SPM	13	24			Provide a few examples of benefits and reduces risks. And why "lesser extent". [Government of Sweden]	This sentence has now been deleted.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	24			this sentence is very general, please provide some examples for risk reductions and benefits. For clarity we suggest to insert "some" in front of "benefits". [Government of Netherlands]	This sentence has now been deleted.
SPM	13	24			Developing countries' to 'more vulnerable countries'. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	A broader finding on risks is now provided "in countries at all levels of development."•
SPM	13	24			To a lesser extent, climate change will reduce some risks and generate benefits.' is a very nonspecific sentence. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	This sentence has now been deleted.
SPM	13	25			This paragraph should also refer to Section 2.5.2, as this is where the potential benefits are mostly presented [Government of Ireland]	A broader reference is now provided.
SPM	13	27	13	27	This lead bold sentence should be the lead for the paragraph above this one and the "Risk" one (p.13 l.20) come down to where risk is defined. [Government of United States of America]	This sentence is now incorporated into the overall headline for the section, and into the previous paragraph although not as the 1st sentence.
SPM	13	27	13	27	Irreversible implies a level of confidence wholly unjustified by the methods used to make the prediction. [Government of United States of America]	This adjective occurs within the working group 2 summary for policymakers and is thus used here as well.
SPM	13	27	13	36	Although WGII has exemplified climate change impacts for two distinct temperature levels, risks change successively with temperature change (cf. for example with the RfC presentation). This would be useful to express more clearly, so that one does not get an impression of stepwise character of changes. [Government of Sweden]	This has been emphasized in the revised introduction here, with no sharp gradients implied.
SPM	13	27	13	36	This paragraph would be better placed if it were moved down (suggest moving it to precede line 12 on page 15). The information in these lines fits better with the discussion of irreversible change on lines 12-28 on page 15. The text on page 13 lines 38-54 and page 14 lines 1-24 seems to align better with the bolded conclusion on page 13 line 20 (climate change will create new and amplify existing risks....) than with that on lines 27-28 (severe, pervasive and irreversible impacts). This information could also be linked to Figure 9D and the reasons for concern. [Government of Canada]	This material has been much better integrated into the introduction for this section.
SPM	13	27	13	36	It would be useful to place figure SPM.9 here [Government of United Kingdom of Great Britain & Northern Ireland]	Figure 9 (now as Figure SPM.10) has been revised to further emphasize its connection to the assessment of mitigation, which is most appropriately summarized later in the SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	27	13	36	It is our impression that the clear and logical presentation of key risk, thresholds and reasons for concern in WG2 SPM has been somewhat lost in SYR. Please seek way for presenting a coherent story throughout the report. For example, the paragraph starting on line 27 actually refers to figure SPM.9 in section 3.3 (and to the text starting on line 14 on page 22) without mentioning it. Perhaps Figure SPM 9 should be here? Similarly, on line 30 the term "reasons for concern" is used but not explained. [Government of Finland]	The connection between key risks and reasons for concern is now extensively laid out in the underlying 2.3, with only room here for a brief reference to the richness of that assessment.
SPM	13	42	13	42	A possible typo; "temperature" should be "temperate"? [Government of Sweden]	Corrected to 'temperate regions'.
SPM	13	42	13	42	"tropical and temperature regions" should be replaced with "tropical and temperate regions" [Government of Denmark]	Corrected to 'temperate regions'.
SPM	13	42	13	42	Replace "temperature regions" with "temperate regions". [Government of Canada]	Corrected to 'temperate regions'.
SPM	13	42	13	42	The word " Temperature" in this sentence should be changed to " Temperate" [Government of Kenya]	Corrected to 'temperate regions'.
SPM	13	42	13	42	"temperature regions" should be changed to "temperate regions". [Keigo Akimoto, Japan]	Corrected to 'temperate regions'.
SPM	13	42	13	42	Replace 'temperature regions' by 'temperate regions' (likewise page 65 line 44 and page 66 line 3) [Government of Switzerland]	Corrected to 'temperate regions'.
SPM	13	42	13	42	Please replace "temperature" by "temperate" [Government of Belgium]	Corrected to 'temperate regions'.
SPM	13	42	13	42	"For the major crops (wheat, rice, and maize) in tropical and temperature regions" should probably read "in tropical and temperate regions". [Government of Brazil]	Corrected to 'temperate regions'.
SPM	13	42	13	42	"...and temperature regions." We assume the authors meant "temperate regions". Please fix accordingly. [Government of United States of America]	Corrected to 'temperate regions'.
SPM	13	42	13	42	Temperate not temperature [Elvira Poloczanska, Australia]	Corrected to 'temperate regions'.
SPM	13	42	13	42	temperate! [Peter Thorne, Norway]	Corrected to 'temperate regions'.
SPM	13	42	13	42	Replace 'temperature regions' by temperate regions. [Government of France]	Corrected to 'temperate regions'.
SPM	13	42	13	44	for clarity rewrite sentence "Production of major crops (wheat, rice and maize)" in tropical and temperate regions is projected to suffer under local temperature increases of 2°C or more above late-20th century levels without adaptation, although individual locations may benefit." [Jonathan Lynn, Switzerland]	The text is directly off the SPM approved text,, except for 'the major crops'. We don't usually use words like 'suffer'.
SPM	13	42	13	44	As written, this leaves the impression that under 2 degrees C warming, impacts will be neutral or positive: is this implication accurate? If not, that should be addressed. [Government of United States of America]	Below 2 degree warming, the impacts vary considerably (for crops and location), but above 2 degrees, the picture becomes clearer for these 2 major crop regions. The text builds directly off the approved text in the WGII SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	42	13	45	Why give impacts without adaptation? These are of academic interest only. Please give impacts with adaptation. [Richard Tol, United Kingdom]	As explained by the chapter authors, confidence about how adaptation was treated in the underlying data sets was rather low and hence didn't justify inclusion here.
SPM	13	42	13	45	This information is important. Please also provide information on what share of these crops are presently produced in areas that are projected to experience more than 2 C warming by 2100. As global warming is not uniform (over oceans warming will be less than global average, and over land warming will be more than the global average), 2-3 degrees global average warming this century could lead to significantly warming above 2-3 degrees in areas that produce the bulk of global crops. Please also consider if policymakers could be informed to what extent those regions most at risk for negative impacts on crop yields are also the regions that are most at risk in terms of food security both terrestrial and marine systems. [Government of Norway]	This more detailed information is available in the underlying chapter of WGII (Ch7), but for reasons of space constraints can't be included in the very short SPM for the SYR.
SPM	13	42	13	45	Is this paragraph reflecting the information in the paragraph from SPM WGII on "Food security and food production systems?" Please consider making a statement in bold summarizing the effects of climate change on food security. Please also consider including a statement that reflects the importance in changes in global fisheries on food security. For example from WGII SPM page 18: "Redistribution of marine fisheries catch potential towards higher latitudes poses risk of reduced supplies, income, and employment in tropical countries, with potential implications for food security (medium confidence). {WGII SPM}" [Government of Norway]	This paragraph draws directly from text approved in the WGII SPM, stemming from the underlying Ch 7, yes. No bold text in the SPM here for major findings. A short statement on fisheries was added (from underlying findings in Ch 6 Ocean systems).
SPM	13	42	13	45	The phrase "[...] although individual locations may benefit (medium confidence)." can be taken out of context by climate sceptics. Although the phrase has been literally taken from WG2-B2, underlying text in that section provides additional relevant info. that makes it fit into right context. It is suggested that phrase is either removed or characterized by an "level of agreement" qualifier. [Tabaré Arroyo Currás, Mexico]	This is indeed the approved text from the WGII SPM. More details on locations that may benefit are found in the underlying chapter. The SYR SPM, for page constraints, cannot provide these additional details.
SPM	13	42	13	45	Moving back and forth between "preindustrial" and "late-20th century levels" is quite confusing. The Figure SPM.7 cited here refers to pre-industrial yet the text mentions late-20th century, which itself is not defined. Is the 1986-2005 period sometimes referred to as late-20th century in the SYR? [Government of South Africa]	The text relies on underlying data sets and hence has to refer to late-20th-century levels, also in the figure. This was approved in the WGII SPM. The figure in the main text of the SYR and the approved WGII SPM both refer to late-20th-century levels.
SPM	13	42	13	45	The shift in reference time frame in this sentence away from pre-industrial is confusing. Can we frame this with regard to pre-industrial? [Government of United States of America]	The text relies on underlying data sets and hence has to refer to late-20th-century levels, also in the figure. This was approved in the WGII SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	42	13	45	To support this medium confidence statement, it is suggested to add: 'All aspects of food security are potentially affected by climate change, including food access, utilization and price stability (high confidence)' (WG2 SPM page 18). [European Union]	Thank you - now included.
SPM	13	42	13	45	Climate change impacts on livestock could be added here. It is an important component of agricultural impacts. [Government of France]	Livestock was not part of the approved text in the WGII SPM.
SPM	13	42		42	in tropical and temperate regions,~ temperate .. Most probably meaning temperate climate region instead of temperature region here. [Government of Hungary]	Typo has been corrected.
SPM	13	42		44	DELETE: "For the major crops (wheat, rice, and maize) in tropical and temperate 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." This would be about 2.4°C global mean from 1850, which is wrong and dangerously policy-misleading. INCLUDE SYR p. 68 Table 2.3 last section: "Negative impacts on average crop yields [...] due to climate change (high confidence) With or without adaptation, negative impacts on average yields become likely from the 2030s with median yield impacts of 0 to -2% per decade projected for the rest of the century, and after 2050 the risk of more severe impacts increases." INCLUDE FROM WG II, TS, p. 22: "Without adaptation, local [ADD: and global] temperature increases of 1°C or more above preindustrial levels are projected to negatively impact yields for the major crops (wheat, rice, and maize) in tropical and temperate regions.... With or without adaptation, climate change will reduce median yields by 0 to 2% per decade for the rest of the century." ADD: Emergency. [Peter Carter, Canada]	Unfortunately, we don't have the space to provide all details from the underlying chapters or technical Summary, or repeat text that is already well captured in tables. We are largely bound by text approved in the WG SPM which then needs to be further condensed and synthesized.
SPM	13	42			This is the first time "without adaptation" is mentioned. How should other statements about impacts be interpreted. Since figure SPM. 7 is included it is important to distinguish between impacts without or e.g. "high adaptation state". [Government of Sweden]	Yes, because the underlying Chapter 7, WGII, draws upon data sets that are explicit about future crop impacts without adaptation. Not all chapters have data sets that deserve confidence in the distinction between w/o adaptation (mostly they are without). Fig SPM7 is different as it assesses risks, based on author judgment of the underlying literature, at 2 levels of adaptation.
SPM	13	42			Please substitute "temperature" by "temperate". [Government of Germany]	Done.
SPM	13	42			including CO2 effects? I assume so but if so would be good to explicitly state this [Joanna House, United Kingdom of Great Britain & Northern Ireland]	No, CO2 effects are not included, and hence not stated in the figure caption. The underlying Ch7 in WGII explains why CO2 fertilization is not included in their analysis (mainly because of changes in other factors such as precipitation that differ between studies).

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	44	13	44	Please consider to include "some" before "individual locations" [Government of Norway]	It's essentially the same. Given space limitations, we eliminated all words that were not absolutely crucial for understanding the text.
SPM	13	45	13	45	The reference to a temperature increase above "late-20th-century levels" is surprising as the report generally presents temperature increases relative to pre-industrial levels, as does the Fig. SPM. 7 which the present text refers too. [Government of Sweden]	The text relies on underlying data sets and hence has to refer to late-20th-century levels, also in the figure. This was approved in the WGII SPM. The figure in the main text of the SYR and the approved WGII SPM both refer to late-20th-century levels.
SPM	13	45	13	45	Include the following: All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability (high confidence) [Government of Bolivia]	This specific sentence is now included in the main text of the SYR, given page limitations for the SPM.
SPM	13	47	13	48	Heat stress, extreme precipitation, sea level rise, inland and coastal flooding, drought, landslides, air pollution, and water scarcity pose not only risks in urban regions. Please change into: "... pose risks especially in urban regions ...". [Government of Germany]	Text has been modified.
SPM	13	47	13	50	It seems no need to state the confidence level here, as there is no doubt on the negative effects of these risks, with or without climate change. [Government of Switzerland]	Text has been modified to focus on the risks related to climate change, with the appropriate confidence level from the underlying chapter.
SPM	13	47	13	50	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]	Text has been modified to focus on the risks related to climate change.
SPM	13	47	13	50	This paragraph is absolutely correct and outlines the conclusions of the SREX report (IPCC, 2012) and the WGII report, but a short explanation to relate it with climate change would be necessary. In spite that for some risks there are still a low confidence, for other ones and for specific regions, the degree of confidence is major. [Maria Carmen Llasat, Barcelona]	Text has been modified to focus on the risks related to climate change.
SPM	13	47	13	54	Are these two paragraphs meant to be about impacts in urban and rural areas respectively? Why has landslides and air pollution only been mentioned in connection to urban areas and not rural also? [Government of United Kingdom of Great Britain & Northern Ireland]	Yes, the text refers to findings and confidence levels from the urban and rural chapter, respectively, but now combined into 1 paragraph. Landslides and air pollution have been removed.
SPM	13	48			people, economies, and ecosystems' to 'people, ecosystems, and economies' [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Done.
SPM	13	52	13	52	The word "will" should be changed to "is projected to" to be consistent with the WG2 SPM. [Government of United States of America]	Done.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	13	52	13	54	For an assertive statement like "Rural areas will....", one would expect that this is "virtually certain" and not stated with "high confidence" [Government of South Africa]	Changed to "projected to".
SPM	13	52	13	54	Under what RCP scenarios does this finding apply? Please clarify. [Government of United States of America]	This is a summary statement from Ch 9 WGII, drawing from a variety of studies using different models and scenarios.
SPM	13	52		53	RETAIN: "Rural areas will experience major impacts on water availability and supply, food security, infrastructure, and agricultural incomes." ADD: Emergency. [Peter Carter, Canada]	This text is straight from the SPM of WGII. The high confidence level signals evidence and agreement. The IPCC does not use an emergency language.
SPM	13	52			This paragraph is an example on impacts being very dependent on non-climate factors. How should this be handled? [Government of Sweden]	It is the chapter's responsibility to assess the magnitude of climate in contrast to non-climatic factors, based on the literature. More details in the underlying Ch 9 of WGII.
SPM	13	52			I suggest "Rural areas" should be replaced by "Some rural areas" or "Many rural areas", since the present unqualified statement implies all rural areas will experience major impacts on water availability and supply, food security, ..." [David Wratt, New Zealand]	We prefer to keep "rural areas" as the concept of risk already encompasses potentiality.
SPM	13		14		Not clear why certain statements are in bold (significant) and others not. [European Union]	There no longer is any bold text in the SPM for findings.
SPM	13		15		It is rather surprising that a reference to the Key Risks across regions and sectors, a key finding of the new WG2 report, does not find a placeholder in the SPM. [European Union]	Key risks are addressed before the sectoral examples and Figure SPM 7 on global key risks.
SPM	13		15		Marine systems are also highly vulnerable, and this is also a key finding of WG2 work. Reference to changes in species, ecosystems, fisheries and other ecosystem services (high confidence), acidification and its effects (medium to high confidence), and even figure SPM 6 (based on 1000 species!) could be considered here. [European Union]	We now address global marine-species distribution and fisheries in the SPM.
SPM	13				ADD to SPM: "Increased use of coal relative to other energy sources has reversed the long-standing trend of gradual decarbonization of the world's energy supply" (from SYR, p. 38, line 22-24). [Peter Carter, Canada]	This section in the SPM is about future impacts and risks from climate change, hence a treatment of coal does not fit here.
SPM	14	0	14	0	adaptation is not covered in this topic, thereby there is no context for the figure to show how adaptation can reduce risks. Please show only the risks without adaptation, and later show the figure including the reduced risks in spm 3, after adaptation has been discussed. [Government of Netherlands]	It is fundamental to discuss adaptation in an assessment of future risks, which is what this section of the SPM and the underlying text of the SYR do.
SPM	14	0	14	0	remove the "wildfire" symbol from the eastern USA and from the legend, because it occurs only once and also seems out of place in the list of "biological systems" that suffer impacts. [Government of Netherlands]	Wildfires are listed in the SPM approved table for North America with respect to loss of ecosystem integrity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	1	14	3	This para is too general to be useful as information for policy makers. What is meant by "impacts"? Would the statement be valid for any level of climate change? [Government of Sweden]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII. Impacts are clearly defined in the glossary of the SYR.
SPM	14	1	14	3	Ask for insertion of the following lines from AR5 WGII SPM P19, para3, as quantitative assessments will help policymakers to better understand projections of impacts on key economic sectors: Global economic impacts from climate change are difficult to estimate. Economic impact estimates completed over the past 20 years vary in their coverage of subsets of economic sectors and depend on a large number of assumptions, many of which are disputable, and many estimates do not account for catastrophic changes, tipping points, and many other factors. With these recognized limitations, the incomplete estimates of global annual economic losses for additional temperature increases of ~2°C are between 0.2 and 2.0% of income (±1 standard deviation around the mean) (medium evidence, medium agreement). [Government of Japan]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	This statement is a little bit counterintuitive or circular since climate change itself will impact some of the factors listed. A sentence to make this point could be added, for example: "However, climate changes will in itself also lead to changes in some of these parameters such as income, technology, regulation and governance". [Government of Norway]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	This sentence seems misplaced and its purpose is unclear. The differences in impacts between climate change and the other main drivers in the economy should be explained more thoroughly, including the indirect effects of climate change. [Government of Norway]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	Please add the information that increasing climate change poses additional stress and increases vulnerability. [Government of Germany]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	1	14	3	Could be phrased more positively as "For most economic sectors, climate change will cause additional stresses to those imposed by changes in population...and governance." This point (additionality) warrents highlighting the sentence. [Tony Weir, Australia]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	This is an important statement but needs more detail. It is also a little dismissive of climate change at the moment so we would suggest giving some better context to make it more balanced. For example, we suggest prefacing with a statement like "Climate change is one of several drivers that will have a significant influence on economic development over the coming decades". Importantly, also make the point that the influence of climate change will increase over time - as temperatures warm we expect to see more severe and widespread negative impacts. You might also make the important point that climate change is a threat multiplier so will interact with these other factors and in some cases aggravate them [Government of United Kingdom of Great Britain & Northern Ireland]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	Is the key point meant to be that other factors than climate change will be the primary economic drivers, even though line 17 states that climate change impacts are projected to slow down economic growth? It is unclear from the text how much of an influence climate change is expected to have, compared to the other factors identified here. The text could be expanded with WG2 SPM page 19 "Global economic impacts from climate change are difficult to estimate...." [Government of United Kingdom of Great Britain & Northern Ireland]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	Is this true for all scenarios and all time horizons? Can this be known beyond 2100, for example? [Government of United States of America]	The findings for this entire section refer to the 21st century, unless otherwise stated. The medium evidence/high agreement implies a level of uncertainty judged appropriate in the WGII SPM approval session.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	1	14	3	This paragraph should be removed, as it provides a very general and unclear statement. It does not clarify whether the impacts of other drivers are aggregated when compared to the impacts of climate change. Each economic sector will experience a major or minor impact of climate change, in each country and specific situation. The work of the vulnerability assessments consists precisely on identifying the importance of the climate change effects over the normal functioning of these systems, and identifying priorities for action upon these analyses. Providing a general statement minimising the role of climate change, in general, does not help as it sends a confounding message that climate change is only a minor threat. The same kind of statement could be built for all other drivers: substitute climate change by age structure, income or any other driver in the statement, and you will get the same result: one single driver is -almost always- small compared to the sum of others. [European Union]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1	14	3	This statement needs definitely further qualifications: what is the time horizon? What is the region? What is the emission scenario/temperature change? What is the assumption with respect to adaptation, mitigation? Or is this statement in general valid? If so, this should be clearly stated. A more accurate wording might be: At a global level 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 in the first half of this century. This further qualification of the statement would indicate that there are regions where climate change can be the dominant reason for changes (e.g. for inuit living in the Arctic) and that even by the end of this century under high emission scenarios such statement might also not be robust any more. [Government of Austria]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	1		3	This statement is too vague. "impacts ...are projected to be large relative to climate change". Need more clarity. [Government of Ireland]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	2	14	2	for clarity change "...large relative to..." to "...more important than..." [Jonathan Lynn, Switzerland]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	2			it is unclear whether climate change impacts are small overall. Or that other factors are "projected to be larger"? Specify the degree of climate change impacts. [Government of Netherlands]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	3	14	3	change the certainty to "confidence level" as other parts. [Hui JU, China]	We use evidence and agreement if they do not result in an unambiguous confidence level, like in this case (medium and high).
SPM	14	3	14	3	Is this true even for impacts of extreme events? A severe cyclone can destroy all human settlements, infrastructure, industries, etc permanently changing the lifestyles of the communities [Government of India]	We have modified this statement to highlight aggregate economic losses and annual losses from climate change that are projected to be negative. This provides the needed balance that more accurately reflects the SPM approved text from the underlying chapter 10 in WGII.
SPM	14	3			please use confidence levels in a more consistent way replace medium evidence, high agreement by medium confidence [Government of Netherlands]	We prefer using evidence and agreement to highlight where medium confidence may stem from. This is more precise.
SPM	14	5	14	5	This SPM should be consistent with the SPMs of the working groups. Country classification by income level was deleted from them due to parties' objection and therefore should not be referred to in this Summary. [Pedro Alfredo Borges Landáez, Venezuela]	We use the exact same wording as approved in the WGII SPM. Hence, in this case 'developing countries with low income' is justified as it is in the final SPM. Wording was carefully considered on a case-by-case basis.
SPM	14	5	14	5	We suggest replacing "increases in ill-health" with some alternate phrase that is less awkward. [Government of United States of America]	This is the exact wording from the approved WGII SPM.
SPM	14	5	14	6	You should consider to replace "developing countries with low income" to "the Least Developed Countries". Rationale: We feel it is important to find an agreeable formulation that separates the poorest countries from the other developing countries. Replacing "developing countries with low income" with "developing countries" will not be sufficient in statements such as this since they are most appropriate for the LDCs only. [Government of Norway]	We use the exact same wording as approved in the WGII SPM. Hence, in this case 'developing countries with low income' is justified as it is in the final SPM. Wording was carefully considered on a case-by-case basis.
SPM	14	5	14	6	Please substitute "especially in developing countries with low income" by "People in developing countries with low income and countries with poor health care infrastructure will be especially vulnerable". [Government of Germany]	We use the exact same wording as approved in the WGII SPM. Hence, in this case 'developing countries with low income' is justified as it is in the final SPM. Wording was carefully considered on a case-by-case basis.
SPM	14	5	14	6	IPCC is incurring in an error. The country classification on income was not accepted in the SPM Working Group III by more of dozen of countries and the plenary decided not to included in the SPM. Being this a SPM the same situation should be respected. [Government of Venezuela]	We use the exact same wording as approved in the WGII SPM. Hence, in this case 'developing countries with low income' is justified as it is in the final SPM. Wording was carefully considered on a case-by-case basis.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	5	14	9	The Synthesis report does not capture the robustness of the potential human health impacts. Suggest adding an additional bullet drawing from the chapter along the lines of "The major climate related changes to health that are expected to be greater risk of injury, disease, and death due to more intense heat waves and fires; Increased risk of under-nutrition resulting from diminished food production in poor regions; lost work capacity and reduced labor productivity in vulnerable population; increased risks of food- and water-borne diseases and vector-borne diseases." [Government of United States of America]	Unfortunately, tight word/page limits on the SOM prevent us from providing the same level of detail that we can offer in the main text of the SYR. The details suggested here are in the main text.
SPM	14	5	14	15	The analysis is accurate and relevant [JACQUES ANDRE NDIONE, SENEGAL]	Thank you.
SPM	14	5	14	19	These four paragraphs all begin in a row begin with "Climate change..."; consider a reformulation to make the reading smoother and less repetitive. [Thomas Stocker/ WGI TSU, Switzerland]	True, but most consistent with the approved texts.
SPM	14	5	14	19	All those statements need further qualifications: Time horizon? Region? Emissions scenario/temperature change? Extent of adaptation/mitigation? [Government of Austria]	The text here refers to the 21st century, unless otherwise stated, and presents the broadest synthesis that the authors can justify. More differentiation is found in the underlying SPMs and chapters.
SPM	14	5		6	RETAIN: "Climate change is expected to lead to increases in ill-health in many regions, especially in developing countries with low income (high confidence)." ADD: Emergency [Peter Carter, Canada]	Text retained. The confidence levels convey certainty, but don't prescribe emergencies.
SPM	14	7	14	7	Consider inserting "and vector migration" after "exist." Many vector-borne disease (VBD) impacts will be health impacts that currently do not "already exist," at least at a local level. [Carl Southwell, United States of America]	More details on VBDs are provided in the main text of the SYR.
SPM	14	7			What will happen after "mid century"? [Government of Germany]	The very high confidence level is only justified for studies that look at mid-century.
SPM	14	9	14	11	Can a small dedicated paragraph be added about the implications for small island states and Sub-Saharan Africa, since they are likely to be most vulnerable [Government of India]	Unfortunately, given the space constraints, no region-specific comments can be added. However, Fig SPM 7 provides a selection of global key risks, incl. Small Islands and Africa.
SPM	14	9	14	11	Please change "particularly in developing countries with low income" to 'particularly in rural and urban areas in low and middle-income countries', which will make this statement consistent with the underlying chapter. [Government of United States of America]	We use the exact same wording as approved in the WGII SPM. Hence, in this case 'developing countries with low income' is justified as it is in the final SPM. Wording was carefully considered on a case-by-case basis.
SPM	14	9	14	15	The underlying chapter discussed the importance of reliable state institutions to resolve conflict, and the role of social structure and cultural knowledge in developing effective adaptation plans which relieve some of the triggers that can lead to civil unrest. The complexity of this argument is not reflected in the summary. Please revise accordingly. [Government of United States of America]	Correct, the SPM with its strict word/page limitations cannot capture the complexities and nuances presented in the underlying chapters. The traceable accounts between the SPM and the main SYR allow the reader to consult the chapters for details.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	9		11	RETAIN: "Climate change is projected to increase displacement of people (high agreement)." ADD: Emergency. [Peter Carter, Canada]	Text retained. The confidence levels convey certainty, but don't prescribe emergencies.
SPM	14	9			Suggest replacing statements regarding evidence and agreement with the appropriate confidence statements, to be consistent with other paragraphs. [Government of Canada]	We use evidence and agreement if they do not result in an unambiguous confidence level, like in this case (medium and high).
SPM	14	10		11	exposure to extreme weather events, ~ weather events ? [Government of Hungary]	The WGII SPM states extreme weather events.
SPM	14	13	14	15	This statement singles out two types of violent conflict among many and could be interpreted as indicating that poor people are responsible, or prone, to violence. I suggest to delete "in the form of civil war and intergroup violence" and to delete also the reference to poverty as a driver. [Pedro Alfredo Borges Landáez, Venezuela]	Poverty and economic shocks are indeed among the most and best documented drivers of conflicts in the assessed literature. They are listed as two examples, also in the approved SPM of WGII. Details are found in Ch 12 of WGII. Reference to civil wars and intergroup violence is adequately supported in the underlying literature.
SPM	14	13	14	15	Please consider starting the sentence with 'In areas inconsistent state institutions, and weak social and cultural cohesion..'. The statement as written, while talks about indirect effects still overly simplifies the issue by omitting the role of robust state institutions, and well formed adapation actions. [Government of United States of America]	Unfortunately, the SPM with its strict word/page limitations cannot capture the complexities and nuances presented in the underlying chapters. The traceable accounts between the SPM and the main SYR allow the reader to consult the chapters for details.
SPM	14	13	14	15	The link between poverty and violence it is presented in a such complex relation that could be affecting the real consequences of the climate change. It is disproportionate to single out peverty among many driver of such a complex problem. It is dangerous missleading. [Government of Venezuela]	Poverty and economic shocks are indeed among the most and best documented drivers of conflicts in the assessed literature. They are listed as two examples, also in the approved SPM of WGII. Details are found in Ch 12 of WGII.
SPM	14	13		15	RETAIN: "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." ADD: Emergency. [Peter Carter, Canada]	Text retained. The confidence levels convey certainty, but don't prescribe emergencies.
SPM	14	14	14	14	Please delete the examples "such as poverty and economic shocks". These examples create the idea that the most important drivers of violence are poverty or economic issues while there are other well-document drivers as territorial or religious conflicts. [Carlos Méndez, Venezuela]	Poverty and economic shocks are indeed among the most and best documented drivers of conflicts in the assessed literature. They are listed as two examples, also in the approved SPM of WGII. Details are found in Ch 12 of WGII.
SPM	14	17	14	17	"Climate change impacts are projected to slow down economic growth" should have more prominence. [Government of United Kingdom of Great Britain & Northern Ireland]	Thank you, but we need to be as concise as possible in the SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	17	14	17	The text would more accurately reflect the underlying information if it said, "Climate change impacts are projected to shift economic growth patterns," instead of "slow down economic growth". [Government of United States of America]	This is text approved from the SPM WGII. The suggested change is too vague to be helpful for the reader. The slow down is also captured in negative impacts on annual economic losses of income (GDP).
SPM	14	17	14	18	We suggest deleting "make poverty reduction more difficult" - it is redundant [Government of United States of America]	This is text approved in the WGII SPM. Poverty reduction is important for the UNFCCC article 2 in the context of sustainable development, which is not the same as economic growth.
SPM	14	17	14	19	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.
SPM	14	17	14	19	"further erode food security" This is misleading. In all scenarios considered, food security improves relative to today. [Richard Tol, United Kingdom]	This is text approved in the WGII SPM, with careful treatment of the literature in CH13 (Livelihoods and Poverty). See also findings from Ch 6 and 7.
SPM	14	17	14	19	This paragraph contains key information to policymakers. Please consider to expand this point to reflect the relevant conclusions in WGII, for the following reasons: 1) food security is a critical issue for those concerned, and 2) climate change could have a negative impact on food security for those already at risk, 3) areas and populations that presently experience a high level of food security could be more at risk in the future. [Government of Norway]	This notion is captured earlier on in this section of the SPM (in the context of food and crops). Due to space limitations, we cannot add more text.
SPM	14	17	14	19	Could this information on climate change of economic growth be seen in connection to mitigation cost of reduced consumption loss of 0.06 percent point? [Government of Norway]	No, the underlying literature from a poverty reduction perspective uses GDP as its main parameter.
SPM	14	17		19	RETAIN: "Climate change impacts are projected to slow down 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." ADD: Emergency. [Peter Carter, Canada]	Text retained. The confidence levels convey certainty, but don't prescribe emergencies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	14	18	14	18	We suggest deleting the word "further" and just stating "erode food security." [Government of United States of America]	This is text directly from the approved WGII SPM. The point here is that climate change throughout the 21st century will continue to erode food security, hence a continuation of current/observed impacts described today (e.g. Ch 7 and 9; and Topic 1 in the SYR).
SPM	14	18	14	18	Consider inserting "(including threats to many monocultures)" after "food security." [Carl Southwell, United States of America]	Threats to monocultures are not assessed in the underlying chapters nor mentioned in the WGII SPM.
SPM	14	18	14	19	Consider changing "prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger" to "increase inequality, including prolonging existing and creating new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger." [Carl Southwell, United States of America]	Evidence and agreement on future impacts of climate change on inequality are insufficient to provide any meaningful findings. Not even Ch13 could speak to this point.
SPM	14	18	14	19	Consider adding a new item to the series of adverbial clauses, namely, "further destabilize (potable) water security." [Carl Southwell, United States of America]	The underlying chapters did not have sufficient, reliable literature to assess future risks for water security. However, a reference to water scarcity is included in the global risk table in the main text of the SYR.
SPM	14	19	14	19	Request insertion of simplified version of WGII Assessment Box SPM.2 Table.1. AR4 SYR had table on regions (AR4 SYR Table SPM.2. Examples of some projected regional impacts. {3.3.2}) and would be useful to have similar information in AR5 SYR. [Government of Japan]	Figure SPM 7 provides a selection of regional risks and for sectors.
SPM	14	19			to emphasize that countries with vulnerable economies and highly vulnerable to climate change evidence and frequency of extreme weather events related statistics offer high reliability and associated occurrence beyond the assertion of the comments consequences recognized scientific. [Government of Nicaragua]	We are not sure what this comment refers to. Line 19 stresses particular areas where new poverty traps have been discussed in the literature.
SPM	14	24	14	32	The text in Figure SPM.7 is not clearly visible. Need to improve the resolution. [Government of Switzerland]	Done
SPM	15	0	22	0	All this text transmits the idea that adaptation is limited while mitigation does not. That is a very dangerous idea because is not based in the science. Both, adaptation and mitigation have limits, in the case of mitigation these limits are determined by the risk associated to different pathways of mitigation. Please include some clarification about. [Carlos Méndez, Venezuela]	This comment is relevant to topic 3

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	1	15	1	Impact assessment on oceans is critical information for policymakers and ask for insertion of the following lines from AR5 WGII SPM P17, para2: For medium- to high-emission scenarios (RCP4.5, 6.0, and 8.5), ocean acidification poses substantial risks to marine ecosystems, especially polar ecosystems and coral reefs, associated with impacts on the physiology, behavior, and population dynamics of individual species from phytoplankton to animals (medium to high confidence). [Government of Japan]	some information on ocean acidification inserted
SPM	15	1	15	1	Please insert "likely" between "will" and " continue". [Government of United States of America]	Ongoing climate change and its impacts are virtually certain. No change
SPM	15	1	15	3	The mention of ocean acidification is not clear here. Acidification is a consequence, not a cause of climate change. Stating that "The risk of abrupt change increase with (...) direct effect of accumulating CO2 causing ocean acidification" suggests that acidification causes (or increases) a risk of abrupt (climate) change. This sentence should be rewritten for clarity. Perhaps it would be best to split the sentence and have ocean acidification in a separate sentence. The first sentence would then just read : "The risk of abrupt and irreversible change increases with larger warming and with direct effects of accumulating CO2". Then a sentence explaining that acidification can be irreversible can be added. Moreover, the paragraph starts with a sentence about what might happen "even if anthropogenic emissions of greenhouse gases cease." But then the only mention of ocean acidification in {2.6} is : "Ocean acidification will affect marine ecosystems for centuries if emissions continue (high confidence)" (page 70 line 12), so not talking about what happens with acidification if emissions cease. [Thomas Stocker/ WGI TSU, Switzerland]	text simplified
SPM	15	1	15	3	The summary sentence need modification as this document addresses the policy makers. The statement that even if GHG emissions are 'ceased' (not possible, better use 'minimized' or 'no net emissions'), climate change will continue for centuries may drive the policy makers away from GHG mitigation policies. I suggest to revise the sentence to imply that though GHG mitigation efforts will reduce the climate change in longer period, already emitted GHGs will continue to change climate, increase climatic variability and climatic risks' [Government of India]	Sentence reworded

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	1	15	3	Suggest deleting the second bolded sentence here. The following text is not about abrupt and irreversible change but about the persistence of emitted CO2 and of associated impacts. The issue of abrupt and irreversible changes is already covered in lines 27-36 on page 13, text which we have recommended be moved to this page and merged with the text on lines 12-28. The particular wording of this second sentence also does not seem very consistent with the WGI conclusions that there is low confidence and little consensus on the likelihood of abrupt events over the 21st century. [Government of Canada]	Reworded
SPM	15	1	15	3	The second sentence refers to an immediate risk that may require action, whereas the first sentence is only a scientific curiosity with no relevance at least for the next few decades that is so important for us. Also, the two sentences address two separate issues. Therefore, I suggest to skip the long-term issue, it is not something for a summary for policymakers. [Government of Hungary]	There are long term implications from our actions now. Therefore the section is retained
SPM	15	1	15	6	This paragraph should explain, in plain language that CO2 is long-lived and therefore accumulates in the atmosphere, and that atmospheric levels are only reduced slowly through natural removal mechanisms. It is important to be very clear about why elevated atmospheric CO2 levels persist even once emissions are eliminated and so why impacts will continue for centuries. [Government of Canada]	The material has been reworded to emphasise the long time scale but there is insufficient space for this level of detail in the SPM
SPM	15	1	15	6	This paragraph muddles commitments with options and should be split into two. [Government of United Kingdom of Great Britain & Northern Ireland]	to be reworded
SPM	15	1	15	10	These statements lack a qualification with respect to their certainty. It is strongly recommended to add such qualification. [Government of Austria]	Reject. The statements are largely based on the underlying WGI and II SPMs. These conclusions were assessed in the underlying WG reports to be factual statements and thus do not have uncertainty qualifiers attached in line with the AR5 Guidance Note on Uncertainty (Mastrandrea et al., 2011). The statements build on the underlying WGI and II SPMs where the individual parts have been approved without specification of uncertainties.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	1	15	25	This section mixes different issues. Sea level rise beyond 2100 should have been discussed on p.13, lines 12-18. Ocean acidification should have its own statement on page 13, line 19. This section should be limited to climate feedbacks, abrupt changes and tipping points. This would include the Amazon Forrest die-back, sea-ice melt affecting ocean currents and decreasing albedo, methane emissions from permafrost melt, and the collapse of the West-Antactica Ice Sheet. We think it would also be merited to indicatie the impacts of feedbacks on mitigation potential. this would be an opertunity for synthesis [Government of Netherlands]	to be reworded - we need to consider the structure of the SPM.
SPM	15	1	27	12	Two radically different concepts of risk are used throughout these pages without making the distinction between the two. Risk of climate change impacts, and risk of mitigation and adaptation policies. We think this is very confusing and would suggest to use some other word for the second, and we suggest "uncertainty about the effectiveness". It needs to be better dealt with than in SPM-22, lines 35-36. [Government of Netherlands]	This is Topic 3
SPM	15	1		3	missing information about a confidence level [Government of Netherlands]	Statement of fact
SPM	15	1		6	RETAIN: "Many aspects of climate change and its impacts will continue for centuries even if anthropogenic emissions of greenhouse gases cease. The risk of abrupt and irreversible change increases with larger warming and with direct effects of accumulating CO2 causing ocean acidification. The effects of CO2 emissions persist for centuries; depending on the scenario, 15-40% of emitted CO2 will remain in the atmosphere longer than 1,000 years. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO2 emissions." ADD: Emergency. [Peter Carter, Canada]	Text reworded, but "emergency" not added
SPM	15	1			Two different issues are collapsed into this section (inertia and the risk for abrupt change) for clarity is would be more useful to treat them as two separate points [Government of Sweden]	text reworded.
SPM	15	2	15	3	This conclusion has been mentioned earlier and is redundant here. [Government of Netherlands]	The conclusion does not appear earlier as a headline statement and overlap between the subsequent text and earlier material has been substantially reduced
SPM	15	2	15	3	Please clarify this phrase, because it is not clear what is meant. [Government of Germany]	Reworded
SPM	15	3	15	3	The syntax seems garbled here: "and with direct effects...causing ocean acidification." [Government of United States of America]	text reworded
SPM	15	3	15	3	It is not adequate to address ocean acidification only in the same sentence with climate change. Ocean acidification deserves a paragraph of ist own! [Government of Austria]	Agreed. Text reworded
SPM	15	3	15	4	It is importante to considere the use of Greenhouse Gases instead of CO2. [Government of Venezuela]	The simulations are strictly for CO2

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	3	15	5	good that this is made clear. No change necessary just think it is important to maintain this text as many policy makers and public do not realise the long time-scales involved [Joanna House, United Kingdom of Great Britain & Northern Ireland]	thank you. Text simplified but main message retained
SPM	15	3	15	6	Extraordinary highlight. Clear, concise and with a potent narrative/. It is certainly hope this sentence remains as it is. [Tabaré Arroyo Currás, Mexico]	thank you. Text simplified but main message retained
SPM	15	4	15	4	Please insert "likely" between "will" and "remain". [Government of United States of America]	text reworded these actual words deleted
SPM	15	4	15	4	The 15-40% includes not just scenario issues but the uncertainties in projecting the carbon cycle. [Government of United States of America]	text reworded these actual words deleted
SPM	15	5	15	5	Line of cite, {2.1} should be at the end of the paragraph. [Thomas Stocker/ WGI TSU, Switzerland]	done
SPM	15	5		6	This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO2. {2.6} This is an exceptionally crucial statement (e.g. for PM readers), however, the term "climate change commitment" is rather ambiguous [Government of Hungary]	these words deleted but the concept retained.
SPM	15	6			• SPM [P15 L1-6] Emphasis on CO2. Original text has a wider coverage of GHGs. See WG I, p. 1106. [Government of Saudi Arabia]	CO2 is the most important driver
SPM	15	8	15	8	"...shifting biomes, re-equilibrating soil carbon,..." - technical language [Jonathan Lynn, Switzerland]	Deleted re-equilibrating
SPM	15	8	15	8	"biomes" is a very technical term, please consider use other wording [Government of Denmark]	Word is correct. No change.
SPM	15	8	15	8	Suggest revising "re-equilibrating soil carbon" into plain language. [Government of Canada]	Deleted re-equilibrating
SPM	15	8	15	8	Consider inserting "and microbiomes" after "biomes." [Carl Southwell, United States of America]	Too great a level of detail.
SPM	15	8	15	19	It may be worth clarifying that the effects of some of the processes described here will be detectable through study of geological samples, deep ice cores sample (provided they will still be available!) and other methods of scientific investigation (e.g. study of fossils) as some reader may be led to think otherwise... [Government of United Kingdom of Great Britain & Northern Ireland]	Not sufficient space for this detail
SPM	15	9	15	10	Suggest avoiding using the word "detectable" in this context (a very long term projection) because it confused with the detection and attribution of historical change, which requires a specific methodology. Suggest replacing "changes detectable hundreds to thousands of years ..." with "changes that will be apparent for hundreds to thousands of years ...". [Government of Canada]	changed to lasting
SPM	15	12	15	15	This sentence is complicated and we suggest to simplify it to: "Medium to high greenhouse gas emissions pathways (consistent with RCPs 4.5, 6.0 and 8.5) pose high risk of abrupt and irreversible climate change". [Government of Netherlands]	Not changed - maintain focus on magnitude and rate of change

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	12	15	15	Please delete the word "high" before risk. It isn't logical to say we have medium confidence that something is high risk. [Government of United States of America]	No, it is possible to have high consequence outcomes in which you have low confidence
SPM	15	12	15	17	The purpose of this paragraph is not fully clear, hence we wonder if marine ecosystems should be included due to their sensitivity to warming (WGII SPM : "global marine-species redistribution and marine-biodiversity reduction in sensitive regions will challenge the sustained provision of fisheries productivity and other ecosystem services") [Government of Belgium]	marine issues now covered in a separate paragraph
SPM	15	12	15	17	The risk of climate change to terrestrial and freshwater ecosystems is mentioned. What is the risk to marine ecosystems? This should be included, particularly if the certainty is lower. [Government of United States of America]	marine issues now covered in a separate paragraph
SPM	15	12		17	RETAIN: "Within this century, magnitudes and rates of climate change associated with medium- to high-emission scenarios (RCP4.5, 6.0, and 8.5) pose high risk of abrupt and irreversible regional-scale change in the composition, structure, and function of terrestrial and freshwater ecosystems, including wetlands. Examples that could lead to substantial impact on climate are the boreal-tundra Arctic system and the Amazon forest. Ocean acidification will affect marine ecosystems for centuries if CO2 emissions continue" [ADD: or not]. ADD: The impact on climate is amplifying carbon feedback emissions. ADD: Emergency. ADD: Only RCP2.6 may not have this high risk. [Peter Carter, Canada]	Text reworded, but these particular points not added as they are too detailed
SPM	15	15	15	16	This is an example of a low confidence statement in the FOD SPM. Also, this sentence is not very well worded and we suggest to rewrite it to: "Regions that may turn to large greenhouse gas sources at a relatively small temperature increase include the Arctic tundra (medium confidence) and the Amazon forest (low confidence)." [Government of Netherlands]	examples deleted
SPM	15	15	15	16	Please clarify whether the examples lead to substantial impact on climate or are substantially affected by climate change. If they lead to climate change please explain why. [Government of Germany]	examples deleted
SPM	15	15	15	16	should this not be "feedbacks to climate" rather than impacts on climate. Just makes it clearer as the paragraphs starts talking about impacts of climate on ecosystems and now you switch to the feedbacks. Might be good also to give examples of the ecosystems most at risk of climate change as well , before following on with the ecosystems changes that pose most risk to climate [Joanna House, United Kingdom of Great Britain & Northern Ireland]	examples deleted
SPM	15	15	15	16	Needs editing. As stated, it is not an example of the point made in the previous sentence. Regardless, this document should have no examples that are characterized as "low confidence". [Government of United States of America]	Examples deleted
SPM	15	15			How? [Government of Sweden]	examples deleted

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	16	15	16	It is suggested that the phrase "Examples that could lead to substantial impact on climate are the boreal-tundra Arctic system (medium confidence) and the Amazon forest (low confidence)." is complemented with the statement "Carbon stored in the terrestrial biosphere (e.g., in peatlands, permafrost, and forests) is susceptible to loss to the atmosphere as a result of climate change, deforestation, and ecosystem degradation (high confidence)." as taken from WG2-B2. [Tabaré Arroyo Currás, Mexico]	examples deleted
SPM	15	16	15	16	Ocean acidification will affect marine: would be helpful to emphasize that OA "will CONTINUE TO effect marine ecosystems", as ecosystems are already showing OA effects. [Lena Menzel, Germany]	rejected - want to emphasise the strong future impact
SPM	15	16	15	17	We support the inclusion of the statement that Ocean acidification will affect marine ecosystems for centuries if CO2 emissions continue. [Government of New Zealand]	material added
SPM	15	16	15	17	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. Also, if rephrased in this way, then these lines would fit better with the bolded sentence on lines 1-2 and could be moved up to be part of the supporting text for that finding on persistence of impacts. [Government of Canada]	rejected - want to emphasise the strong future impact
SPM	15	16	15	17	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). This point should be added [Lena Menzel, Germany]	This is on the main text but not included here because of space limitations.
SPM	15	16	15	17	Please amplify the last sentence in order to highlight some issues regarding ocean acidification (see WG2, SPM page 17, first whole paragraph). [Government of Finland]	emphasis added
SPM	15	16	15	17	Move the sentence to line 6 page 15 [Maria Carmen Llasat, Barcelona]	sentence deleted
SPM	15	17	15	17	Emissions will not stop now, thus the "if CO2 emissions continue" should be clarified. [Government of France]	text reworded
SPM	15	19	15	19	The term "threshold" is typically used for forcing while tipping point is commonly used for the response. It is suggested that threshold is replaced by "tipping point". [Government of United States of America]	This material has been deleted here

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	19	15	21	In addition to the assessment for ice-free Arctic Ocean, a statement regarding ice sheets is to be added by drawing partially from the following description in page SYR-71 on line 16-20: Current estimates indicate that the threshold is greater than 1°C (low confidence) but less than about 4°C (medium confidence) with respect to pre-industrial temperatures. Abrupt and irreversible ice loss from a potential instability of marine-based sectors of the Antarctic ice sheet in response to climate forcing is possible, but current evidence and understanding is insufficient to make a quantitative assessment. [Government of Japan]	Now included
SPM	15	19	15	21	It could be debated whether evidence can be derived from models, and we suggest to reword this sentence to: "Global climate models show a gradual response of Arctic sea ice to warming, rather than a threshold." [Government of Netherlands]	This material has been deleted here
SPM	15	19	15	22	The reason for this "little evidence in global climate models of a threshold in the transition...." is likely that these models do not have the ability/skill to simulate/forecast these thresholds, sudden shifts and similar. Thus this sentence is potentially misleading to the reader. [Government of United States of America]	This material has been deleted here
SPM	15	19	15	23	Why is not the Antarctic mentioned at all. Is it true that the Antarctic is not mentioned in the previous reports at all? [Government of Sweden]	Antarctic sea ice is mentioned in the WGI report but not here where we have to select the most significant items
SPM	15	19	15	23	The sentences might lead to misunderstandings: it sounds as if the Arctic would be contributing to sea-level rise, although with "ice sheets" you are referring to other places than the Arctic where it is sea ice. [Government of Germany]	reworded.
SPM	15	19	15	23	The sentences might lead to misunderstandings: it sounds as if the Arctic would be contributing to sea-level rise, although with "ice sheets" you are referring to other places than the Arctic where it is sea ice. [Government of Germany]	Sea ice material deleted
SPM	15	19	15	23	Sea ice is an important habitat, especially for marine animals. This should be included here (loss of this habitat for these organisms may affect fisheries) [Lena Menzel, Germany]	Sea ice not now included in the SPM because of space limitations
SPM	15	19	15	23	The reader might not notice that this text shifts from discussing sea ice to land ice; this should be made more clear. [Government of United States of America]	reworded.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	19	15	28	This discussion of irreversibility in terms of sea ice, ice sheets and permafrost needs clarification. As written on lines 1-2 of this page, climate change will persist for centuries even if emissions of GHGs cease. If so, then can the consequences for sea ice, and ice sheets and permafrost be stated in this context, of persistent elevated temperatures? So, while sea ice extent may not be irreversible (i.e. extent would recover if cooler temperatures prevailed), can it be made clear that under conditions of persistent global warming, changes in the cryosphere are effectively irreversible? [Government of Canada]	text reworded. The sea ice sentence has been deleted
SPM	15	21	15	21	Regarding the phrase "larger sea level rise", what is this larger than? There is no point of comparison. [Government of Canada]	text reworded.
SPM	15	21	15	22	"Sustained mass loss by ice sheets would cause larger sea level rise, and some part of the mass loss might be irreversible." This is very vague. I recommend it to be replaced by, for example, reference to the 5-10 m higher sea-level in the last interglacial period when temperature was at least 2 degrees warmer. (WG1, SPM, page 11) [Kaisa Kosonen, Finland]	reworded.
SPM	15	21	15	23	Suggest a new paragraph in order to avoid possibly mixing up of which ice melt that raises sea level. [Government of Sweden]	reworded.
SPM	15	22	15	22	Some reference to the Greenland and Antearctic ice sheets should be done in relation with potential sea level rise. [Government of Switzerland]	agreed reworded

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	23			Please add the total SLR potential in the ice bound in the Greenland and Antarctic Ice Sheets: 7m for Greenland and 56m for Antarctica. Please mention that up to 15m+ of SLR potential of the Antarctic Ice Sheet is grounded on rock deep below sea level in what is termed marine based ice sheets. This is relevant as the ocean is absorbing over 90% of the incremental heat from GhG accumulation in the atmosphere. The rate of net heat uptake in the Ocean is obviously tens of times faster than in paleoclimate and there are multiple examples of multi meter sea level rise per century in paleoclimate. Eventually this ocean heat will reach Antarctica given the shape of the currents in the Southern Ocean. Antarctic Marine based ice sheets are in contact with the ocean and the documented experience of the Greenland marine ice glaciers (Jacobshafen) has shown that ice melts very rapidly when it comes in contact with warm water. The ice sheets have been stable for a long time as salt water can be liquid and below 0C. Salt water freezes at -1.8C. This is now clearly changing as the Ocean quickly warms relative to past events. Non of this is new science. The IPCC has never given policy makers this simple base data logic sequence in an SPM or SYR and most policymakers and the media do not know it. Given the recent research on Antarctica the IPCC should at least equip them with the basic quantity facts even if the IPCC make no change to the statement about future melting. If policymakers have the basic facts they can make a value judgement or ask hard questions. Or do we have to wait another 6 years until AR6? [Michael Casey, Ireland]	Some more specific values given, but not the total possible rise
SPM	15	25	15	25	What do we mean when we say "effectively irreversible"? Could we say, " A reduction in permafrost extent is virtually certain".[Government of United States of America]	reworded.
SPM	15	25	15	28	This is a climate feedback issue; should be discussed seriously with other climate feedback points (such as how changes in rainfall patterns could influence the hydropower capacity in certain regions/countries) [Government of Netherlands]	not sufficient space in the SPM
SPM	15	25	15	28	Do you have underlying findings from WGI that could provide more information on how the melting permafrost will affect the temperature increase? Is this taken into account in the different RCPs? [Government of Norway]	deleted release of carbon because of overlap with earlier material
SPM	15	25	15	28	Is there a risk of runaway climate change due to methane release with permafrost thaw? If so, state. [Government of South Africa]	deleted release of carbon because of overlap with earlier material

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	25	15	28	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. Suggest clarifying. Also, the text should make reference to emissions as CO ₂ and CH ₄ . It is important to state both CO ₂ and CH ₄ 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 CO ₂ , under most conditions. [Government of Canada]	deleted release of carbon because of overlap with earlier material
SPM	15	25	15	28	This section could also discuss methane release from gas hydrates and wetlands. [European Union]	insufficient space here
SPM	15	25		28	RETAIN: "An effectively irreversible reduction in permafrost extent is virtually certain with continued rising global temperatures. Carbon accumulated over hundreds to thousands of years in frozen soils could be emitted through decomposition within decades as a result of permafrost thaw. Current permafrost areas are projected to become net emitters of carbon during the 21st century under future warming scenarios." ADD: Emergency. [Peter Carter, Canada]	deleted release of carbon because of overlap with earlier material
SPM	15	26	15	27	This statement is weak ("could") and provides little information in addition to the following sentence, and we therefore suggest to delete it. [Government of Netherlands]	deleted release of carbon because of overlap with earlier material
SPM	15	26	15	28	What are the confidence levels associated with these statements? [Government of Canada]	Confidence now included
SPM	15	27	15	27	"thaw, a positive feedback on climate change." Please explain why this is important. [Government of United States of America]	deleted release of carbon because of overlap with earlier material
SPM	15	27	15	28	Please provide the appropriate confidence statement and specify which of the scenarios, if appropriate. [Government of Sweden]	confidence now included
SPM	15	27	15	28	The word "projected" implies the use of models, and we therefore suggest to delete: "under future warming scenarios". [Government of Netherlands]	reworded
SPM	15	27	15	28	add "add methane" after carbon ? [Jonathan Lynn, Switzerland]	deleted release of carbon because of overlap with earlier material
SPM	15	27	15	28	Should one specifically mention methane in the context of permafrost thawing? [Government of Finland]	deleted release of carbon because of overlap with earlier material
SPM	15	27			Cf. Lines 6 and 7 on page 13. Enoughwrite about permafrost at one place in the SPM. [Government of Sweden]	reworded
SPM	15	28	15	28	"... Net emitters of carbon..." . And also of CH ₄ ? (a more potent GHG) [Tony Weir, Australia]	deleted release of carbon because of overlap with earlier material
SPM	15	28	15	28	Please mention the resulting impacts for atmospheric CO ₂ of permafrost thaw and other carbon cycle feedbacks to the atmosphere. [Government of France]	deleted release of carbon because of overlap with earlier material

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	31	15	31	Should this section be called "responses" rather than "Transformations and changes in Systems." [Government of United States of America]	The section headlines are given and approved by the IPCC Bureau
SPM	15	31	15	31	The title that really describe the content is "Adaptation and Mitigation pathways". Please remember that in the discussions of the definition of transformation in last meeting in Yokohama of G-II there were many arguments that shows this term it is still a complex one and needs more reflexion. [Government of Venezuela]	The section headlines are given and approved by the IPCC Bureau. Also the structure and text in topic 3 has been changed to better follow the given topic headline.
SPM	15	31	18	7	Are the numbers here consistent with the right hand panel of Figure spm5? This is not at all clear to me and should to the extent possible be clarified. In particular its not entirely clear that the likelihoods are consistent with those made in Figure spm5 and the text associated therewith. This could be a major issue if these are in disagreement? [Peter Thorne, Norway]	Noted. The numbers have been checked and are consistent.
SPM	15	31	20		risks of delayed action are underestimated in text; more emphasis needed on what it implies, what the costs are in the short term (not just the long term discounted costs); issue of excluding certain technologies (nuclear, CCS, BECCS) need to be discussed more clearly [Government of Netherlands]	The risk of delayed action has been lifted in the text and in both 3.1 Foundations of decision making for climate change and in particular in section 3.4 Characteristics and risks of mitigation pathways
SPM	15	31	20		Please include Table 3.1. in Section 3.1. of the SPM, adding the information on sea level rise from WG1. This would increase the usability of the SPM. [Government of Germany]	The table is included but not with the sea level information
SPM	15	31			Section 3 : Why this section does not refer at all to the SYR 3.1 section ? Part of the report is then missing in the summary [Thomas Stocker/ WGI TSU, Switzerland]	The text has been modified and restructured so now Topic 3 starts off with a section on foundations of decision making for climate change that does refer to 3.1 in the report
SPM	15	33			The presentation of the WGIII MAGICC-based temperature projections vis-à-vis the WGI CMIP5 temperature projections needs to be revisited. Currently, the CMIP5 RCP based projections are not even included in Section 2 of the SYR SPM. In contrast, the MAGICC-based temperature projections are given for a number of scenario categories. This omission of the CMIP5 RCP projections as reported in the WGI AR5 SPM is very odd given that the scientific assessment of physical climate projections and related uncertainties in the IPCC AR5 are presented in the WGI report. [Thomas Stocker/ WGI TSU, Switzerland]	This has been improved in the Final Draft. The assessment of CMIP5 projected temperature change for the RCPs by 2016-2035 and by 2081-2100 from WGI is now explicitly mentioned in the SYR SPM. We note that consistency between the WGI and WGIII temperature projections has been ensured in the SYR.
SPM	15	35	15	35	Please replace "will continue..." with "will likely continue..." [Government of United States of America]	Text has been changed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	35	15	37	It does not make sense to refer to a median increase and then give a range. Readers will also likely not understand what is meant by a median increase. The likely range of warming under RCP 8.5 given in WGI Table SPM.2 is 3.2 - 5.4 C relative to 1850-1900. This is based on the CMIP5 simulations. Suggest replacing with 'a likely increase in global mean surface temperature of about three to five degrees C relative to 1850-1900 by 2100.' Also, suggest that this statement needs a confidence assessment. [Government of Canada]	The headline statement has been modified.
SPM	15	35	15	37	Since there are uncertainty it is relevant to add "probably" before "will" in this sentence to indicate the uncertainty. [Mingshan SU, China]	The headline statement has been modified.
SPM	15	35	15	40	Shorten and simplify. Break up long sentences e.g. after possible. Yet=This will? [Government of Ireland]	The headline statement has been modified.
SPM	15	35	15	40	Suggest inserting an example to give further detail about what "challenges" referred to. For this purpose, we recommend inserting "including widespread deployment of Carbon Dioxide removal(CDR) technologies" after "behavioural challenges" in line 39 [Government of Japan]	The headline statement has been modified.
SPM	15	35	15	40	We suggest the headline statement to be explicit about mitigation for 2°C as follows: "In order to limit global warming to <i>likely</i> maximally 2°C, nett greenhouse gas emissions need to approach zero between 2050 and 2070, or be compensated by nett removal later. Such cuts entail a global transition of the energy system, including technological, economic, institutional and behavioural change. Without additional mitigation, warming will be in the range of 3½-5°C around 2100." [Government of Netherlands]	The headline statement has been modified.
SPM	15	35	15	40	Add line of cite to box: {3.2} [Thomas Stocker/ WGI TSU, Switzerland]	Done
SPM	15	35	15	40	The statement about "...cause a median increase in global ..." should include the words "according to current models". The word "model" is mentioned nowhere in that part of the text now. [Government of Norway]	The headline statement has been modified.
SPM	15	35	15	40	The statements on temperature increase should be consistent with previous statements (median increase is not commonly used in AR5) and contain uncertainty statements together with the ranges given. The current information is quite confusing. [Government of Germany]	The headline statement has been modified.
SPM	15	35	20	12	Section 3.1: There is a greater level of detail in this section than any other part of the SPM, and it detracts from the ability to make important, clear statements about mitigation pathways. Suggest reviewing for ways to simplify text, figures and table so that they work to deliver a clear message. [Government of Canada]	The text has been modified and restructured to this end.
SPM	15	35		39	RETAIN: "In the absence of additional mitigation efforts, GHG emissions will continue to grow, and cause a median increase in global mean surface temperature of more than three to almost five degrees Celsius relative to pre-industrial levels by 2100. [ADD: Rapid] deep cuts in GHG emissions [ADD: starting at the latest from 2020] to limit warming to 2°C relative to pre-industrial levels remain possible." ADD: Emergency [Peter Carter, Canada]	Text has been modified.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	35			This is where the RCP discussion would be better placed [Government of Sweden]	The RCPs are referred to in the Table SPM.1 and in Figure SPM.11 as it would be too detailed to bring them into the main text and especially in the headline statement.
SPM	15	36	15	36	It says here "more than three to almost five". It would be better to be specific and say 3.8 to 4.7 [Government of Sweden]	Text has been modified.
SPM	15	36	15	36	What is meant by "median increase in global mean ...". Too many words in this sentence, please consider to make it shorter and more precise. [Government of Norway]	Text has been modified.
SPM	15	36	15	36	The language here is confusing. The authors should just use the numbers. The approximations are misleading. [Government of United States of America]	Text has been modified.
SPM	15	36	15	36	A median change in the mean is incredibly confusing terminology and should be significantly clarified. Easiest would be to remove 'median' here as no context is lost. [Peter Thorne, Norway]	Text has been modified.
SPM	15	36	15	37	"more than three to almost five degrees" should be replaced with "3.7C to 4.8C", for the purpose of precise description. [Government of Japan]	Text has been modified.
SPM	15	37	15	37	Please, replace the two sentences, the first one starting "Deep cuts.." with a sentence starting on page 16 line 17 "Delaying mitigation efforts...". In our estimation this sentence is much clearer for the policy maker. [Government of Finland]	Text has been modified.
SPM	15	37	15	38	The RCP2.6 scenarios take to about 1.6°C warming by 2100. So the formulation here "Deep cuts in GHG emissions to limit warming to 2°C relative to pre-industrial levels" should be changed to either "to limit warming to about 1.5°C" or to "to limit warming to less than 2°C". [Kaisa Kosonen, Finland]	Text has been modified.
SPM	15	37	15	38	"remain possible, yet" should be deleted. Even though there is possibility to achieve 2 degree scenario on the basis of model calculation, whether it is realistically possible or not is controversial. Neutral expression would be appreciated. [Kei ESASHI, Japan]	Text has been modified.
SPM	15	37	15	39	Language is strange: Deep cuts should always remain possible. Change wording: "Limit warming to 2°C relative to pre-industrial levels remains possible via deep cuts in GHG emissions which will entail substantial ..." [Jochen Harnisch, Germany]	Text has been modified.
SPM	15	37	15	39	The report states that 2 °C is "still possible". Is 1.5 °C still possible? [Government of South Africa]	Text has been modified.
SPM	15	37	15	40	Suggest avoiding adjectives such as "ambitious" or aggressive when describing mitigation scenarios since these modifiers imply value judgments. The statement would be as effective if "less ambitious" were replaced with "lower levels of". [Government of Canada]	These adjectives are not used in connection with value judgments in the modified text. There is one sentence saying "Such carbon dioxide removal (CDR) technologies play a major role in many ambitious mitigation scenarios." But there is no value judgment in this formulation.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	38	15	39	substantial technological, economic, institutional, and behavioural. It has been discussed in WGII that there must not be any reference to the types of challenges. [Government of Bolivia]	Text has been modified.
SPM	15	39	15	40	This is a very important point: that aiming for higher concentration or temperature targets don't really buy that much time (as long as you want to stay below 6-700 ppm). But it is not substantiated in the paragraphs that follow. Also this sentence is quite vague. Can it be made more specific and sharp? WGIII SPM Figure 4 has some examples. [Government of Sweden]	Text has been modified.
SPM	15	39	15	40	"Similar challenges would have to be faced for less ambitious mitigation, but over a longer period of time." I believe this is not representative of the underlying science. Challenges would for sure be much bigger, not similar, if mitigation action was NOT taken. [Kaisa Kosonen, Finland]	Text has been modified.
SPM	15	39	15	40	The sentence is not clear. Rephrasing it, following the formulation of the sentence on page 16, lines 13-14, might be more clear: "Scenarios reaching less ambitious mitigation targets imply similar challenges, but on a slower timescale." [Government of France]	Text has been modified.
SPM	15	40	15	40	Please revise the text to read: "mitigation TARGETS, but.." [Government of United States of America]	Text has been modified.
SPM	15	42	15	42	"Additional mitigation" ..additional to what? [Government of India]	Text has been modified.
SPM	15	42	15	43	It is unnecessary to define what is meant by "baseline scenario" twice in the same paragraph. [Government of United States of America]	Text has been modified.
SPM	15	42	15	44	We think the bolded sentence is too complicated and too repetitive of what follows, and we suggest to rephrase to: "Without additional mitigation (consistent with RCP8.5), global mean surface temperature in 2100 will be from 3.7 to 4.8°C higher than pre-industrial." [Government of Netherlands]	Thank you, the text has been modified.
SPM	15	42	15	44	Is the baseline scenario different from RCP 8.5? Could you please use RCP 8.5 as it brings confusion to use two different sets of scenarios. [Government of Norway]	It has been made clear in the text that baseline scenarios are those without additional mitigation.
SPM	15	42	15	44	It seems that there could be better integration of the information such as this coming out of WGIII and the information presented earlier from WGI on temperature rise. I suggest this text could be included in the earlier section 2 of the SPM. Or otherwise somehow make the distinction that the earlier data has been run through a full GCM while this data is from an ensemble of IAM results coupled to a simple climate model. Although this may be too technical for an SPM. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The text has been modified to meet this call for closer integration of information about temperature rise and mitigation.
SPM	15	42	15	44	In that sentence, it should be precised: (i) to what is mitigation "additional", (ii) what is meant exactly by pre-industrial levels [Government of France]	Text has been modified and the sentences are more precise.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	42	15	47	Shouldn't we also make mention of longer-term T implications of the described pathways? Such a description leaves an impression that these numbers are the end of warming; whereas they are simply the end of the century, with temperature changes most probably on a very steep rise (for rcp 8.5). This needs to be acknowledged. [Diana Urge-Vorsatz, Hungary]	Done
SPM	15	42	16	2	The information from WGI (Table SPM.2) and WGIII (Table SPM.1) should be presented in an integrated and transparent way, possibly in a table. Otherwise, confusion might arise. Currently, on P 11 L 33-37, you refer to WG1, Table SPM.2. However, here you refer to WG3 Table SPM.1. Both tables have different reference periods and also different end years for projections (2081-2100 vs. 2100). [Government of Germany]	This has been improved in the Final Draft, though no combined table has been included in the SYR SPM. However, consistency between the WGI and WGIII temperature projections has been ensured in the SYR. The assessment of CMIP5 projected temperature change for the RCPs by 2016-2035 and by 2081-2100 from WGI is now explicitly mentioned in the SYR SPM.
SPM	15	42		44	Re this sentence: [ADD: Models for] "[b]aseline scenarios, those without additional mitigation, [DELETE: result in] [ADD: project] global mean surface temperature increases in 2100 from 3.7 to 4.8°C compared to pre-industrial levels [...] the range is [...] up to 7.8°C when including climate uncertainty." NOTE: Uncertainty here includes certain amplifying carbon feedback warming, so should not be called "uncertainty," which is policy-misleading. Based on the science and for risk, this must include a projection based on the upper climate sensitivity of 4.5°C. ADD: Emergency. [Peter Carter, Canada]	Not covered by topics
SPM	15	42		47	The wording in this para is unclear. Should be 'Baseline scenarios, which do not take additional mitigation into account, show that global mean surface temperature... These scenarios show atmospheric CO2 exceeding 450...' [Government of United Kingdom of Great Britain & Northern Ireland]	The text has been modified to make it more clear.
SPM	15	42			Should this not be "explicit" instead of "additional"? [Joanna House, United Kingdom of Great Britain & Northern Ireland]	No we are talking about additional measures.
SPM	15	43	15	43	in discussing climate projections, "mean" was used in the WGI report SPM and "median" is used here. There should be a clear definition of what these are a "mean" or "median" of. [Haroon Kheshgi, United States of America]	Do not include mean or median in the modified text.
SPM	15	43	15	44	The numbers given here come from SYR page 74, lines 35-36 and they are given without confidence statement there. The (high confidence) should be made consistent between SPM and SYR main text, in accordance with the underlying WGIII SPM and Chapter [Thomas Stocker/ WGI TSU, Switzerland]	Sentence has been deleted
SPM	15	43	15	44	What point is there in citing temperature ranges that do not include climate uncertainty? If there is a valid reason, be explicit otherwise the reader is left wondering why there are two ranges provided [Government of United States of America]	Noted. The information is critical to better understand the different types of uncertainties associated with climate change projections, e.g., scenario uncertainty vs climate uncertainty.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	43	15	44	Following on from point on p.15 ln. 36 the use of 'median values' is confusing here but its doubly so when conflated with climate uncertainty which has not been defined either in the SPM or to my knowledge in the underlying WG1 report where such a term would logically be defined. I think here the authors mean the uncertainty in the TCR - an uncertainty which is discussed at some length in the WG1 contribution. Use of the ambiguous term 'climate uncertainty' should be avoided here and replaced with more scientifically appropriate language that reflects the WG1 discussion of the issues surrounding this. [Peter Thorne, Norway]	Noted. Climate uncertainty here refers to the uncertainties from both the carbon cycle and the climate system. We clarify that we refer to median climate response and the 5th to 95th percentile of climate model calculations when climate uncertainty is included.
SPM	15	44	15	44	The temperature levels should be consistent with those in SPM WGI. The meaning of "including uncertainty" should be made clear. Is that 5 - 95%, 10- 90% or all (0 - 100%) uncertainty? WGI concludes lower maximum temperatures (about 5.4 degrees) including 5 - 95% uncertainty range. In line with this it would be proper to apply a similar definition of "including uncertainty". But then the upper temperature level (7,8 degrees) is not consistent with WGI. [Government of Netherlands]	Noted. Consistency between the WGI and WGIII temperature projections has been ensured. However, the way uncertainty is being quantified for WGI and WGIII projections is as defined in the underlying WG reports.
SPM	15	44	15	44	How does the 7.8 degree estimate fit in with the conclusions from WGI? This is also visualized in Figure SPM.9 Panel A) and B). [Government of Norway]	Noted. The 7.8 degree upper bound of the WGIII projected temperature range mentioned here accounts for the carbon cycle and climate system uncertainties as described in the underlying WGIII report (e.g., Table SPM.1). We note that consistency between the WGI and WGIII temperature projections has been ensured in the SYR.
SPM	15	44	15	44	While it is important to also give the uncertainty range around estimates of global mean temperature change, we suggest this warrants a stand-alone sentence that describes better what this range represents. The phrase 'climate uncertainty' is not sufficient. Better would be 'uncertainty in the climate response to changes in emissions'. [Government of Canada]	Noted. Specifics about the uncertainty accounted for in the WGIII projected temperature range are given in SYR Sections 3.2 and 3.4, which is referred to here. It includes both carbon cycle and climate system uncertainties as further described in the underlying WGIII report (e.g., Table SPM.1). We note that consistency between the WGI and WGIII temperature projections has been ensured in the SYR. For baseline projections we clarified that we refer to 5th to 95th percentile range when climate uncertainty is included.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	44	15	44	The term 'climate uncertainty' is very vague and confusing for most readers. Better to say, "allowing for a range of climate sensitivity", preferably with a footnote to explain this technical term. Or even better, replace the words "when including climate uncertainty" by a footnote to the effect "allowing for uncertainties in the increase in mean temperature associated with a particular increase in GHG concentrations". [Tony Weir, Australia]	Noted. Specifics about the uncertainty accounted for in the WGIII projected temperature range are given in SYR Section 3.2, which is referred here. It includes both carbon cycle and climate system uncertainties as further described in the underlying WGIII report (e.g., Table SPM.1). We note that consistency between the WGI and WGIII temperature projections has been ensured in the SYR.
SPM	15	44	15	44	for the range "when including climate uncertainty" it is unclear what is the probability of this range -- e.g. is this the "likely" range or some other range? [Haroon Kheshgi, United States of America]	Noted. Climate uncertainty in WG3 reflects the 5th to 95th percentile of model calculations. Ranges provided in the WGI assessments of RCP CMIP5 projections are 5-95% ranges assessed to be likely ranges. We note that consistency between the WGI and WGIII temperature projections has been ensured in the SYR.
SPM	15	44	15	44	The 2.5C to 7.8C is very specific, unless it is formal uncertainty range -the authors should drop it or give the likelihood range ('very likely'??) [Government of United States of America]	Noted. Climate uncertainty in WG3 reflects the 5th to 95th percentile of model calculations. Ranges provided in the WGI assessments of RCP CMIP5 projections are 5-95% ranges assessed to be likely ranges. We note that consistency between the WGI and WGIII temperature projections has been ensured in the SYR.
SPM	15	44	15	44	What is "climate uncertainty"? If it is uncertainty related to climate sensitivity it should be clearly stated. Then a proper wording might be: the range is 2.5oC to 7.8oC when including the uncertainty relating to climate sensitivity). [Government of Austria]	Noted. Climate uncertainty here refers to the uncertainties from both the carbon cycle and the climate system.
SPM	15	44	15	45	The meaning of "baseline scenarios" has already been defined. No need to repeat here. [Government of United States of America]	text has been modified.
SPM	15	45	15	45	This is the first time CO2-eq is used in the text. The authors should include a footnote defining CO2-eq and also including what current atmospheric concentrations of "CO2-eq" are. If there is a difference between values in WG1 and WG3, this should be explained. [Government of United States of America]	Thanks, a reference has been inserted to a topic 2 footnote.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	46	15	46	These numbers for CO2-eq seem a bit high - RCP6.0 has CO2 of 670ppm at 2100, turning that to 750 ppm-eq with CH4 and N2O is possible but seems high. RCP8.5 has 936 ppm, and making that into 1300 seems like a far reach. Some explanation or reconciliation between the WG1 and WG3 concentrations is needed here - if even in a footnote. [Government of United States of America]	Reject. The numbers given are correct. The WG1 SPM Box on the RCPs does give the same numbers for RCP8.5 (CO2 only 936ppm, CO2-equivalent 1313ppm).
SPM	15	49	15	49	This sentence could be made more comprehensible as multiple shorter, simpler sentences. For example, "There are multiple scenarios that are consistent with different levels of mitigation. These scenarios entail a range of technological and behavioral options with different characteristics and implications for sustainable development." [Government of United States of America]	This part has been rewritten and is now easier to read.
SPM	15	49	15	51	As written, the text is not clear. Please revise to improve clarity. [Government of United States of America]	This part has been rewritten and is now easier to read.
SPM	15	49	15	51	The formulation is complex, but once one understands it, it does not say much. Consider using simpler, more explicit formulations [Helmut Haberl, Austria]	This part has been rewritten and is now easier to read.
SPM	15	49	15	57	It would be interesting to call for more scientific studies with scenarios [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	Agreed and included where possible

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	49	16	27	<p>None of the bolded sentences are informative to the policy maker, but potentially very relevant. Much of the explanatory text following is too technical. We suggest to following text to replace this section:</p> <p>Climate change can likely be limited to 2°C when atmospheric greenhouse gas concentrations remain below 450 parts per million (ppm) CO2-equivalent (consistent with RCP2.6), which entails rapid large-scale implementation of proven mitigation technologies high confidence. Increasingly effective mitigation policies are represented by RCP6.0, RCP4.5 and RCP2.6 (see Table SPM.x). Scenarios consistent with RCP4.5 or 650 ppm are unlikely to keep climate change within 2°C. Scenarios consistent with 430 ppm CO2-eq are more likely that not to keep temperature rise within 1½°C (limited evidence). {3.2, Table 3.1} [Insert Table 3.1.]</p> <p>Initially less vigorous and postponed mitigation increases total mitigation costs, and make it less likely that climate change will be limited to 2°C. Delayed action would imply the use of unproven and additional large-scale carbon dioxide removal from the atmosphere (CDR), including bio-energy with carbon capture and storage (BECCS), biochar, direct air capture, ocean fertilization and enhanced weathering. All of these technologies are still in development, public acceptance is low and their use makes total mitigation costs much higher. The practical feasibility of the necessary large-scale application of these options is questionable. {3.2}</p> <p>Existing and proposed national policies, international pledges and commitments are insufficient to be consistent with pathways that limit global temperature increase to 2°C. To limit global temperature rise to 2°C, global greenhouse gas emissions need to approach zero during the second half of this century or, in case of late action, carbon dioxide needs to be removed from the atmosphere. This implies rigorous emission cuts in all regions, sectors, gases and groups of countries. Pledges made by countries at the Conference of the Parties of the UNFCCC in Cancun for 2020 are inconsistent with optimal emission reduction pathways.</p> <p>[Government of Netherlands]</p>	Thank you for the suggested changes. The text has been modified to be more informative to policy makers.
SPM	15	50			<p>Replace "consistent with" by "achieve". We have received a lot of criticism on the WGIII SPM that it is extremely difficult to understand, esp. the complex discussions on the scenarios. For a layperson, it is hard to understand what "consistent with" means in this context. [Diana Urge-Vorsatz, Hungary]</p>	The text has been modified, not relevant.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	51	16	2	<p>As projections of future concentrations and temperatures are important information for the policymaker, request that the wording in the last paragraph of WGII SPM p11 be accurately reflected here:</p> <p>Mitigation scenarios in which it is likely that the temperature change caused by anthropogenic GHG emissions can be kept to less than 2°C relative to pre-industrial levels are characterized by atmospheric concentrations in 2100 of about 450 ppm CO2eq (high confidence). Mitigation scenarios reaching concentration levels of about 500 ppm CO2eq by 2100 are more likely than not to limit temperature change to less than 2°C relative to pre-industrial levels, unless they temporarily 'overshoot' concentration levels of roughly 530 ppm CO2eq before 2100, in which case they are about as likely as not to achieve that goal. Scenarios that reach 530 to 650 ppm CO2eq concentrations by 2100 are more unlikely than likely to keep temperature change below 2°C relative to pre-industrial levels.</p> <p>Scenarios that reach about 650 ppm CO2eq by 2100 are unlikely to limit temperature change to below 2°C relative to pre-industrial levels. Mitigation scenarios in which temperature increase is more likely than not to be less than 1.5°C relative to pre-industrial levels by 2100 are characterized by concentrations in 2100 of below 430 ppm CO2eq. Temperature peaks during the century and then declines in these scenarios. Probability statements regarding other levels of temperature change can be made with reference to Table SPM.1. [6.3, Box TS.6]</p> <p>[Government of Japan]</p>	Thank you, the text has been modified.
-----	----	----	----	---	--	--

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	51	18	7	<p>Propose re-wording and simplifying this text. Suggest: Mitigation scenarios span atmospheric concentration levels in 2100 from 430 ppm CO₂eq to above 720 ppm CO₂eq, which is comparable to the 2100 forcing levels between RCP 2.6 and RCP 6.0. Scenarios that reach about 650 ppm CO₂eq by 2100 are unlikely to limit temperature change to below 2°C relative to pre-industrial levels. Only a limited number of studies have explored scenarios that are more likely than not to bring temperature change back to below 1.5 °C by 2100 relative to pre-industrial levels; these scenarios bring atmospheric concentrations to below 430 ppm CO₂eq by 2100. {3.2}</p> <p>To put recent trends in context, recent emissions growth (over the period 2000-2010) is similar to that assumed in scenario RCP [authors to complete - based on data plotted in FigureSPM.5] which is likely to give rise to a warming of [authors to complete] by 2100 and associated impacts described in section 2.</p> <p>How do we keep warming to less than 2°C relative to pre-industrial levels? Scenarios in which it is likely (66-100%) that warming can be kept to less than 2°C have CO₂eq concentrations in 2100 of about 450 ppm (high confidence). This requires 40% to 70% reductions in GHG emissions by 2050 relative to 2010. Depending on the scale of demand reductions achieved [authors need to advise on exact wording but we think it important that demand reduction be mentioned here], this will require a tripling to nearly a quadrupling of the share of zero- and low-carbon energy supply from renewables, nuclear energy, fossil energy with carbon dioxide capture and storage (CCS), or bioenergy with CCS (BECCS) by the year 2050, so that emissions fall from levels of xx GtCO₂eq in 2010 to yy GtCO₂eq in 2030 and zz GtCO₂eq in 2050 without relying on CDR technologies. [authors please insert allowable emissions for these scenarios] Large-scale changes in land use may also be required, depending on the availability of BECCS, whose scale and availability are uncertain.</p> <p>What will this cost? These scenarios (those that reach about 450ppm CO₂eq in 2100) entail losses in global consumption—not including benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation³—of 1% to 4% (median: 1.7%) in 2030, 2% to 6% (median: 3.4%) in 2050, and 3% to 11% (median: 4.8%) in 2100 relative to consumption in baseline scenarios that grows anywhere from 300% to more than 900% over the century. The numbers correspond to an annualised reduction of consumption growth by 0.04 to 0.14 (median: 0.06) percentage points over the century relative to annualised consumption growth in the baseline that is between 1.6 and 3%</p>	Thank you, the text has been modified to provide the story line you are indicating in your comment.
SPM	15	53	15	53	"likely" should be written in italic. [Government of Japan]	Reworded, not relevant.
SPM	15	53	15	53	Likely should be written in italic [Thomas Stocker/ WGI TSU, Switzerland]	Reworded, not relevant.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	53	15	55	If holding atmospheric GHG concentration to 450 ppm will likely keep global temperature below 2degC, while holding it to 650 ppm will unlikely do so, then can anything be said about concentrations between 450 ppm and 650 ppm? This is a big difference - 200 ppm. Can a confidence statement be added to the 'unlikely' sentence? [Government of Canada]	The following sentence has been added with reference to temperature (not concentrations): "Limiting teperature change to higher levels include similar changes, but less quickly". This thus refer to that 200 ppm difference.
SPM	15	53			"Likely" should be italicised - since it is being used here in the formal IPCC uncertainty language sense. [David Wratt, New Zealand]	Not included in the modified text.
SPM	15	54	15	54	This paragraph could be made more comprehensible by using shorter sentences and putting the quantities in different sentences from the summaries of their implications. [Government of United States of America]	Text has been modified.
SPM	15	55	15	55	Here should be added words on 2°C likelihood under 500ppm scenario by quoting text from SYR P76, L3-5: "Mitigation scenarios reaching concentration levels of about 500 ppm CO2eq by 2100 are more likely than not to limit temperature change to less than 2°C, unless they temporarily 'overshoot' concentration levels of roughly 530 ppm CO2eq before 2100. In this case, they are about as likely as not to achieve that goal". [Government of China]	Thank you, text has been modified.
SPM	15	55	15	55	The text should explain that we are at about 430 ppm-eq as of now (meaning 2011). There should be a clear explanation about ppm in CO2-eq perhaps as a footnote. There you can also discuss CO2-eq for emissions. [Government of United States of America]	Taken into account. A new footnote #5 has been added explaining CO2-eq and giving the 2011 value.
SPM	15	55			Change "about 650 ppm" to "above 650 ppm". Scenarios that are "unlikely" to limit temperature change to below 2 degree Celsius is "above 650 ppm" (See WGIII, Table SPM.1). [Government of Republic of Korea]	Not relevant, text has been modified.
SPM	15	55			• SPM [P15 L55] add 'Mitigation scenarios reaching concentration levels of about 500 ppm CO2eq by 2100 are more likely than not to limit temperature change to less than 2°C relative to pre-industrial levels, unless they temporarily 'overshoot' concentration levels of roughly 530 ppm CO2eq before 2100, in which case they are about as likely as not to achieve that goal (from WGIII SPM page 11, last para) [Government of Saudi Arabia]	Thank you, text has been modified.
SPM	15	56	15	56	"unlikely" should be written in italic. [Government of Japan]	Not relevant, text has been modified.
SPM	15	56	15	56	Unlikely should be written in italic [Thomas Stocker/ WGI TSU, Switzerland]	Not relevant, text has been modified.
SPM	15	56	15	56	It would be very userfriendly to include a statement that clarifies the likely temperature change by 2100 if the concentration level reaches about 650 ppm CO2eq by 2100 in order to allow for a proper comparison with the 430 ppm CO2 eq level. [Government of Austria]	Whole paragraph revised

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15	56	16	1	This sentence about 1.5 °C seems an awkward formulation. On the one hand calibrated likelihood language is used (which implies sufficient evidence and agreement to support high or very high confidence), while on the other hand, the sentence says that there have only been a limited number of studies. Suggest reformulating this to avoid the use of calibrated language. For example, the sentence could be rewritten as "Only a limited number of studies have considered scenarios under which there is a greater than 50% probability of bringing temperature change back to below 1.5 °C by 2100 relative to pre-industrial levels..." [Government of Canada]	This sentence should be clearer now as it reads: "Limiting temperature change to lower levels such as 1.5 C equires these changes on a faster timescale."
SPM	15	56	16	2	The phrasing "to bring temperature change back to below 1.5°C" seems to imply we are currently already above that threshold... [Government of France]	The sentence has been reworded.
SPM	15	56			"Unlikely" should be italicised - since it is being used here in the formal IPCC uncertainty language sense. [David Wratt, New Zealand]	Text have changed.
SPM	15	57	15	57	Is there a reason to refer to "more likely than not" level scenarios, rather than "likely" ones? Table 2.2. would seem to suggest that there are some of the latter kind of results. [Government of Sweden]	Text have changed.
SPM	15	57	15	57	Check throughout the document consistent use of italics to emphasize likelihoods. In this conclusion it is not applied consistently. [Government of Netherlands]	Done
SPM	15	57			Delete "more likely than not". Scenarios that are "more likey than not" bring concentrations to 500ppm, not to <430 (See WGIII, Table SPM.1). [Government of Republic of Korea]	Text have been modified.
SPM	15				Section 3.1 ('Human responses: an integrated approach') is not covered in the SPM. The summary thus makes no mention of (the need for) and integrated approach to climate change (section 3.1 and 3.5) nor of the justice dimension of climate change (discussed on p73 line 34-44). We suggest an introduction sentences to SPM 3 to adress these issues, for example: "effective response to climate riks entails an integrated approach that recognizes the importance of both mitigation of the rate and magnitude of climate change(3.1)" and adaptation to the effects of climate change (3.2)(Page 74 line 18-19). [Government of Netherlands]	Topic 3 show what an integrated approach would look like from page 15- 23. And with the restructuring and rewording this point is made even clearer in the second order draft of the SPM. So inseed of using limited space on arguing for an integrated approach we use the adaptation/mitigation nexus to show what an integrated response involves.
SPM	15				ADD to SPM: Also contributing to today's committed warming – much higher than 0.8°C and essential for policy – are the warming incurred from the time of policy to atmospheric stabilization; warming deferred by unmasking the cooling of air pollution acid aerosols; delayed warming of the ocean heat lag; and extra warming from amplifying feedbacks. These are all minimized by RCP2.6 and scarcely apply to the 1.5° policy goal. ADD: Emergency. [Peter Carter, Canada]	Noted. Note that those effects are taken into account in temperature projections.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	15				ADD to SPM: "Increased tree mortality and associated forest dieback will occur in many places in the next one to three decades" (from p. 65, line 7-8). [Peter Carter, Canada]	Due to space limitation we can not go into detail.
SPM	15				ADD to SPM: "Reduction in terrestrial carbon sink: Carbon stored in terrestrial ecosystems is vulnerable to loss back to the atmosphere. 2°C risk, with and without adaptation: medium" (from p. 68, Table 2.3). [Peter Carter, Canada]	Due to space limitation we can not go into detail.
SPM	15				ADD to SPM: "Urban risks associated with water supply systems Near term risk, with and without adaptation: medium" (from p. 69, Table 2.3). [Peter Carter, Canada]	Due to space limitation we can not go into detail.
SPM	16	2	16	2	This is inconsistent based on all the RCP tables in WGI. The CO2 from RCP2.6 is 421 ppm at 2100, and the offset from CH4 and N2O is +50 ppm, so that gives 470 ppm-eq, not 430 ppm. IF WG3 has done some new runs with MAGICC, then these are not supported by the rest of the assessment. [Government of United States of America]	Reject. The 2011 CO2-eq concentration is indeed 430ppm. This is not based on modelling, but on the assessment of the present-day atmospheric composition and radiative forcing provided in the WGI report.
SPM	16	4	16	4	after "by 2100" insert "(consistent with with a /likely/ chance to keep temperature change below 2C relative to pre-industrial levels)" cf WGIII SPM [Government of Denmark]	text has been changed and now says: " CO2eq concentrations in 2100 o about 450 ppm or lower are likely to maintain temperature cange below 2C over the century"
SPM	16	4	16	4	Please give the temperature equivalent of 450ppm as this important statement will get lost at present - many non technical people will not understand the significance of 450ppm [Government of United Kingdom of Great Britain & Northern Ireland]	Thank you, in the revised text this is done.
SPM	16	4	16	4	The authors should explain that we are already at 440-450 ppm CO2eq. This paragraph may be irrelevant. The authors can also drop the last sentence, it is obvious. [Government of United States of America]	Paragraph deleted
SPM	16	4	16	6	Please include "(consistent with a likely change to keep temperature change below 2 degrees Celsius relative to preindustrial levels)" after "2100" in the existing sentence. Reflecting how this was presented in WGIII SPM page 15. [Government of Norway]	Thank you, in the revised text this is done.
SPM	16	4	16	6	Suggested to substitute the phrase "Scenarios reaching atmospheric concentration levels of about 450 ppm CO2eq by 2100[...]" with "Scenarios consistent with a likely chance to keep temperature change below 2°C relative to pre-industrial levels by 2100[...]" [Tabaré Arroyo Currás, Mexico]	Thank you, in the revised text this is done.
SPM	16	4	16	6	This seems to be a statement of fact (describing scenarios) - why is a confidence assessment required? Suggest reviewing. [Government of Canada]	Text has been modified and the confidence assessment has been removed.
SPM	16	4	16	15	I don't tink CDR is defined yet. I think 'overshoot' needs to be defined - and is it overshoot of conc or temp or forcing [Rachel Warren, United Kingdom]	Thanks, CDR is now defined.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	4	16	15	The paragraph contains very useful information about the scale and options effective for mitigation for policy makers. Thus we suggest including all the options which characterize the 450ppm scenarios in the WG3SPM p.15 line9-13. Especially, the wordings "more rapid improvements of energy efficiency" should be included in the SYR as well. [Government of Japan]	This text has been modified.
SPM	16	4	16	15	Would be important to inform the reader about the limitations of these models. It is my understanding from the WGI TS (page 103) that accounting for an unanticipated release of GHGs from permafrost or methane hydrates is not included in studies assessed here and would reduce the anthropogenic CO2 emissions compatible with a given temperature target. [Kaisa Kosonen, Finland]	Noted. Assumptions and caveats associated with the assessment of emission budgets in the AR5 are discussed in detail in the underlying WG reports. We cannot repeat all the details here in the Synthesis report given the length limitations and the synthesis character. However, explicit references to the underlying WG reports are being provided in the SYR for easy and direct access to the detailed discussions in the WG reports.
SPM	16	4	16	15	It is unclear in context which of these technologies are included as CDR [Government of South Africa]	Text is modified so this is now clearer.
SPM	16	4	16	15	In this paragraph the expression "scenarios reaching atmospheric concentrations of ..." is used a number of times. I wonder if the wording "scenarios limiting their atmospheric concentration levels to..." or "scenarios with atmospheric concentration levels below" would better express the meaning. [Harold Leffertstra, Norway]	The text has been modified so no longer relevant.
SPM	16	4	16	15	Text not very clear, consider revising. [Helmut Haberl, Austria]	text has been revised.
SPM	16	4	16	15	This paragraph contains lots of jargon and many acronyms that have not been defined. It should be simplified and all acronyms within defined on their first use so that it is understandable by the target audience. [Peter Thorne, Norway]	The text has been rewritten to avoid confusion and jargon, and acronyms has been spelled out.
SPM	16	4	16	27	Can be shortened, [Government of Ireland]	The text has been both rewritten and restructured to improve the story line.
SPM	16	4	16	27	Inclusion of information on the scale of BECCs etc implied by various 2050 ambition levels would be of interest [Government of Ireland]	Although we agree that this information is of interest, it is not included here due to insufficient space to cover all issues of interest.
SPM	16	4	16	27	Re-draft so the first para is about what we need to do to limit warming to 2 degrees, and the 2nd para is about the consequences of delaying action (see suggestion above). [Government of United Kingdom of Great Britain & Northern Ireland]	We have taken the comment to mean that the flow and organization of the exposition is not as clear as it could be. The section has been substantially revised.
SPM	16	4		6	include .. energy systems and potentially land use. ~ include both substantial cuts .. and substantial changes in land use .. (same: page 76, line 22) [Government of Hungary]	We do not understand the concern. One sentence is in the SPM and the other is in the main body of the text.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	5			"through large-scale changes in energy systems and potentially land use". Above the SYR reflects on the fact that very ambitious climate targets need major technological and behavioural changes. As it would be rather non-trivial to interpret humans within energy systems, it would be more consistent also here to specifically mention behaviour. [Diana Urge-Vorsatz, Hungary]	Although we agree that behavior is important, this sentence is at a high level, describing only the first-level needs. Behavioral changes, policy changes, institutional changes, technological changes, and so forth, would all be part of meeting these goals.
SPM	16	6	16	6	Why "potentially" land use? Do low levels of stabilisation not require action in all areas? [Government of South Africa]	The energy system is dramatically changed in all scenarios, but not all scenarios lead to substantial changes in land use, even for the more ambitious temperature or concentration goals. At the same time, many scenarios do indicate substantial changes. The degree of changes would depend heavily on how land use is incorporated into mitigation policy
SPM	16	6	16	6	The word 'potentially' raises questions. Are there 450 ppm scenarios where deforestation does not decrease? [Government of Finland]	The energy system is dramatically changed in all scenarios, but not all scenarios lead to substantial changes in land use, even for the more ambitious temperature or concentration goals. At the same time, many scenarios do indicate substantial changes. The degree of changes would depend heavily on how land use is incorporated into mitigation policy
SPM	16	6	16	6	Include the following in red. to include at the end of the sentence. But there is a high level of uncertainty in the scenarios. [Government of Bolivia]	Rejected. The notion of uncertainty is made clear throughout the section.
SPM	16	6	16	7	Helpful and appreciate inclusion of reference to 40% to 70% reductions in GHG emissions by 2050, but somewhat incomplete and ask that the following phrase about emission levels reaching near zero or below in 2100 be added after "relative to 2010" in line with WGIII SPM: and emissions levels near zero GtCO ₂ eq or below in 2100. [Government of Japan]	The text now operates at a higher level, with less detail, and the detailed information about reductions is included in Table SPM1. Both pieces of information can be found there.
SPM	16	6	16	9	Suggested to replace "Scenarios reaching these concentrations by 2100 include 40% to 70% reductions in GHG emissions by 2050 relative to 2010, and those with more modest reductions are characterized by higher overshoot (>0.4 Wm ²) and substantial reliance on CDR technologies." with "Scenarios limiting likely temperature change to less than 2°C include 40% to 70% reductions in GHG emissions by 2050 relative to 2010, and emission levels near zero GtCO ₂ eq or below in 2100. Scenarios 'overshooting' such limits, are more likely than not to limit temperature change to less than 2°C relative to pre-industrial levels, unless they rely substantially on CDR technologies (high confidence)" if considered accurate. [Tabaré Arroyo Currás, Mexico]	The text now operates at a higher level, with less detail, and the detailed information about reductions is included in Table SPM1.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	6	16	15	These ideas show which are the most relevant pathway to reduce GHG emissions. However do not explain what the role of lifestyles and behavioral changes are. Please include some explanation about the role of lifestyles and behavioral changes to present the information of the outcome of the scenarios in a more equilibrate manner. Additionally some acronyms need to be spelled such as CDR, CCS, BECCS. [Carlos Méndez, Venezuela]	(1) Rejected. This is not the place in the text to describe all the factors -- technological, social, insitutional, behavioral -- that are associated with reducing emissions. (2) The acronynms will be clearly defined in the final text.
SPM	16	6		9	Scenarios reaching these concentrations by 2100 include 40% to 70% reductions in GHG emissions by 2050 relative to 2010, and those with more modest reductions are characterized by higher overshoot ($>0.4 \text{ Wm}^2$) and substantial reliance on CDR technologies. An addition to this comment, that at this time there are few proven techniques for CDR, and potentially none for mass scale CDR, would be helpful to focus policy makers on areas of development that require immediate financial support. [Harold David Tattershall, United States of America]	There is insiffucent space in the SPM to take on this level of detail about CDR.
SPM	16	6			why "potnetially" are there 450 ppm scanrios that don't invoke large scalle REDD,a fforestationa nd BECCS? [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The energy system is dramatically changed in all scenarios, but not all scenarios lead to substantial changes in land use, even for the more ambitious temperature or concentration goals. At the same time, many scenarios do indicate substantial changes. The degree of changes would depend heavily on how land use is incorporated into mitigation policy
SPM	16	6			After high confidance include "Mitigation scenarios in which it is likely that the temperature change caused by anthropogenic GHG emissions can be kept to less than $2 \text{ }^{\circ}\text{C}$ relative to pre-industrial levels are characterized by atmospheric concentrations in 2100 of about 450 ppm CO_2eq (high confidence) as in the 2nd paragraph of the SPM WG III page 10 [Government of Maldives]	The text now operates at a higher level, with less detail, and the detailed information about reductions and concentration is included in Table SPM1.
SPM	16	7	16	7	Please include footnote 16 from the SPM WGIII, as this is key information to policymakers. This would gtive the reader a better understanding of why the estimates has changed since AR4. In addition, it elaborates on the fact that the new range is much more dependent on negative emission technologies. [Government of Norway]	Although we consider this a good point, the material in the text now operates at a higher level, and the greater detail is provided in SPM.1. So the point is not necessarily relevant. However, the reviewer could similarly request that the footnote be added to Table SPM.1. We believe that space constraints for an SPM limit the options here, and that the footnote is not necessary. The footnote is, however, provide in Topic 3

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	7	16	7	To include what is in red. It is important to correct the following: 2100 include 25 % 40% to 70% reductions in GHG emissions by 2050 relative to 2010 [Government of Bolivia]	We do not understand the comment. This material is in the section. More generally, however, The text now operates at a higher level, with less detail, and the detailed information about reductions and concentration is included in Table SPM1.
SPM	16	8	16	8	The abbreviation "CDR" is used here but not explained until later. [Government of Sweden]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	Would help policymakers to spell out CDR (Carbon Dioxide Removal) and to include an example of CDR when it first appears here in the AR5 SYR SPM. Further, reference merely to "substantial reliance" on CDR technologies without information on challenges and risks of CDR technologies" seems to deviate from a more balanced message conveyed across the three AR5 WG SPMs, and should have more discussion about the challenges and risks of CDR technologies. Suggest inclusion of the following lines from AR5 SYR longer report P76, line15: The availability and scale of BECCS, afforestation, and other Carbon Dioxide Removal (CDR) technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks. [Government of Japan]	The final text editing will address the introduction and use of acronyms. Text about potential limits of CDR and issues surrounding CDR has now been added, although it does not exactly match the text suggested by the reviewer.
SPM	16	8	16	8	CDR : This is the first time that this abbreviation is used in the SPM, it should be explained (Carbon Dioxide Removal) [Thomas Stocker/ WGI TSU, Switzerland]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	Since this is the first time CDR is mentioned in the SPM. Please consider to use this occasion to spell it out and establish the use of abbreviation by replacing "CDR" with "Carbon Dioxide Removal (CDR)". Also, please consider to include some text that describes the different CDR technologies that are included in the mitigation scenarios with special emphasis on their maturity, opportunities and challenges. [Government of Norway]	The final text editing will address the introduction and use of acronyms. Text describing that most CDR is from bioCCS and from afforestation is included in the SPM.
SPM	16	8	16	8	explain abbreviation CDR [Monika Rhein, Germany]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	This is the first use of "CDR" and there is no explanation provided. Suggest adding one. [Government of Canada]	The final text editing will address the introduction and use of acronyms.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	8	16	8	This is the first mention of 'overshoot' scenarios. This is an important concept to explain to policymakers. Suggest making space to do so. What is being overshoot: targets for radiative forcing, atmospheric GHG or CO2 concentrations, global temperature? What is the timeframe then for achieving the target? Explain how it is possible to lower atmospheric concentrations or temperature after overshooting. Also, it may be helpful to readers if the SYR could use consistent radiative forcing units throughout. Suggest using CO2eq units, rather than W/m2 if possible. [Government of Canada]	(1) The concept of concentration overshoot is more clearly introduced in the new draft. (2) However, there is insufficient space in the SPM to discuss the physical character of the climate system that allows overshoot to work. (3) Text is now largely written in CO2eq and tempeature.
SPM	16	8	16	8	CDR/Carbon Dioxide Removal: Explain the abbreviation/notion in the beginning (explained on p. 76) Please consider addition information from Section 4.1 of the WG3 SPM on the role and risks of CDR in these scenorios. [Government of Germany]	The final text editing will address the introduction and use of acronyms. Text about potential limits of CDR and issues surrounding CDR has now been added, although it does not exactly match the text suggested by the reviewer.
SPM	16	8	16	8	The word 'overshoot' and CDR need an explanation, e.g. in glossary. [Government of Finland]	The final text editing will address the introduction and use of acronyms. A footnote on overshoot is now included.
SPM	16	8	16	8	Please spell out the acronym CDR (Carbon Dioxide Removal) [Government of Belgium]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	This is the first time the units of W/m2 are used. Can this be converted to CO2e? [Government of United States of America]	The text now largely works in temperature and CO2eq.
SPM	16	8	16	8	This is the first mention of CDR, so it should be spelled out here. [Government of United States of America]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	First and only time that Wm2 is mentioned in the SPM -no reference to radiative forcing, etc. [H-Holger Rogner, Austria]	The text now largely works in temperature and CO2eq.
SPM	16	8	16	8	First time use of CDR - spell out Carbon dioxide removal (CDR) [H-Holger Rogner, Austria]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	Please avoid using an unexplained abbreviation for CDR [Government of France]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	8	"by higher overshoot": would have to say higher to what? Does this sentence mean that all scenarios include an overshoot? Also, in an SPM, it might be good to define what overshoot means... [Government of France]	The phrase is no longer found in the new draft. Overshoot is defined in a footnote.
SPM	16	8	16	8	It is necessary to define what is meant by "CDR technologies" [Government of France]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	9	This is a very prescriptive form to suggest the use of an particular technology, you are indicating the sectors. The CDR technologies acronim is use without specifying what does it stands for. Your are promoting a particular business interest here, you should take into consideration the issues concerning the UNFCCC provision on technologies. [Government of Venezuela]	The authors are suggesting no course of action, only identifying the nature of the underlying research. The final text edit will ensure that acronyms are appropriately introduced.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	8	16	9	Include "Carbon Dioxide Removal" after CDR. [Government of Chile]	The final text editing will address the introduction and use of acronyms.
SPM	16	8	16	11	There is inconsistency of style concerning abbreviations. On line 8, CDR isnt spelt out, while on line 11, CCS is. [Keith Shine, United Kingdom]	The final text editing will address the introduction and use of acronyms. A footnote on overshoot is now included.
SPM	16	8		9	higher overshoot (>0.4 W/m2) and substantial reliance on CDR technologies' needs explanation [Government of United Kingdom of Great Britain & Northern Ireland]	The final text editing will address the introduction and use of acronyms. The point about the level of overshoot is no longer present in the revised and reorganized text.
SPM	16	8			The term CDR is introduced for the first time in this line. Suggest to spell out the full name. [Government of Ireland]	The final text editing will address the introduction and use of acronyms.
SPM	16	8			First appearance of acronym CDR, with no definition. This later defined inconsistently in page 76 line 16 (Carbon Dioxide Removal) and Box 3.3 on page 92 (Carbon Dioxide Reduction). [Government of Netherlands]	The final text editing will address the introduction and use of acronyms.
SPM	16	8			Change "CDR" to "Carbon Dioxide Removal (CDR)". The abbreviation appears first time in the report. [Government of Republic of Korea]	The final text editing will address the introduction and use of acronyms.
SPM	16	8			repalce "CDR" with Carbon dioxide removal technologies, to reduce acronyms, especially those not spelt out before [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The final text editing will address the introduction and use of acronyms.
SPM	16	8			The acronym "CDR" has not been used before this, so please provide an expansion of it (within parentheses). [David Wratt, New Zealand]	The final text editing will address the introduction and use of acronyms.
SPM	16	8			CDR: as this is the 1st reference to it in the SYR, it'd correct to add: Carbon Dioxide Removal (CDR) [Government of Hungary]	The final text editing will address the introduction and use of acronyms.
SPM	16	9	16	9	The range 40-70 percent GHG reductions 2010-2050 builds upon several important assumptions that are different compared to the similar range of 50-85 percent CO2 reductions from 2000-2050 from AR4. But Figure WGIII Figure SPM.7 indicate a limited potential to reduce the non-CO2 GHG. According to WGIII Figure SPM.7 most scenarios seems to achieve a stabilisation of non-CO2 GHG by 2050, and more than 40-70 percent reductions in CO2. Please consider including e.g. "In most scenarios the level of CO2 reductions by 2050 are higher than the level of overall GHG reductions." . [Government of Norway]	This is more detail than even provided in the WG3 SPM. Due to the tight space constraints, we do not included this information.
SPM	16	9	16	9	Suggested to substitute the phrase "Scenarios reaching these concentrations [...]" with "Scenarios reaching these temperature change limits[...]" [Tabaré Arroyo Currás, Mexico]	The sentence no longer exists in the revised version, so the comment is no longer applicable.
SPM	16	9	16	9	Missing a "by" in "...these concentrations are also characterized by a tripling..." [Government of Canada]	The sentence no longer exists in the revised version, so the comment is no longer applicable.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	9	16	9	Energy efficiency needs to be included, as it is in the SPM of WGIII, page 13 ("At the global level, scenarios reaching 450 ppm CO ₂ eq are also characterized by more rapid improvements of energy efficiency, a tripling to nearly a quadrupling of the share of zero- and low-carbon energy supply from renewables,..." [Government of Belgium])	This just provides an overview. We cannot provide all details. Have revised the text to make it more balanced.
SPM	16	9	16	9	It would be logical here to say what emissions would be required in 2100. [Government of United States of America]	The text now operates at a higher level, with less detail, and the detailed information about reductions is included in Table SPM1. Information about 2100 can be found there.
SPM	16	9	16	9	"by" missing between "characterized" and "a tripling..." [Helmut Haberl, Austria]	Editorial
SPM	16	9	16	9	It is suggested to insert "by" before "a tripling to nearly .." [Government of Austria]	Editorial
SPM	16	9	16	12	The description of "zero- and low-carbon energy supply from renewables, nuclear energy..." should be kept as it is because this part is inevitable to indicate various technologies for zero- and low-carbon energy supply. From a viewpoint of the effect of CO ₂ reduction, nuclear power has huge potential and necessary power source. [Hirofumi Kazuno, Japan]	This paragraph no longer exists in the current text due to reorganization, so the comment is no longer applicable.
SPM	16	9	16	12	Please rather use the formulation of the SPM, WG3 P. 23 L. 19-22: "In the majority of low-stabilization scenarios, the share of low-carbon electricity supply (comprising renewable energy (RE), nuclear and CCS) increases from the current share of approximately 30% to more than 80 % by 2050, and fossil fuel power generation without CCS is phased out almost entirely by 2100." [Government of Germany]	This is too much detail for the SPM.
SPM	16	9		11	tripling as compared to what? Also, since presently a huge share of today's energy supply is traditional biomass, this tripling needs to be reflected on. Is this in addition to the replacement of traditional biomass by commercial fuels/renewables? [Diana Urge-Vorsatz, Hungary]	This paragraph no longer exists in the current text due to reorganization, so the comment is no longer applicable.
SPM	16	10			quadrupling of the share of zero- and low-carbon energy supply from renewables, nuclear energy and fossil: would it be more correct to write here "and/or" in both cases (in line with the mandate, i.e. to be: policy-relevant and yet policy-neutral, never policy-prescriptive) (same for page 76 line 28) [Government of Hungary]	This paragraph no longer exists in the current text due to reorganization, so the comment is no longer applicable.
SPM	16	12	16	12	Editorial: Need a space before "They": "2050. They describe (...)" [Government of Norway]	Editorial
SPM	16	12	16	12	To incorporate: According to WGI, CDR methods have biogeochemical and technological limitations to their potential on the global scale. There is insufficient knowledge to quantify how much CO ₂ emissions could be partially offset by CDR on a century timescale. CDR methods carry side-effects and long-term consequences on a global scale. [WGIII footnote 18] [Government of Bolivia]	The paragraph discussing CDR includes a sentence on the limits associated with CDR.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	13	16	15	Suggested to substitute the phrases "Scenarios reaching higher concentrations[...]" and " On the other hand, scenarios reaching lower concentrations[...]" by "Scenarios exceeding temperature change limits[...]" and "On the other hand, scenarios achieving lower temperature changes[...]" [Tabaré Arroyo Currás, Mexico]	The text has been improved, although not precisely in the way the reviewer suggests.
SPM	16	13	16	15	Could the last two sentences be combined by using: 'the lower the concentrations, the shorter the timescales required' -logic..... OR delete 'On the other hand' from the latter sentence. [Government of Finland]	The new version uses different text.
SPM	16	13			(1) Reduce deforestation, (2) afforestation and (3) bioenergy production [Renato Braghieri, United Kingdom of Great Britain & Northern Ireland]	Editorial. Regardless, the section has been revised substantially, so this material no longer exists.
SPM	16	14	16	14	It is suggested to substitute "slower timescale" by the following wording: "longer timescale respectively slower speed". [Government of Austria]	The new version uses different text.
SPM	16	14	16	15	Please consider to replace "require these changes" with "require implementation of these changes" [Government of Norway]	The new version uses different text.
SPM	16	15	16	15	Please cite here also the indicative emission reductions that are consistent with 430 ppm scenarios. [Kaisa Kosonen, Finland]	The detail is no longer provided in the text here. Instead, the detail is provided in Table SPM.1. However, it should be noted that this table does not include the details on the scenarios reaching concentrations below 430 by the end of the century, because this space is insufficiently explored in the literature.
SPM	16	15	16	15	Please consider including the following sentences, reflecting how this was presented in SPM WGIII (Section 4.1) on the risks related to substantial reliance on CDR technologies: "Mitigation scenarios reaching about 450 ppm CO ₂ eq in 2100 typically involve temporary overshoot of atmospheric concentrations, as do many scenarios reaching about 500 ppm to 550 ppm CO ₂ eq in 2100. Depending on the level of the overshoot, overshoot scenarios typically rely on the availability and widespread deployment of BECCS and afforestation in the second half of the century. The availability and scale of these and other Carbon Dioxide Removal (CDR) technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks (high confidence)." [Government of Norway]	Similar language is now in the text, although the last sentence has been altered, and there is one additional sentence.
SPM	16	15			• SPM [P16 L4-15] full text included in WG III SPM p. 15 provides more options for policymakers. [Government of Saudi Arabia]	Similar language is now in the text, although the last sentence has been altered, and there is one additional sentence.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	16			<p>• SPM [P 16 L 16] insert 'Mitigation scenarios reaching about 450 ppm CO₂eq in 2100 typically involve temporary overshoot of atmospheric concentrations, as do many scenarios reaching about 500 ppm to 550 ppm CO₂eq in 2100. Depending on the level of the overshoot, overshoot scenarios typically rely on the availability and widespread deployment of BECCS and afforestation in the second half of the century. The availability and scale of these and other Carbon Dioxide Removal (CDR) technologies and methods are uncertain and CDR technologies and methods are, to varying degrees, associated with challenges and risks (see Section SPM 4.2) (high confidence).¹⁸ CDR is also prevalent in many scenarios without overshoot to compensate for residual emissions from sectors where mitigation is more expensive. There is only limited evidence on the potential for large-scale deployment of BECCS, large-scale afforestation, and other CDR technologies and methods (from WGIII SPM page 15 para 2) [Government of Saudi Arabia]</p>	Similar language is now in the text, although it has been slightly altered to fit the form and flow of the SPM.
SPM	16	17	16	17	<p>The first part of this sentence is a bit confusing, a possible fix could be: "Delaying the upscaling of mitigation efforts through 2030...". [Government of Norway]</p>	The sentence has been rewritten for clarity and simplicity.
SPM	16	17	16	17	<p>"beyond those already in place" - what is in place other than Copenhagen and Cancun accords? [Government of United States of America]</p>	The phrase is no longer there.
SPM	16	17	16	19	<p>"Delaying mitigation efforts beyond those in place today through 2030 is estimated to substantially increase the difficulty of the transition to low longer-term emissions levels and narrow the range of options consistent with maintaining temperature change below 2 C relative to pre-industrial levels (high confidence). " it is unclear where the likelihood stems from in the SYR 3.2 chapter. The statement is much more elaborate than the pieces found in SYR 3.2 and Table 3.2 in SYR 3.2 respectively. [Government of Netherlands]</p>	The sentence has been rewritten for clarity and simplicity.
SPM	16	17	16	19	<p>'narrow the range of options' may sound as an understatement. Stronger language (e.g. 'significantly narrow') may be more appropriate to accurately reflect the current scientific assessments. [European Union]</p>	The sentence has been rewritten for clarity and simplicity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	17	16	20	We wonder if the statement "Delaying mitigation efforts beyond those in place today through 2030 is estimated to substantially increase the difficulty of the transition to low longer-term emissions levels and narrow the range of options consistent with maintaining temperature change below 2 C relative to pre-industrial levels (high confidence)" needs to be better supported in the underlying SYR text in Section 3.2. We could not find a sentence following exactly the SPM statement in SRY {3.2}, especially not with the "high confidence" attached. The statements getting closest seem to be the following: "The Cancun Pledges do not do not eliminate the option to maintain likely temperature change below 2°C or an end-of-century concentration of about 450 to 500 ppmv CO2eq or below (medium confidence); however, they are not on a pathway to most cost-effectively meet these goal and increase the challenge of doing so (high confidence)." (SYR page 81, lines 7 to 10) AND : "Delaying additional mitigation will substantially increase the challenges of, and reduce the options for, limiting temperature increase to 2°C or reaching 450 ppmv CO2eq by 2100." (SYR page 80 lines 8 and 9). So do these SYR statements provide the necessary support for the "high confidence" statement given the SYR SPM ? [Thomas Stocker/ WGI TSU, Switzerland]	The sentence has been rewritten for clarity and simplicity.
SPM	16	17	16	20	Suggested to delete phrase "[...]increase the difficulty of the transition to low longer-term emissions levels and[...]" So it reads: "Delaying mitigation efforts beyond those in place today through 2030 is estimated to substantially narrow the range of options consistent with maintaining temperature change below 2 C relative to pre-industrial levels (high confidence)." [Tabaré Arroyo Currás, Mexico]	The sentence has been rewritten for clarity and simplicity.
SPM	16	17	16	27	Headline is unclear. Suggest reword eg "Delaying implementation of mitigation efforts additional to those already in place today until 2030 is estimated to ... [Rachel Warren, United Kingdom]	The sentence has been rewritten for clarity and simplicity.
SPM	16	17			This is an example of where the density of numbers and abbreviation makes the text almost impossible to read and understand for those who are not already familiar with all the shorthand language (and they probably don't need to read the SPM) [Government of Sweden]	The text has been rewritten for clarity and simplicity.
SPM	16	17			Suggest changing "is estimated to" to "will", which is more appropriate language for using a confidence statement. [Government of Canada]	The text has been rewritten for clarity and simplicity.
SPM	16	19	16	19	2 C --> ° is missing [Thomas Stocker/ WGI TSU, Switzerland]	Editorial
SPM	16	19	16	19	Editorial: Need a degree-symbol (°) between 2 and C [Government of Norway]	Editorial
SPM	16	19	16	19	error in unit of temperature, 2 C replaced with 2 °C [Guomo Zhou, China]	Editorial
SPM	16	19			Change "2 C" to "2 °C". Degree symbol is missing. [Government of Republic of Korea]	Editorial
SPM	16	19			"2 C" should be "2oC" [Government of Vietnam]	Editorial

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	20	16	20	Is "Cost effective" the right attribute? As opposed to "not cost-effective"? How to find the difference? [Jochen Harnisch, Germany]	Cost-effective is the right attribute.
SPM	16	20	16	20	Could a statement be provided for the case of "likely" level scenarios viz. 2oC? [Government of Sweden]	The literature was not assessed in this way, so it is not included here.
SPM	16	20	16	20	"as likely as not" should be "about as likely as not" in italic to follow the IPCC Terminology. [Government of Japan]	Agreed. However, this text has been removed and simpler text is now in its place in the new version.
SPM	16	20	16	20	The definition of "Cost effective mitigation scenarios" should be added to footnote because it is a technical term. WGIII Table SPM.2 footnote.1 "Cost-effective scenarios assume immediate mitigation in all countries and a single global carbon price, and impose no additional limitations on technology relative to the models' default technology assumptions" [Government of Japan]	Such a definition is provided in caption to new Figure SPM.13.
SPM	16	20	16	20	"at least as likely as not" -- is this representing a formal uncertainty assessment according to the WGIII terms? If so, it should probably be given in italic [Thomas Stocker/ WGI TSU, Switzerland]	Agreed. All formal uncertainty terms will be italicized in the final.
SPM	16	20	16	20	For policymakers it is important to know how cost-effective scenarios are defined. We are puzzled to see that scenarios with emissions in 2030 as high as the recent emissions are included in this "cost-effective" category. [Government of Belgium]	There are many different pathways depending on model configurations. This WG3 SPM finding holds, but we have simplified the text a little here.
SPM	16	20	16	23	"cost effective scenario" should be explained here [Thomas Stocker/ WGI TSU, Switzerland]	Such a definition is provided in caption to new Figure SPM.13.
SPM	16	20	16	23	Please consider to use the 450 ppm annotation used in other parts of the SPM rather than "between about 450 and 500 ppm CO2eq". [Government of Norway]	For consistency across the SYR, this section is moving more heavily toward a temperature framing.
SPM	16	20	16	23	Please consider to include information in this statement that the carbon budget of about 1000 GtCO2 (including non-CO2 forcings) to reach the 2 degree goal will be used up if annual emissions before 2030 stays at approx 50 Gt CO2eq yr-1. [Government of Norway]	This is another way to describe the issue, but it has not been included here.
SPM	16	22	16	23	This statement seems overly cautious by saying roughly between 30 and 50 GtCO2eq. Please consider removing the word "roughly". [Government of Norway]	The sentence has been removed.
SPM	16	22	16	23	This section begins the very confusing usage of CO2-eq in terms of RF and in terms of emissions. The problem with this whole section is that it is LONG TERM and CO2-eq emissions emphasize short and long term here. The authors need to address this. [Government of United States of America]	The paragraph has been rewritten, and this sentence no longer appears. However, more generally, the point of this portion the section is explicitly to link the short and long-term together, which the authors consider to be critical.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	23	16	23	The word "Such" needs to be inserted at the beginning of the sentence that starts on this line because there is a need to bring forward the type of scenarios this is referring to. [Government of United States of America]	The sentence has been removed.
SPM	16	23	16	23	It would be helpful here to state present emissions, as a point of comparison. [Government of United States of America]	The sentence has been removed.
SPM	16	26	16	26	To separate the listing better please consider to include a semi-colon after "in the long term" [Government of Norway]	Agreed.
SPM	16	26	16	26	It is important to also mention the challenges and risks associated to CDR, as mentioned in Box 3.3 : "CDR methods vary greatly in their costs, their risks to humans and the environment, and their potential scalability, as well as in the amount of research there has been about their potentials and risks." [Government of Belgium]	The limitations associated with CDR are addressed elsewhere in the SPM.
SPM	16	26			Include reference to the risks and challenges associated with CDR when these technologies are first mentioned - see re-worked paras about 2 degrees and the consequences of delayed action. [Government of United Kingdom of Great Britain & Northern Ireland]	This is included elsewhere in the section.
SPM	16	28	16	28	Please consider to include Table 3.1 and expand it with values for temperature (as in WGIII Table SPM.1) and sea level rise. Rationale: Both temperature and sea-level rise are policy relevant factors. For sea-level rise the numbers are given in the WGI report (for all RCPs). In this way it will also be comparable to what was presented in Table SPM. 6 in AR4 SYR. [Government of Norway]	Table SPM.1 is now included. Sea-level rise is not included, because it was not assessed as part of this literature.
SPM	16	29	16	29	Before refering to the Cancun Pledges, something important that it is missing is the second commitment period of the Kyoto Protocol (2012-2020/ 8 years). Surprise the inclusion of a pledges of a COP decision (COP/16), and not the inclusion of an international instrument that represent in conjunction to the Convention (Kyoto Protocol) the current international regimen of climate change. [Government of Venezuela]	The Cancun pledges are an important consideration in international climate negotiations. They are therefore the focus here.
SPM	16	29	16	31	grammar seems not quite right (the pledges are subject to challenges?), suggest rephrasing the latter part: "and therefore increased mitigation effort is required, if temp increase is to be maintained below 2C relative to pre-industrial" [Government of Denmark]	A simpler sentence is used in the revised version.
SPM	16	29	16	31	Please consider to highlight this finding by bolding it. Rationale: We believe that this is key information to policymakers that want to increase their efforts in the short-term. [Government of Norway]	The section has largely been rewritten, and bolded sentences are no longer included.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	29	16	31	The Cancun pledges are for 2020 and so statements about emissions pathways by 2030 clearly make assumptions beyond those in the commitments made by Parties. These assumptions - whether the Cancun pledges are linear extended, or modelers assumptions followed - are not clearly stated here. The association with 2 degC seems even more tenuous. Are there NO emissions pathways that follow Cancun commitments up to 2020, and then later possible with steep decline by 2100, that keep 2 degC in reach? Too many factors are mixed in this sentence. Analysis of Parties commitments should be presented distinctly from modelers' assumptions [Government of South Africa]	The statement about the Cancun pledges is not based on extrapolation. It is merely an observation about which cost-effective scenarios pass through the Cancun Pledges.
SPM	16	29	16	31	This sentence is very policy relevant. It deserves bold face ; a reference here to Fig SPM-8a would also be helpful. [Tony Weir, Australia]	The section has largely been rewritten, and bolded sentences are no longer included.
SPM	16	29	16	31	We suggest to highlight this sentence (bold). [Government of Belgium]	The section has largely been rewritten, and bolded sentences are no longer included.
SPM	16	29	16	31	The first sentence is not immediately very easy to understand for those who just want to know if it's consistent with a 2degC pathway or not. The wording in the WGIII was better. [European Union]	A simpler sentence is used in the revised version.
SPM	16	29	16	34	Reword. 'The Cancun pledges are not consistent with emission pathways that are characterized by annual GHG emissions in 2030 below 50GtCO ₂ eq. If temperature increase is to be constrained to below 2C relative to pre-industrial levels, additional mitigation efforts are required. [Rachel Warren, United Kingdom]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	29	16	34	Text on Cancun Pledges differs from approved text in AR5 WGIII SPM and AR5 SYR longer report. To ensure consistency with approved AR5 WGIII text, request revision of text to match WGIII SPM text (similar comment made for SYR P81, lines7-12): Estimated global GHG emissions levels in 2020 based on the Cancun Pledges are not consistent with cost-effective long-term mitigation trajectories that are at least as likely as not to limit temperature change to 2°C relative to pre-industrial levels (2100 concentrations of about 450 and about 500 ppm CO ₂ eq), but they do not preclude the option to meet that goal (high confidence). Meeting this goal would require further substantial reductions beyond 2020. The Cancun Pledges are broadly consistent with cost-effective scenarios that are likely to keep temperature change below 3°C relative to preindustrial levels. [Government of Japan]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	29	16	34	please clarify on what part of syr this paragraph is based. It does not seem to relate to SYR 3.2 [Government of Netherlands]	The Cancun discussion is explicitly based on text in 3.4. The point about models not producing scenarios has been removed from the SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	29	16	34	This section lacks a bolded sentence, but is very policy relevant. We suggest to add a bolded sentence: "Established and proposed mitigation policies will not suffice to limit climate change to below 2°C." [Government of Netherlands]	The section has largely been rewritten, and bolded sentences are no longer included.
SPM	16	29	16	34	This wording about the Cancun Pledges is less clear than the statements that were made in the WGIII SPM. Consider revising and strengthening this wording. The phrase "and are therefore subject to increased mitigation challenges, if temperature increase is maintained below 2°C relative to pre-industrial levels" on line 30-31 is very important, but the wording is confusing and should be more clear and direct. For example, replace with "and thus is it extremely unlikely that their enactment would result in maintaining temperature below 2°C relative to pre-industrial levels, therefore further mitigation is required to meet this goal." Consider also whether a footnote should be added to the SYR explaining what the Cancun Pledges are. [Government of Canada]	A simpler sentence, more consistent with the approved WG3 language, is now being used.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	29	16	34	<p>We strongly recommend to use the carefully drafted text from AR 5 WGIII using the two paras on P 13 of the edited version:</p> <p>"Estimated global GHG emissions levels in 2020 based on the Cancún Pledges are not consistent with cost-effective long-term mitigation trajectories that are at least as likely as not to limit temperature change to 2 °C relative to pre-industrial levels (2100 concentrations of about 450 and about 500 ppm CO₂eq), but they do not preclude the option to meet that goal (high confidence). Meeting this goal would require further substantial reductions beyond 2020. The Cancún Pledges are broadly consistent with cost-effective scenarios that are likely to keep temperature change below 3 °C relative to preindustrial levels."</p> <p>"Delaying mitigation efforts beyond those in place today through 2030 is estimated to substantially increase the difficulty of the transition to low longer-term emissions levels and narrow the range of options consistent with maintaining temperature change below 2 °C relative to pre-industrial levels (high confidence). Cost-effective mitigation scenarios that make it at least as likely as not that temperature change will remain below 2 °C relative to pre-industrial levels (2100 concentrations between about 450 and 500 ppm CO₂eq) are typically characterized by annual GHG emissions in 2030 of roughly between 30 GtCO₂eq and 50 GtCO₂eq (Figure SPM.5, left panel). Scenarios with annual GHG emissions above 55 GtCO₂eq in 2030 are characterized by substantially higher rates of emissions reductions from 2030 to 2050 (Figure SPM.5, middle panel); much more rapid scale-up of low-carbon energy over this period (Figure SPM.5, right panel); a larger reliance on CDR technologies in the long-term (Figure SPM.4, top panel); and higher transitional and long-term economic impacts (Table SPM.2). Due to these increased mitigation challenges, many models with annual 2030 GHG emissions higher than 55 GtCO₂eq could not produce scenarios reaching atmospheric concentration levels that make it as likely as not that temperature change will remain below 2 °C relative to pre-industrial levels." [Government of Germany]</p>	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	29	16	34	<p>This important message is obscured by opaque language and should be replaced with the text on Cancun Pledges suggested above. [Government of United Kingdom of Great Britain & Northern Ireland]</p>	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	29	16	34	<p>These statements regarding Cancun pledges need to be simpler and more clear. Is the phrase "BELOW 50 GtCO₂eq" intended or should that be "AT OR ABOVE 50 GtCO₂eq"? [Suggest comparing with statements on p. 80, lines 11-16.] Further, the ending phrase should be edited to read, "...if the aim is to maintain temperature increase to below 2C relative to pre-industrial levels." In the last sentence suggest deleting beginning phrase "Due to these increased mitigation challenges,". [Government of United States of America]</p>	A simpler sentence, more consistent with the approved WG3 language, is now being used.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	29	16	34	Is the assessment of the adequacy of "Cancun Pledges" an appropriate judgement for the IPCC to make? And what peer-reviewed publications support such assessment? If there is no peer-review publication to support it, then delete that paragraph. If there are, the appropriate references to the underlying WG reports should be made. [Government of United States of America]	This assessment is easily made by comparing the emissions of cost-effective scenarios in 2020 with the possible range of emissions associated with the Cancun pledges.
SPM	16	29	16	34	The text regarding Cancun pledges should be removed, because this is a political matter and they will be out of date by the end of 2015 (a new agreement will be elaborated). [Government of Russian Federation]	The authors disagree. They consider the information very relevant as an indicator of whether current pledges are consistent with the long-term goals explored here.
SPM	16	29	16	34	This statement needs a likelihood statement or confidence statement associated with it. [Peter Thorne, Norway]	Noted.
SPM	16	29			Too complex. Please break up the sentence. [Government of Sweden]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	29			In the third paragraph, first line the word Mexico should appear; in order to remind those who might not identify it quickly, where the Cancun pledges come from. [Government of Costa Rica]	The name, "Cancun Pledges" seems sufficient.
SPM	16	29			may need a footnote explainign what the Cancuun pledges are and providing a link [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The Cancun Pledges are well-known to the policy community that will be reading the summary for policy makers. This clarification is unnecessary.
SPM	16	29			Add a one sentence/paragraph description of the Cancun Pledges [Alessandra Conversi, United Kingdom]	This is not appropriate for an SPM.
SPM	16	29			The Cancun Pledges .. by annual GHG: The Cancun Pledges is a rather unofficial term and since 2010 many things have happened regarding the various "pledges" (un- and conditional and commitments by developed countries) incl. those which are inscribed in the Doha Amendment (2012). A diff. way is needed to formulate this important message, e.g.: The existing emission control pledges (commitments by the developed countries and actions by the developing countries). It would also be good to add: ".. by global annual GHG" [Government of Hungary]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	30	16	30	The wording here is odd - as stated is reads as though the Cancun Pledges are subject to challenges. Are the pledges themselves subject to challenges - or is the long-term global goal (i.e.,2C above pre-industrial) what is subject to increased mitigation challenges. [Government of United States of America]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	30			the cancuun pledges are not subject to mitigation challenges, they are just pledges, perhaps instead "and therefore imply the need for increased mitigation challenges [Joanna House, United Kingdom of Great Britain & Northern Ireland]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31	16	31	Editorial: Delete one of the "." [Government of Norway]	A simpler sentence, more consistent with the approved WG3 language, is now being used.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	31	16	31	The words "to be" should be added to the sentence: "...if temperature increase is to be maintained..." [Government of Norway]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31	16	31	Suggest to insert "to be" between "is" and "maintained, so the sentence reads "..., if temperature increase is to be kept below 2 degrees C relative to...". This to make the sentence easier to understand for the Policymaker improve the undcould [Harold Leffertstra, Norway]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31	16	31	"pre-industrial levels.." . There is surplus for full stop in this sentence. [Guomo Zhou, China]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31	16	31	"is maintained" should be "is to be maintained." [Government of United States of America]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31	16	31	is to be maintained [Peter Thorne, Norway]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31	16	34	This statement could not be found in Section {3.2}, but perhaps it is based on what is given in note 5 on page 79) [Thomas Stocker/ WGI TSU, Switzerland]	This sentence has been removed.
SPM	16	31	16	34	If this is to say that emissions higher than 55 GTCO2eq in 2030 is inconsistent with 2 degree goal, the point should be made clearer. Please consider to reformulate so that the intention with the finding communicates better. [Government of Norway]	This sentence has been removed.
SPM	16	31	16	34	Would it be possible to split the last sentence in order to improve readability? [Government of Finland]	This sentence has been removed.
SPM	16	31	16	34	The sentence starting with "Due to these increased mitigation challenges, ..." seems to belong to the previous paragraph. [Government of France]	This sentence has been removed.
SPM	16	31			Delete a duplicated period symbol (".."). [Government of Republic of Korea]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31			Section 3: There is no information given to help the reader transition from the earth system model, RCP based, projections of future climate change to integrated assessment models and the baseline and policy scenarios assessed by WGIII. In many cases, SPM makes reference to "models" in several places, and occasionally does so without any specific context Some minimal information about the various scenarios classes and how the scenarios are constructed would be helpful here at the beginning of Section 3. Alternately, a box could be added near the beginning of the SPM to explain models and scenarios in the report. [Government of Canada]	Some discussion of scenarios, both from the ESMs and from the IA models, is in Section 2.
SPM	16	31			"is to be maintained" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	31			Insert "to be" so that this line would read "temperature increase is to be maintained below 2°C relative to pre-industrial levels" [Government of Maldives]	A simpler sentence, more consistent with the approved WG3 language, is now being used.
SPM	16	33	16	33	Could a statement be provided for the case of "likely" level scenarios viz. 2oC? [Government of Sweden]	This sentence has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	16	33	16	33	"as likely as not" -- is this representing a formal uncertainty assessment according to the WGIII terms? If so, it should probably be given in italic. Is there a an "about" missing, i.e., should it not say "about as likely as not"? [Thomas Stocker/ WGI TSU, Switzerland]	This sentence has been removed.
SPM	16	33			"as likely as not" should be italicised. [David Wratt, New Zealand]	This sentence has been removed.
SPM	16	34			Please consider to include the following sentence from AR5 WGIII SPM page 13: "The Cancun pledges are broadly consistent with cost-effective scenarios that are likely to keep temperature change below 3°C relative to pre-industrial levels." [Government of Norway]	This sentence has been removed.
SPM	16	34			It would be very informative to reflect mitigation pathways at the sector level as well. This provides key information about the future mitigation challenges. Please consider including information from WGIII Figure SPM.7. This could be done preferably by including the Figure itself or summarizing in text form the differences between the baseline scenario and mitigation scenarios in the different sectors. [Government of Norway]	This sentence has been removed.
SPM	17	1	17	1	any way of adding in say the left-hand panel a link to temperature or which emissions pathways lead to 2°C? True, it's not in the chart in the WGIII report but I think it's in some WGIII presentations and it's the key policy-relevant point. [Jonathan Lynn, Switzerland]	We have replaed the figure by a simplified version
SPM	17	1	17	17	Figure SPM 8 contains a wealth of useful information - but key messages in it are obscure. It should clearly show the achievability (or lack of achievability) in staying under 2 deg C in 2100. [European Union]	We have replaed the figure by a simplified version
SPM	17	3	17	17	As written, the caption is too complicated. Please simplify the text. [Government of United States of America]	The figure and its caption have been simplified to make it more accessible.
SPM	17	3			Figure SPM.8: The synthesis of information into the three panels is nicely done, but consider enlarging this figure to make it easier to read. Consider whether using three starkly different colours rather than three shades of green would make this graphic easier to interpret. [Government of Canada]	The figure and its caption have been simplified to make it more accessible.
SPM	17	4			please specify what the numbers in brackets mean (430-530)? [Government of Netherlands]	The figure and its caption have been simplified to make it more accessible.
SPM	17	7	17	7	Information about Cancun pledges should be removed from picture SPM.8 and from the text in line 7. The reason explained above (see comment #1). [Government of Russian Federation]	The figure and its caption have been simplified to make it more accessible.
SPM	17	17	17	17	(Figure 3.3) should be between braces {} and no parenthesis [Thomas Stocker/ WGI TSU, Switzerland]	The figure and its caption have been simplified to make it more accessible.
SPM	17	19	17	19	This is an important statement that should precede all other summaries of socioeconomic impacts and discussion of mitigation. [Government of United States of America]	The statmemnet remains in the new version.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	19	17	21	The statement is much more elaborate than its counterpart in p. 77, l. 13-14: "Estimates of the aggregate economic costs of mitigation vary widely based on methodologies and other assumptions (high confidence)." please make it more consistent [Government of Netherlands]	Agreed and done
SPM	17	19	17	21	This seems to be statement of fact (estimates vary widely, etc.), so it is not evident that a confidence assessment is required. [Government of Canada]	Agreed and removed.
SPM	17	19	17	21	This statement seems to say there is a high evidence of a large uncertainty. What is the purpose of saying so; rewrite the sentence to clarify it and to make clear the purpose of such sentence. [Government of United States of America]	Disagree. The key point of the sentence is that there is a great deal of uncertainty about the economic costs. This is a very important point.
SPM	17	19	17	27	How do the results on costs of mitigation relate to those found by the Stern Review ? The result that 'costs of action' were between -1% and +3% of GDP is known to many policy-makers, and so it would be helpful to know how this assessment confirms or revises that finding. [Government of South Africa]	The comparison with the Stern review is not needed here.
SPM	17	19	17	27	Could we rephrase this to make it simpler? For instance to say that the prosperity we would have achieved in 2050 is delayed until 2051. [Government of United Kingdom of Great Britain & Northern Ireland]	The paragraph has been simplified, although not in the manner suggested by the comment. It has tried stay relatively true to what is supportable from the underlying working group text.
SPM	17	19	17	27	The relevance of the information contained in this paragraph is limited by the fact that benefits from mitigation are not included in the analysis. Footnote 3 provides an explanation about that, but it should be made very clear in the paragraph itself that costs of mitigation presented here should be considered in balance with the associated reduction of climate damages. [Government of Belgium]	The footnote has been removed. Mitigation costs are relevant in their own right.
SPM	17	19	17	27	Note that we are already at or near 450 ppm-eq. The authors should break up the sentence in middle of paragraph. Change the "percentage points over the century" to "% per year over the century" to ensure that the reader knows that these 0.04 to 0.14 %/yr are to be compared with "1.6% and 3% per year" in the next line/page. [Government of United States of America]	The use of "percentage points" is correct. The information on annualized growth rate reductions has been removed to avoid confusion.
SPM	17	19	17	27	One obvious example of where information could be synthesised across different WG is the issue of costs. This para is a straight copy and paste job from WGIII and really isn't that easy to understand. But most of all, the footnote is insufficient for explaining why a straight comparison between the costs of impacts and the costs of mitigation isn't possible. It is also not easy for a non-specialist to understand and it requires the reader to understand the implications of these statements. The SYR is where all this information should be drawn together and this issue requires a far better, clearer and more explicit explanation. [European Union]	The information on damages from mitigation is insufficient to make this comparison, as discussed in Topic 3.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	19	17	29	This part is very important and valuable in that it describes the economic costs in a reasonable manner. Thus, this part should be maintained as it is. [Government of Japan]	The paragraph remains, but it has been simplified somewhat for clarity.
SPM	17	19	18	7	We think the bolded sentence is not very policy relevant, and we suggest to delete the currently bolded and replace along the lines of : "The costs of mitigation should be considered against avoided damages, co-benefits and adaptation costs to get a good picture of what the net costs (or benefits) are." [Government of Netherlands]	We disagree. It is very important to point out how uncertain estimates of the costs of mitigation are.
SPM	17	19	18	7	This paragraph should contain other information, or "Costs for maintaining concentrations in the range of 530-650 ppm CO2eq are estimated to be roughly one third to two-thirds lower than for associated 430-530 ppm CO2eq scenarios." as described in the page 31 of WG3 TS, because wide range of mitigation cost information is necessary for integrative discussion of the synthesis report. [Hirofumi Kazuno, Japan]	There is insufficient room to address costs of all levels in this section.
SPM	17	19	18	7	This paragraph includes very relevant information for PM. However, it fails to be concise and straight to the point. It is recommended that the paragraph is made shorter whenever it is possible and w/o altering central idea. [Tabaré Arroyo Currás, Mexico]	The paragraph has been simplified.
SPM	17	19	18	7	The following is one comment (placed in several separate rows) and then the suggested additional text for FOD SYR pages SYR-17 - SYR-18 [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario data to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	Comment: [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario data to the database. Furthermore, this level of detail is inappropriate for an SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	19	18	7	According to Annex II of AR5 WGIII (pages 42-47), the 1,184 scenarios in the AR5 WGIII come from 31 models, but 648 of the scenarios (55% of the total scenarios) are from the following 5 models: REMIND (158 scenarios), MESSAGE (140 scenarios), GCAM (139 scenarios), WITCH (132 scenarios), and IMAGE (79 scenarios). [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario dat to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	A statement about the losses in global consumption in a scenario of stabilizing at about 450 ppm CO2eq (page SYR-17 of the First Order Draft of the Synthesis Report dated 21 April 2014) is based on 14 scenarios. Information about the models that achieved this target is not available. If information about the total number of scenarios can be used as an indicator of the stabilization scenarios, there might be a potential bias where the results might be dominated by selected modeling groups. [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario dat to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	Chapter 6 of AR5 WGIII has a section on "Interpretation of model inability to produce particular scenarios" that provides an important discussion about the results where certain scenarios are not reached by the models based on their views of economic development and future technological options. [Sergey Paltsev, United States of America]	Agreed. However, most models in recent scenario exercises can reach 2C goals under the idealized assumptions considered here. The notion of not producing scenarios is now explicitly addressed in Table SPM.2. However, the sentence in the new version that articulates the idealized assumptions needs to say "about technology" as well as "about policy". This needs to be corrected.
SPM	17	19	18	7	The results for the consumption loss in the 450 stabilization are for those models that usually assume relatively cheap low- and no-carbon technologies. Those models that are not able to reach this level of stabilization are simply discarded, while in Section 6.2.4 of AR5 WGIII it is stated that they are "valuable indicators of the challenge associated with achieving particular scenarios." [Sergey Paltsev, United States of America]	See response to comment 1939.
SPM	17	19	18	7	Hence, the table is constructed based on the results heavily weighted by the scenarios provided by a limited number of the relatively low cost models, the results where the models cannot achieve stabilization were discarded, but these important qualifiers (included in Chapter 6) are not provided in the Synthesis Report. Therefore the Synthesis Report gives a misleading summary of the analysis in Chapter 6. [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario dat to the database. Furthermore, this level of detail is inappropriate for an SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	19	18	7	Proposed additional text on page SYR-18: [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario data to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	The results for the consumption loss in the 450ppm CO2eq scenario are based on a limited number of models that are able to reach the target based on their particular views of economic development and future technological options, such as biomass with CO2 capture and storage, that are not proven at large scale. Models with different structures and assumptions, that are not able to reach this level of stabilization, provide valuable information about the challenges associated with achieving particular scenarios {6.2.4} that is not reflected in the table. Therefore, the values for a consumption loss should be treated with caution {6.3.6.2}. [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario data to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	Proposed additional text on page SYR-18: [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario data to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	The results for the consumption loss in the 450ppm CO2eq scenario are based on a limited number of models that are able to reach the target based on their particular views of economic development and future technological options, such as biomass with CO2 capture and storage, that are not proven at large scale. Models with different structures and assumptions, that are not able to reach this level of stabilization, provide valuable information about the challenges associated with achieving particular scenarios {6.2.4} that is not reflected in the table. Therefore, the values for a consumption loss should be treated with caution {6.3.6.2}. [Sergey Paltsev, United States of America]	Although important in some contexts, this observation is less relevant in regards to the cost estimates provided here. The cost estimates in WG3 have been calculated by normalizing to models so that there is relatively equal representation among those that submitted scenario data to the database. Furthermore, this level of detail is inappropriate for an SPM.
SPM	17	19	18	7	Need to say (here and/or in sec 4.4) that the costs of mitigation need to be weighed against the costs of inaction (i.e. the potential cost of the CC impacts avoided by this mitigation. I realise that the costs of inaction are even harder to estimate than the costs of mitigation actions, but the general remark (at a minimum) is still vital in a synthesis report. [Tony Weir, Australia]	Topic 3 addresses this issue.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	19	19	10	Table SPM.1 includes a number of columns relating to "consumption losses". Some of these losses are highlighted in the text on page 17. The methodology for calculating such losses is questionable since it assumes a 'business as usual' baseline in which rising atmospheric concentrations of greenhouse gases create no climate change impacts and therefore do not affect consumption, no matter what level of warming. Such an assumption becomes progressively less tenable as one moves forward in time. By 2100, when 'business as usual' assumes an enormous increase in the consumption of fossil fuels (ie effectively an inexhaustible supply of fossil fuels) which may result in warming of 4 or 5 degC above pre-industrial, the calculated consumption losses are not credible. In addition, the consumption losses fail to take into account the beneficial impacts on consumption of co-benefits from mitigation policy, such as reductions in local air pollution. [Robert Ward, United Kingdom]	Rejected. We explicitly mention in the text that cost estimates do not include the benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation. This has been further clarified in the caption. Table SPM.1 has been revised and split into a Figure for the idealized implementation scenario (Figure SPM.13) and a new more concise Table SPM.2 with information on cost changes in less idealized implementation scenarios.
SPM	17	19			There is a missed synthesis opportunity here. The costs of mitigation in isolation are misleading and should be considered against avoided damages, co-benefits and adaptation costs to get a good picture of what the net costs (or benefits) are. Notions like that often co-benefits are higher than the cost of mitigation should be mentioned here. We suggest to use text from WGII 16.3.2.5. [Government of Netherlands]	Topic 3 makes clear that such an assessment is problematic and it is therefore deemphasized here.
SPM	17	20	17	20	...specification of scenarios..." Is "specification" the right word? Anyway it's a technical phrase [Jonathan Lynn, Switzerland]	The paragraph has been simplified and improved.
SPM	17	21	17	21	To incorporate: They 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]	This is too much detail for the SPM.
SPM	17	21	17	26	Are these losses in consumption estimated in monetary terms? The sentence should state that these estimates are based on a selected set of models. [European Union]	Consumption is measured in monetary terms. The results are from the models for which data was submitted to the AR5 database.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	21	17	27	This is an example of a piece of text that seems to be rather reader unfriendly. While "losses" are referred to in the approved WG3 SPM, the concept of loss seems rather abstract when considered in relation to baseline scenario consumption growth that is stated to be in the range of 300-900%. Perhaps a phrase such as "result in small (or modest?) reductions in global consumption" would communicate the situation more clearly than saying "entail losses in global consumption". Also, suggest breaking this very long complex statement into two parts. First, say that small reductions in consumption are projected under mitigation scenarios relative to consumption under baseline scenarios, which grows 300-900% over the century. Then in a second sentence say what the projected reductions are under the different RCPs. Finally, regarding the part of the phrase that says "not including benefits of reduced climate change as well as co-benefits and adverse side-effects of mitigation...", what are the adverse-side effects of mitigation beyond the loss of consumption which is noted? What are the co-benefits (e.g. pollution, resource efficiency, energy security)? The underlying SYR does not appear to provide any additional details on these. [Government of Canada]	The paragraph has been simplified and improved.
SPM	17	21	17	27	The sentence is too long and very complicated. [Government of Switzerland]	The paragraph has been simplified and improved.
SPM	17	21	18	3	I wonder about the value of including these numbers in the SPM. What this whole paragraph says here is that these numbers are very uncertain, don't really tell much about the true costs of mitigation - especially since co-benefits and avoided costs resulting from avoided impacts are not included - and that other kind of assumptions would deliver very different results. Hence the numbers can be more confusing than informative. Please consider deleting this section on numbers from the SPM (including the Table SPM.1) and instead focus on the headline messages on economics. [Kaisa Kosonen, Finland]	The authors still believe it is important to include some of the numbers to give a sense of the order of magnitude.
SPM	17	21	18	4	This paragraph provides many numbers which are then given in the table on the following page. Suggest to either delete numbers here or to remove them from the table. The table would definitely benefit from a clearer presentation and fewer numbers. [Thomas Stocker/ WGI TSU, Switzerland]	Many of the numbers have now been removed.
SPM	17	21			• SPM [P17 L21] insert Scenarios in which all countries of the world begin mitigation immediately, there is a single global carbon price, and all key technologies are available, have been used as a cost-effective benchmark for estimating macroeconomic mitigation costs. (to make it consistent with WGIII SPM page 17) [Government of Saudi Arabia]	A simpler version of this important caveat has now been included.
SPM	17	21			What does "their specific assumptions" here refers to? [Government of Maldives]	This phrase has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	21			Following the text in page 15 of SPM WG III, it seems that the following text from this paragraph needs to come into line 21 as "their specific assumptions" is referring to the assumptions explained in the sentence. "Scenarios in which all countries of the world begin mitigation immediately, there is a single global carbon price, and all key technologies are available, have been used as a cost-effective benchmark for estimating macroeconomic mitigation costs". [Government of Maldives]	A simpler version of this important caveat has now been included.
SPM	17	22		23	It would be better to talk about 'reductions in global consumption' rather than 'losses in global consumption': 'losses' has a negative connotation. [Government of United Kingdom of Great Britain & Northern Ireland]	The approved WG3 text uses the term consumption losses. Changing this would add confusion.
SPM	17	22			Not convinced that the term "losses" is appropriate in this context. The reductions in consumption are relative to a baseline scenario, which itself is well ahead of current consumption level. Not losses, just less gains. Query whether this is the unusual terminology. It would not be the everyday meaning of the term "loss". [Government of Ireland]	The approved WG3 text uses the term consumption losses. Changing this would add confusion.
SPM	17	23	17	23	The 3 after mitigation should be superscript (refers to the footnote) [Thomas Stocker/ WGI TSU, Switzerland]	The footnote no longer remains
SPM	17	23	17	23	Here is one example of the difficulty in technical language in this report, such that each WG's contributions are written in the language most appropriate for that WG, rather than in a form accessible more widely, which I would think is appropriate for the SYR. Would it be possible to relate Global Consumption to, for example, GDP, which is more widely understood (and is used in Figure 1.6 page 39)? In Googling global consumption, I find definitions for domestic/private consumption but little else. Is that what is referred to? Could the total consumption actually be stated for perspective? [Keith Shine, United Kingdom]	Consumption is widely considered a better indicator, and this is the metric that was used in the WG3 assessment. To move to another indicator would be to remove the link to the underlying report.
SPM	17	23	17	23	"Losses in global consumption", is it possible to convert or use the phrase GDP, a very familiar term than global consumption [Government of India]	Consumption is widely considered a better indicator, and this is the metric that was used in the WG3 assessment. To move to another indicator would be to remove the link to the underlying report.
SPM	17	23	17	23	"global consumption" should have a definition or be more explicitly explained. [Government of United States of America]	This is generally a helpful suggestion, but due to the page constraints authors decided against this. Such a definition is not even in underlying WG summaries.
SPM	17	23	17	24	Could the part 'not including benefits.....side effect of mitigation' be modified into a self-standing sentence after this very long sentence. [Government of Finland]	The sentence has been removed for simplicity. The caveat about not including benefits is now in the underlying table.
SPM	17	24	17	24	Unclear "side-effects of mitigation—of 1% to 4%" [H-Holger Rogner, Austria]	We do not understand the comment.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17	24			Change "mitigation3" to "mitigation. It seems like an error of mistyping. [Government of Republic of Korea]	Accepted
SPM	17	24			The "3" in "mitigation3" should be a superscript since it is a reference to a footnote. [David Wratt, New Zealand]	Accepted
SPM	17	24			The "3" in "mitigation3" should be a superscript since it is a reference to a footnote. [David Wratt, New Zealand]	Accepted
SPM	17	24			footnote 3: This footnote includes very relevant information. However, the SPM should also include some information on the assessment of the climate damages in the case of unabated climate change as well as information on damages of climate change in general. If such information is not available some explanation should be provided on the methodological challenges and therefore on the (current) limitations of CBA in the context of climate change. [Government of Austria]	The footnote has been removed.
SPM	17	26	17	27	This sentences needs to be revised. The previous sentence talks about climate-change related decreases in consumption. Consumption will never decrease (in absolute terms) if its rate growth is positive - even if the rate of growth is decreasing by .04 - 0.14 percent annually. [Government of United States of America]	Sentence has been removed. It was too confusing for an SPM context.
SPM	17	26	18	1	add "amounting to a small delay rather than a loss in growth." (This is the point all the WGIII presentations make) [Jonathan Lynn, Switzerland]	This interpretation could be used, but it has not been used in the underlying working group report and is not appropriate here.
SPM	17	26	18	1	This sentence of "These numbers correspond to an annualized reduction of consumption growth by 0.04 to 0.14 (median: 0.06) percentage points over the century relative to annualized consumption growth in the baseline that is between 1.6% and 3% per year." should be deleted. These small numbers may mislead readers to underestimate the huge amount of economic cost actually needed for the mitigation. [Hirofumi Kazuno, Japan]	Sentence has been removed. It was too confusing for an SPM context.
SPM	17	27	17	27	Footnote 3 : This text can not be found in {3.2}. Suggest to add it there with reference to the underlying assessment report in order to provide the necessary support for the SPM statement. [Thomas Stocker/ WGI TSU, Switzerland]	Footnote has been removed.
SPM	17		21		Costs for mitigation are treated in detail. But there are no costs of climate or climate damages, although this material exists in the WG2 report. Also, how do we compare sensibly costs across mitigation and adaptation? Are the methodologies the same or comparable? Clearly, more investment in mitigation reduces adaptation costs, so there is a relationship between the two. These issues could be usefully discussed. [Government of India]	We compare risks of mitigation, adaptation and residual climate change. This is a broader approach. Climate damage estimates are included in the underlying report.
SPM	17				Right panel: 2010 text should be to the right of the horizontal red line in order to make it clearer that the red line is the 2010 value. [Government of Netherlands]	Noted. We have redesigned the entire figure.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	17				No need for two legends since colour-coding is identical between the three panels. [Government of Netherlands]	Accepted. Removed one legend.
SPM	17				Middle panel, First (gray) column shows rate of change for 1900-2010. It is unclear what the 2000-2010 text refers to. Is it the wider bit in the middle of the column? This should be clearer. [Government of Netherlands]	Noted. We have simplified the middle panel. The explanation in the caption clearly explains what this is.
SPM	17				Figure SPM.8 (left panel): What do the black whiskers (on the 2010 emissions) illustrate? The uncertainty of the 2010 emissions level cannot be that large? Please consider explaining in the figure caption. [Government of Norway]	Rejected. This represents the uncertainty in emissions. It is consistent with the historic emission assessment. The uncertainties appear large as the y-axis only reports from 20GtCO ₂ eq upwards.
SPM	17				Figure SPM.8. We appreciate this very important figure, but in its current form it is too hard to understand, please consider to make it easier. [Government of Norway]	Accepted. We have generated a simplified version of this figure.
SPM	17				Figure SPM 8. The key labels at the middle of the two figures is very faint. Consider increasing the font size or making them bold [Government of Kenya]	This is an approved figure, but we have simplified it now for the purposes of the synthesis report.
SPM	17				It is missing a definition on 'climate damages' or 'ecosystem impacts' [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	We do not discuss climate damages at length in the SPM, but reserved an entire box for it in the underlying report, where the concept is covered in detail.
SPM	17				Figure SPM.8. The resolution of the text is poor. Some of the text can hardly distinguishable. Besides, the Figure is too complicated for a quick grasp of the information contained. The information in the right panel is difficult to understand. 'Emission levels of 'low-carbon energy upscaling' needs to be explained. [Government of Switzerland]	Accepted. We have generated a simplified version of this figure.
SPM	17				figure SPM.8: It is suggested to delete the right panel as it does not add a lot of information. [Government of Austria]	Rejected. The right panel contains important information. We have simplified the figure to make it easier to grasp for the reader.
SPM	17				figure SPM.8: It is suggested to explain in the caption the significant uncertainty indicated in the left panel for the emission level in 2010. [Government of Austria]	Rejected. This is explained in Section 1 of the SPM on emission trends and drivers. We do not need to do this here again.
SPM	17				Figure SPM.8 In the middle panel, there is a single bar showing the historical annual rate of change in CO ₂ emissions. This bar is for the period 2000-2010. The text above the bar 'History 1900-2010' is confusing since there is no other bar covering the period 1900-2000. This text could be deleted or another bar added for a second time period (e.g. 1970-2000, as in Figure SPM-3). [Government of France]	Noted. We have simplified the middle panel. The explanation in the caption is sufficient.
SPM	17				Figure SPM.8 again a very loaded figure, difficult to follow for non-specialists. It would benefit from simplification for the SPM. [Government of France]	Accepted. We have generated a simplified version of this figure.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	18	1	18	3	We believe this statement is very important, and should be strengthened. Please consider to exemplify by including numbers from the orange segment in Table SPM.1. [Government of Norway]	Rejected. Due to space constraints it is most efficient to have a general statement and make a reference to the table.
SPM	18	1	18	26	What is the measure of mitigation costs here? Investment? Changes in GDP? And how does this relate to the losses in consumption. [European Union]	We measure mitigation costs as "reductions in consumptions relative to baseline (%)". Consumption losses are a well accepted cost measure - similar to GDP losses. The WG3 chapter 6 reports multiple cost metrics.
SPM	18	4	18	7	We would suggest that the following sentence starts as a new para and is put in bold as it is quite obviously one of the main points in this section: "Mitigation scenarios reaching about 450 or 500ppm CO2eq by 2100 show reduced costs for achieving air quality and energy security objectives, with significant co-benefits for human health, eco-system impacts, and sufficiency of resources and resilience of the energy system;" [Government of Denmark]	This sentence has been removed from the SPM.
SPM	18	4	18	7	This sentence comes from {3.5} (SYR page 86 lines 47-50) and in the chapter it has a medium confidence statement, so we assume medium confidence should be added here to be fully consistent. [Thomas Stocker/ WGI TSU, Switzerland]	This sentence has been removed from the SPM.
SPM	18	4	18	7	{3.5} should be added to the line of cite (see previous comment) [Thomas Stocker/ WGI TSU, Switzerland]	This sentence has been removed from the SPM.
SPM	18	4			• SPM [P18 L4] insert 'Many models could not achieve atmospheric concentration levels of about 450 ppm CO2eq by 2100 if additional mitigation is considerably delayed or under limited availability of key technologies, such as bioenergy, CCS, and their combination (BECCS). (from WGIII page 17) [Government of Saudi Arabia]	Accepted. We have added such a sentence and added colour coding to the new Table SPM.2 to make transparent which share of attempted scenarios could meet a particular target.
SPM	18	5	18	5	Wich are the objectives of the energy security? In the SPM report of WG-III Venezuela was the country that critizice the overuse of energy security in the report. In relation with this word in the glossary the authors didn't accept to review, but Venezuela recorded in plenary that is not agreed with the definition in the glossary. [Government of Venezuela]	This sentence has been removed from the SPM.
SPM	18	6	18	6	The word "impacts" should probably apply to both human health and ecosystems or to none of these (we know that this is copy-paste from WGIII SPM, but still...) [Government of Belgium]	This sentence has been removed from the SPM.
SPM	18	7	18	7	The last sentence repeats what is stated earlier in line 23. if need be, put it as a footnote here. [Government of United States of America]	This sentence has been removed from the SPM.
SPM	19	0	19	0	last 4 rows of table: for clarity, put the brackets and their numbers on a new line (as was done with "[N: 14]") [Government of Netherlands]	We have revised the table substantially.
SPM	19	1	19	9	Table SPM.1 A metric of the number of years by which the same GDP would be achieved in 2050 should be added. [Government of South Africa]	Rejected. Such information is not available in the WG3 report, but we show reductions in annualised growth rates in the new Figure SPM.1

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	19	1	19	9	Table SPM1: Explanation of baseline (year) is missing, thus making it hard to understand. Similarly, default technology assumptions (year?), immediate mitigation of year is missing. [Government of Hungary]	Rejected. There is no single baseline year. Where required reference years are shown in that table.
SPM	19	1	19	10	Can content,captions and footnotes be integtraed into a clear statement on these data? [Government of Ireland]	We have completely revised the Table.
SPM	19	1	19	10	The mitigation cost curve bends the wrong way due to selection bias. This is in the SPM of the WG3 report, but it contradicts the literature. The first and second partial derivatives should both be positive. [Richard Tol, United Kingdom]	We have revised the table and address selection bias by more carefully highlighting the share of models, which could successfully run a particular scenario. We also controlled for the bias that results from some a much larger number of scenarios from some models than for others
SPM	19	1	19	10	Including specific numbers in table 1 is inconsistent with the stated uncertainty of the reliability of the models from which the numbers were produced. The authors should consider using relative costs. This would also make the table much easier to understand. [Government of United States of America]	Rejected. This table shows relative costs, these are consumption losses relative to baseline (in %).
SPM	19	1	19	10	The use of brackets and parentheses in Table SPM.1 is inconsistent and confusing. Units, percentile ranges, and number of scenarios all use these interchangeably. In addition, the font may result in confusing the brackets and the numeral "1" (one) (e.g., 1% reduction in consumption...).. [Government of United States of America]	Accepted. We have revised the entire table and cleaned it up in this context.
SPM	19	1	19	10	Table SPM.1: This table is too complicated for the SPM. The title does not reflect the content and there are way too many notes. Need to simplify (middle orange columns may be removed). [European Union]	Accepted. We have turned the Table into a Figure and a smaller Table. This makes the information much easier to digest.
SPM	19	1	20	12	<Table SPM.1> The description in the 1st point of Notes should be revised to explain that most models assume an upper limit for nuclear energy in the models' default technology assumption from the standpoint of public acceptance. This is the reason why mitigation cost does not increase so much in the scenario of "Nuclear phase out". [Hirofumi Kazuno, Japan]	Rejected. This is not the default assumptions in most models. IPCC WG3 chapter 7 shows scenarios with extremely high shares of nuclear electricity.
SPM	19	1			what is the unit? [Joanna House, United Kingdom of Great Britain & Northern Ireland]	This was explained in the table caption, but have made the information more prominent for the readers' ease.
SPM	19	1			This table is complex, it requires significant studying, the messages are not very clear. Does it belong to an SPM ? If so, consider simplifying. [Government of Belgium]	This Table summarizes some of the most important and recent findings in the literature. We have turned the Table into a Figure and a smaller Table. This makes the information much easier to digest.
SPM	19	5	19	5	"technology is constrained" by what? What does this mean? [Government of United States of America]	Accepted. We have reworded to "limited availability of specific technologies".

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	19	5	19	5	The selected, annualized interest rate of 5% is problematic. With respect to discounting based on an intergenerational method, it can be argued that ethically there should be no preference between the value of a benefit (or cost) now and the same benefit (or cost) in the future after allowing for the expected probability of the extinction of human beings (i.e., this is the only fair determinate of "preference for the present"), such that an appropriate, intergenerational discount rate might be about 0.1 percent per annum. [Carl Southwell, United States of America]	This is a relative cost measure where the discount rate does not influence the results strongly. There is a long discussion on discounting in chapter 3 of the WG3 report, where the various arguments are reviewed - also from an ethical perspective. There is no space to do so here.
SPM	19	6	19	6	The text here suggests that there will also be figures in the table on the increases in costs when delaying through 2020 - but in the table there are no figures for dealing through 2020. It would indeed be extremely useful and relevant to also have figures for costs of dealing through 2020. [Government of Denmark]	Rejected. The text does not say anything about delaying mitigation through 2020.
SPM	19	7	19	7	It would be very useful with an explanation of why 55 Gt is chosen as the dividing line here - is 55 for example the baseline for 2030? [Government of Denmark]	Rejected. This is approved SPM material. But as can be seen in SPM.8, this group of scenarios contains those ones, where emissions continue to rise steeply through 2030.
SPM	19	9	19	9	(Table 3.2) should be written between braces {} [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.
SPM	19	9			Typographical error in Table: top of blue column, "due delayed" should be "due to delayed". [Government of Canada]	Accepted.
SPM	19	10	19	10	Table : blue part : " $\leq 55\text{GtCO}_2$ " in bold font, the rest of the line " 2eq " not, " $>55\text{GtCO}_2\text{eq}$ " not in bold [Thomas Stocker/ WGI TSU, Switzerland]	Accepted. Copy-edited the revised version of the table.
SPM	19		19		"costs due delayed additional mitigation" in Table SPM. 1 should be changed to "costs due to delayed additional mitigation". [Keigo Akimoto, Japan]	Accepted.
SPM	19				Table : orange section : CCS should be explained (in caption or in note 3, line 6 page 20) [Thomas Stocker/ WGI TSU, Switzerland]	CCS is explained before in the text.
SPM	19				Table SPM.1. In the current version of the table (orange segment) it is not evident if BECCS is included in either "No CCS" or "limited bioenergy" columns. Please consider to make this more clear since BECCS seems to be such an important factor in mitigation scenarios that reach the 2 degree goal. If it is not included in the current version you should consider to make a new column that shows the percentage increase in mitigation costs if BECCS is not available. [Government of Norway]	Rejected. This is clear. When any of these technologies is constrained, BECCS is constrained.
SPM	19				Table SPM.1: 'reduce climate change' to 'reduce carbon emission' [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	The benefits come from reduced climate change.
SPM	19				Table SPM.1 is very complex and should be removed. The key messages should instead be stated in the text with a reference to the table in the SYR. [Government of United Kingdom of Great Britain & Northern Ireland]	We have turned the Table into a Figure and a smaller Table. This makes the information much easier to digest.
SPM	20	1	20	20	Table SPM1 I'm not sure which is bright green. Suggest to use dark green and light green. [Rachel Warren, United Kingdom]	We have changed the Table in the meantime. This colour coding no longer exists.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	20	2	20	3	if possible please specify "additional limitations"? Otherwise a general statement would be enough, currently too opaque [Government of Netherlands]	Rejected. We believe that this is sufficiently clear. Approved language.
SPM	20	16	20	16	To include at the end of the sentence: It is important to consider the holistic views of indigenous peoples's about environment and community. [Government of Bolivia]	Rejected. We only use approved text for this table and should not add additional information.
SPM	21	1	21	1	What is meant by adaptation "pathways"? The following text suggests options, planning, capacity and other elements, but not pathways in the sense of mitigation (emissions trajectories). Do you mean "development pathways" that enable better adaptation? If so, development paths should be clearly integrated into title and text. Otherwise, reconsider the title of 3.2 [Government of South Africa]	This is explained in the Topic 3 Introduction
SPM	21	1	21	42	Section 3.2: This section portrays adaptation only as very complex and challenging (which is true in many cases, but not all). Suggest reviewing the way adaptation is characterized here to improve relevance of overall takeaway messages. [Government of Canada]	The text tries to strike a balance of direct actions as well as emphasizing some of the challenges.
SPM	21	1	21	42	The text in these sections should be rearranged to improve the logical flow. [Government of Switzerland]	The text has been re-arranged.
SPM	21	1	21	42	The previous section is 'Mitigation pathways' . The text on 'Adaptation pathways ' does not seem to flow with a comparable logic. A more suitable title should be considered or the content be reconsidered to better reflect the title. A good starter for the section with the existing title (suggestion to the key messages) is the sentence on lines 18-20: Effective adaptation strategies are fundamentally related to what the world accomplishes with climate change mitigation. Since the figure SPM 9 is not presented until on page 22, it is relatively hard for the reader to get the big picture of adaptation paths and issues related to thresholds etc which are referred to in section 3.2. Some reference back to Figure SPM 7 on future key risks and potential for risk reduction (page 14) could also be helpful for the reader. [Government of Finland]	The title has been fixed for quite some time. The intent with this section is to provide a strategic base for the adaptation actions covered in 4.2
SPM	21	1	21	42	an introduction to adaptation strategy examples would enable the reader to understand and put this in context. For example in the building sector - buildings can be made adaptable by including shading, mass, natural ventilation passive strategies to help mitigate the effects of overheating. Agriculture can start introducing more drought tolerant species. [Jason Fitzsimmonz, England]	This material is covered in section 4.2
SPM	21	1	22	1	Both pathways, adaptation and mitigation, should have the same treatment. If there is maladaptation, mitigation has also limits. [Government of Venezuela]	There has been effort to maintain consistency.
SPM	21	1	27	12	Adaptation co-benefits need to be given due priority [Government of India]	There is a cross-reference in the body of Topic 3.3 addressing co-benefits

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	1	27	12	Mention about mainstreaming adaptation [Government of India]	Integration of adaptation strategies and actions into development planning and decision-making is discussed in section 4.3 of the SPM.
SPM	21	1	27	12	Most of Sections 3.2-4.4 read like an academic text book and belong in the underlying report and Topics, but not in the SPM. The SPM should focus on statements that can be quantified. [European Union]	Many of the statements come from approved SPM material - this is a synthesis of those and other material. The section has been shortened considerably and hopefully this will address this comment.
SPM	21	3	21	3	We propose to insert the word "and taking advantage of the opportunities" after damages [Government of United Republic of Tanzania]	That sentence has been removed
SPM	21	3	21	3	"Adaptation is essential for reducing...": insert "avoiding and" before "reducing" [Government of Hungary]	That sentence has been removed
SPM	21	3	21	4	Should be added lost and damage [Government of Ecuador]	That sentence has been removed
SPM	21	3	21	5	To emphasise effective adaptation, we suggest that the second sentence start "To be effective, adaptation options and their ..." [Government of New Zealand]	That sentence has been removed
SPM	21	3	21	5	The opening sentence of the boxed finding summary at the top of page 21, should be consistent with the similar statements throughout the SPM and the individual chapters of the Synthesis Report and supporting IPCC Chapters. Specifically, "Adaptation options and their potential benefits are context-specific, and depend on the rate and amount of climate change experienced AS WELL AS THE ADAPTIVE CAPACITY OF THE PLACE, SECTOR, RESOURCES IN QUESTION. Based on the individual chapters in WGII, it's important to reflect our growing understanding of the importance of understanding vulnerability as risks, sensitivity and ability to respond especially as IPCC and the UNFCCC moves more aggressively into adaptation as a complement to mitigation. [Government of United States of America]	These are good points but the text addressing them has been removed to shorten the SYR SPM
SPM	21	3	21	8	Boxed text doesn't quite capture the paragraphs that follow. We suggest to delete it. [Government of Netherlands]	The headline statement has been shortened and the text changed. There is a need to have a headline statement for consistency with other sections.
SPM	21	3	21	8	Some more context on the importance of adaptation is needed here. Please highlight the point that we are committed to further warming and adaptation is the only option to reduce these impacts. But also required to manage long-term risks that can not be avoided by mitigation [Government of United Kingdom of Great Britain & Northern Ireland]	This is a good point but the restricted nature of the SPM means that this discussion is undertaken in the Topic 3 text.
SPM	21	3	21	8	Recommend including mention of "adaptive capacity" of the sector/region/resource in question - recommend more context here in general from WGII (chapters 14-17). [Government of United States of America]	These are good points but the text addressing them has been removed to shorten the SYR SPM

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	3	21	8	The highlighted text about adaptation does not provide clear messages; this is a complex and messy box, where everything appears to be relative, and as such is very difficult to draw conclusions. [European Union]	The headline statement has been shortened.
SPM	21	3			The wording "Adaptation is essential for reducing damages ..." appears policy prescriptive. I suggest: "Adaptation can substantially reduce ..." [David Wratt, New Zealand]	The sentence has been removed.
SPM	21	4	21	5	The definition of "rate and amount" of climate change experienced is somewhat vague and confusing. It may be worth revising the use of terminology and explain this concept more clearly... [Government of United Kingdom of Great Britain & Northern Ireland]	That sentence has been removed
SPM	21	5	21	6	Should be added social-economic contexts [Government of Ecuador]	That sentence has been removed
SPM	21	5	21	8	Please split/reformulate the sentence to improve readability. [Government of Finland]	That sentence has been removed.
SPM	21	5	21	8	"Recognizing... underpins..." seems normative, very prescriptive in telling us what to 'recognize' - how about "can help" instead. [Government of United States of America]	That sentence has been removed
SPM	21	5	21	8	This sentence is hard to understand and repetitive to a sentence on lines 13-14. Please reword. One suggestion could be: "Effective selection and implementation of adaptation options and the pursuit of climate resilient pathways require the building of adaptive capacity at many levels, recognizing diverse circumstances and social-cultural contexts." [Government of United States of America]	That sentence has been removed and adaptive capacity is dealt with in section 4.5
SPM	21	5	21	8	The following wording is suggested: Effective selection and implementation of adaptation options and the pursuit of climate-resilient pathways is characterized by recognizing diverse interests, circumstances, social-cultural contexts, and expectations, as well as building adaptive capacity at all levels. [Government of Austria]	That sentence has been removed.
SPM	21	5			climate change experienced' to 'climate changes impacts experienced' [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	That sentence has been removed.
SPM	21	10	21	10	This first sentence could be strengthened - e.g. "Adaptation can bring both immediate and long-term benefits, contributing to the wellbeing of current and future generations" [Government of United Kingdom of Great Britain & Northern Ireland]	That sentence has been modified to: Adaptation can contribute to the wellbeing of populations, the security of assets, and the maintenance of ecosystem services now and in the future
SPM	21	10	21	10	Please, consider adding from WG2 SPM the following sentence: A first step towards adaptation of future climate change is reduced vulnerability.... (The second full paragraph after the title C-1 Principles for Effective Adaptation). A possible place for this could be as the second, new sentence of the SYR para starting on line 10. [Government of Finland]	That sentence from the SPM has been included.
SPM	21	10	21	11	This bold sentence does not relate well to the rest of the paragraph, which is about adaptation planning. Consider revising or beginning the paragraph with the second sentence. [Government of Canada]	Both the headline and text have been extensively changed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	10	21	16	The term "effective engagement with stakeholders" is too broad without specifying the important practices that may fall under this phrase. I am particularly pointing out to communicating the outcome of climate change with local people and also providing info about the risks and vulnerabilities of the local communities. [Vahid Mojtahed, Italy]	That sentence has been removed.
SPM	21	10	21	42	The text as written is too vague. Please be more specific or eliminate. [Government of United States of America]	The text has been extensively modified.
SPM	21	11	21	11	environmental functions and ecosystem services [Government of Bolivia]	Not included due to space restrictions.
SPM	21	11	21	12	Should be added territorial management [Government of Ecuador]	Not included due to space restrictions.
SPM	21	11	21	16	This paragraph is very generic and must have been stated in many previous IPCC reports [Government of India]	It is a synthesis of material in the AR5.
SPM	21	12	21	16	The authors should consider deleting these two paragraphs as they provide little value and the adaptation and mitigation sections of this report could be condensed and simplified. [Government of United States of America]	There has been substantial shortening of the text..
SPM	21	13	21	14	Should be added social-economic contexts [Government of Ecuador]	Not included due to space restrictions.
SPM	21	13			The text here just repeats the headline in the paragraph. Consider deleting [Government of United States of America]	Text and headline editing has occurred.
SPM	21	14	21	14	After processes to include: towards promoting adaptation for sustainable development, including poverty reduction [Government of Bolivia]	Sustainable development included in paragraph 3.
SPM	21	14	21	16	This sentence is very jargon-filled. It is not clear what message is trying to be conveyed. Suggest simplifying. [Government of Canada]	The text has been shortened.
SPM	21	18	21	18	Editorial: To increase readability for this very long sentence please consider to insert a comma before "but such strategies". [Government of Norway]	The text has been shortened.
SPM	21	18	21	19	Do 'such strategies' (line 24/25) and 'they' (lines 25 and 26) refer to 'effective adaptation strategies' or to effective adaptation strategies that have been linked to sustainable development? [Government of Netherlands]	The text has been removed.
SPM	21	18	21	19	The phrase "are challenging to implement" prejudices what the future may be. A more appropriate wording may be "have been difficult to implement". [Government of United States of America]	Text has been removed.
SPM	21	18	21	20	Should be added after "mitigation" and development [Government of Ecuador]	The text has been removed.
SPM	21	18	21	20	This sentence needs editing to increase clarity and avoid misinterpretations by the reader that all "effective adaptation strategies" are "difficult to implement". One suggestion: "While adaptation can link with sustainable development to reduce vulnerability, the success of such efforts will be fundamentally related to what the world accomplishes on climate change mitigation." Suggest also that a confidence statement may not be needed here, since this is a statement of fact. [Government of Canada]	The text has been removed.
SPM	21	18	21	20	This language is vague and difficult to understand. Please clarify [Government of United States of America]	The text has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	18	21	22	The effectiveness of adaptation strategies is uncertain due to various types of uncertainties. The author correctly pointed out that decision support process should be equipped with tools that address uncertainty. It is more appropriate to use the word robustness for describing the adaptation strategies pointing to the fact that an adaptation strategy that is effective in only one future scenario is no good and effectiveness should be combined with robustness to reflect the fact that adaptation strategies are uncertain and it is important to look for strategies that perform well in a wide range of feasible future states of world. Maybe adding an additional paragraph is better to explain this point rather than modifying the current paragraph. [Vahid Mojtahed, Italy]	This text and point has been moved to section 4.2
SPM	21	18	21	22	This paragraph is not very enlightening as written. It implies that linking adaptation with sustainable development is not fruitful, but the literature from this assessment doesn't come to that conclusion. Also, "what the world accomplishes" is awkward phrasing. The last sentence seems entirely disconnected from the first. [Government of United States of America]	The text has been removed.
SPM	21	20			Unclear what "They" refers to [Government of Sweden]	The text has been removed.
SPM	21	20			the developing countries require more effort and financial support to adaptation, and needs expected adaptations increase; therefore, there must be a balance with required mitigation and redirecting financial resources for adaptation. [Government of Nicaragua]	This interaction between mitigation and adaptation is now in Section 3.2
SPM	21	22			• Section 3.2 SPM [P21 L22] Re insert 'There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Mitigation policy could devalue fossil fuel assets and reduce revenues for fossil fuel exporters, but differences between regions and fuels exist (high confidence). Most mitigation scenarios are associated with reduced revenues from coal and oil trade for major exporters (high confidence). The effect of mitigation on natural gas export revenues is more uncertain, with some studies showing possible benefits for export revenues in the medium term until about 2050 (medium confidence). The availability of CCS would reduce the adverse effect of mitigation on the value of fossil fuel assets (medium confidence). (From WGIII page 20: these are concrete illustrations of how mitigation could make adaptation even more challenging. [Government of Saudi Arabia]	These are good points but the text addressing them is in other sections such as 3.2
SPM	21	24	21	28	It's not clear what distinguishes the impacts at 4degC from temperature changes below 4degC. Wouldn't there also be a risk of damage to agricultural production and ecosystems below 4degC? Also, 4degC isn't a threshold so it would be better to say "a temperature rise of around 4degC and above". [European Union]	The text has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	24	21	29	risk with increasing temperature 2 ° Should be included [Government of Ecuador]	The text has been removed.
SPM	21	24	21	29	This section is about adaptation whereas the text in the supporting lines here are about impacts for global warming of >4degC. Suggest this paragraph be revised to focus on adaptation challenges or else delete this paragraph and rework the message that adaptation becomes more challenging at higher magnitudes of warming into the next paragraph on limits to adaptation. Recommend removing the references to tipping points; however, if this remains, examples may be needed to help the reader understand. [Government of Canada]	The text has been removed.
SPM	21	24	21	30	Although WGII has exemplified climate change impacts for two distinct temperature levels, risks change successively with temperature change (cf. for example with the RfC presentation). This would be useful to express more clearly, so that one does not get an impression of stepwise character of changes. Here, for example, it is implied that only a temperature rise above 4oC would risk crossing tipping points. Such risks increase with warming, which is sort of mentioned towards the end of the paragraph (but without being clear whether this applies to lower levels of warming than 4oC). [Government of Sweden]	The text has been removed.
SPM	21	24	21	30	This paragraph doesn't come from {3.3} as suggested by the line of cite but from {3.4}. Moreover, this topic is already discussed in previous section of the SPM, therefore it could perhaps be removed here to shorten the SPM text [Thomas Stocker/ WGI TSU, Switzerland]	The text has been removed.
SPM	21	24	21	30	Strong overlap with 13:27-36 [Keith Shine, United Kingdom]	The text has been removed.
SPM	21	24	21	30	this laregely repeats the imapcts statements made earlier, only the headline message is specific to adaptation. I would suggest to put this headline at the top of the following paragraph, that then at least goes in to some adpatation specifics [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The text has been removed.
SPM	21	24	21	30	This section is repetitive with p. 13 lines 27-36 and can, therefore, be deleted. [Government of United States of America]	The text has been removed.
SPM	21	24	21	30	These lines seem out of place in the discussion. Mabye they are better placed at the end of this section? [Government of United States of America]	The text has been removed.
SPM	21	24	21	30	Repeats text of page 13, lines 27-36 (which is better). Suggest rephrasing by highlighting adaptation pathways to the likelihood of severe impacts without repeating the impacts from Section 2. [H-Holger Rogner, Austria]	The text has been removed.
SPM	21	24	21	30	There are some contradiction in the paragraph. A temperature rize above 4C It would also risk crossing tipping-pointscontradicting with the statement Precisely how much climate change would trigger tipping-points remain uncertain [Government of United Republic of Tanzania]	The text has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	24	21	36	Bold headlines are more similar than the text they summarize. If one only reads the headlines the impression is that they say the same thing. [Helmut Haberl, Austria]	The text has been modified
SPM	21	25	21	25	Which time frame does this refer to? 4C from pre-industrial? [Government of United States of America]	The text has been removed.
SPM	21	25	21	25	Clarify that this is 4°C above pre-industrial. [European Union]	The text has been removed.
SPM	21	25	21	25	It is suggested to insert "above pre-industrial level" after "4oC" in order to clarify the temperature change that has been addressed by the assessment. [Government of Austria]	The text has been removed.
SPM	21	25	21	26	Please consider to start this sentence with a short descriptive text e.g. "The risks of climate changes increases with rising temperatures, and a temperature rise above 4°C will greatly increase the risk of damaging....." Rationale: In the current draft it could be misinterpreted so that only temperatures above 4°C implies high risks. [Government of Norway]	The text has been removed.
SPM	21	25	21	29	The risk of damage for agricultural production, ecosystems and species start with much lower levels of warming than 4 degrees. [Kaisa Kosonen, Finland]	The text has been removed.
SPM	21	25			The statement starting with "A temperature rise above 4°C..." is rather weak compared to the statement on risks associated with 4°C on P13 L 28-33 (the latter one is based on WG2 SPM, second last paragraph in part B.1). It also gives the wrong impression that high risks are only to be expected above 4°C. Furthermore, the statement conveys the message that tipping points might only be triggered above 4°C. Here again the wording on P 13 L 33 is much more precise. Lastly, replace "with increasing greenhouse gas emissions" with "with increasing global mean temperatures". Reason: Otherwise, the reader could assume that constant emissions would not lead to increased risks. Please improve the statement, also avoiding duplication of the information given on P 13. [Government of Germany]	The text has been removed.
SPM	21	25			Please specify the baseline for the "above 4°C" statement - e.g. "A temperature rise above 4°C COMPARED TO PRE-INDUSTRIAL ...". [David Wratt, New Zealand]	The text has been removed.
SPM	21	26	21	26	To include (in red): production, environmental functions and ecosystems worldwide, [Government of Bolivia]	The text has been removed.
SPM	21	26	21	27	"It would also risk crossing tipping-points that could lead to disproportionately large responses in the earth system (low confidence)." This is an extremely vague statement, and with the low confidence attached, it's significance to the paragraph is called into question. It is suggested to either clarify what is meant or remove this sentence altogether. [Government of Germany]	The text has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	26	21	28	" It would also risk crossing tipping-points that could lead to disproportionately large responses in the earth system. (low confidence)" This statement is insufficiently clear: The confidence level is not given in SYR. It sounds like there was a low confidence that there is a risk to cross tipping points which leads to responses in the earth system; however, the "low confidence" is attributed to "the temperature changes at which thresholds might exist" (WGII, 19.5.1). However, this exact formulation is also found in the SPM of WGII (p.7, l. 24). [Government of Netherlands]	The text has been removed.
SPM	21	26	21	28	The vague nature of the statement coupled with the low confidence associated with it raises the question as to whether this statement should be included in the SPM. [Government of United States of America]	The text has been removed.
SPM	21	26	21	29	Looks a lot a repetition of SPM 13 Line no. 34-36 of this document [Government of India]	The text has been removed.
SPM	21	27	21	27	"Tipping points". Is it possible to give some examples or a footnote on tipping points [Government of India]	The text has been removed.
SPM	21	27	21	27	We suggest changing "would also risk" to "could also risk" to better reflect the low confidence in the statement. [Government of United States of America]	The text has been removed.
SPM	21	27			Tipping points are not only relevant at the global scale, as this language suggests [Government of Sweden]	The text has been removed.
SPM	21	27			I don't think policy-makers know what tipping-points are. [Government of Sweden]	The text has been removed.
SPM	21	28	21	29	"but the likelihood of crossing them increases with increasing greenhouse gas emissions (medium confidence)" matches with the SYR, however, the original phrasing in WGII, 19.7.3 is "Reducing greenhouse gas emissions is projected to reduce the risks of triggering such transitions [medium confidence]. "we think in a field where nonlinear responses are as likely as in the climate system, one should not assume a linear response if it is not stated, so we suggest to stick with the original phrasing in WG II 19.7.3. [Government of Netherlands]	The text has been removed.
SPM	21	28	21	30	In Page 13 lines 33-36 same idea was stated. Therefore, it is suggested that for simplicity, the phrase "Precisely how much climate change would trigger tipping-points remains uncertain, but the likelihood of crossing them increases with increasing greenhouse gas emissions (medium confidence)" is removed to avoid repetition. [Tabaré Arroyo Currás, Mexico]	The text has been removed.
SPM	21	29	21	29	Is the intention here 'emissions' or 'concentrations'? [Government of United States of America]	The text has been removed.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	29	21	29	It is suggested to use the following wording for the last part of the sentence: ..., but the likelihood of crossing them increases with increasing greenhouse gas concentrations. This change in wording seems very important because climate change/temperature change is only directly related with concentrations of greenhouse gases but not with the rate of greenhouse gas emissions. Even if GHG emissions are being reduced compared to today's level but continue finally such dangerous levels of concentrations will be reached, albeit at a later point in time. [Government of Austria]	The text has been removed.
SPM	21	32	21	32	The statement "There are limits to adaptation;" goes beyond what was agreed to in the WGII Summary for Policymakers. The authors should consider deleting this sentence. [Government of United States of America]	This is approved SPM text.
SPM	21	32	21	33	This statement adds no value and can be deleted. [Government of United States of America]	This is approved SPM text and is an important point.
SPM	21	32	21	36	This paragraph contains two important but unrelated concepts- limits to adaptation and maladaptation. In the current formulation the bold text is not supported by the non-bold text. Suggest reviewing and revising. [Government of Canada]	The text around the maladaptation reference has been changed to hopefully convey that the points appropriately.
SPM	21	32	21	36	Please delete the first sentence "There are limits to adaptation;" Without context this notion seems to be too normative, top-down and prescriptive. According to the WG2-approach, context specificity and transformational adaptation imply a wider scope of possible actions, each facing specific limits (see also comments below). [Government of Germany]	This is approved SPM text and is an important point.
SPM	21	32	21	36	Can you turn this statement on limits of adaptation around so that it is a more informative statement of exactly what this means for today. E.g. it means that (1) we need mitigation and (2) we need to start adapting early to ensure we can adapt well. [Government of United Kingdom of Great Britain & Northern Ireland]	The point here is that adaptation cannot be assumed to be able to offset all impacts and greater levels of climate change are more likely to exceed these limits and thus increase residual damages.
SPM	21	32		33	RETAIN: "There are limits to adaptation; greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits (high confidence)." ADD: Emergency. [Peter Carter, Canada]	Thanks, we agree that this is an important point. We have retained this sentence

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	32		36	<p>Please reformulate:</p> <p>There are limits to adaptation; greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits(high confidence).</p> <p>To:</p> <p>There are limits to adaptation and adverse impacts remain for all levels of mitigation and adaptation; greater rates and magnitude of climate change increase the likelihood of exceeding adaptation limits (high confidence).</p> <p>[Carl-Friedrich Schleussner, Germany]</p>	This is approved SPM text and we prefer to not adjust in this case as there have been a wide range of views expressed about it.
SPM	21	32			<p>Suggest adding a footnote after the phrase "limits to adaptation" that captures the following text from the WGII SPM "Limits to adaptation occur when adaptive actions to avoid intolerable risks for an actor's objectives or for the needs of a system are not possible or are not currently available. Value-based judgments of what constitutes an intolerable risk may differ." Ensure that "Adaptation Limits" and "Maladaptation" are included in the SYR Glossary. [Government of Canada]</p>	This is a good point. This text was in an earlier draft but has been removed due to space considerations.
SPM	21	33	21	33	<p>Editorial: Add space after "limits". [Government of Norway]</p>	Thanks. Done.
SPM	21	34	21	34	<p>It is suggested to insert "of climate change" after "anticipate consequences". Otherwise the statement lacks clarity. [Government of Austria]</p>	This refers to not anticipating fully the consequences of the adaptation(which may be too much, too little, poorly directed etc). Due to space constraints it is difficult to add explanatory text
SPM	21	38	21	38	<p>As it is formulated inthe current draft it sounds like transformation is only about adaptation. Please consider to rephrase to "Restricting adaptation and mitigation responses to...". [Government of Norway]</p>	This topic is about adaptation. The linkage with mitigation is covered in 3.2 and in the Topic 3 Introduction.
SPM	21	38	21	39	<p>The use of "miss out" implies the comment is being made from the perspective of some entity or other, but there is none mentioned in the sentence. Suggest rewording: "Restricting adaptation responses ..., may increase costs and losses, and result in missed opportunities." [Government of New Zealand]</p>	Due to pace considerations, this otherwise useful edit has not been implemented.
SPM	21	38	21	39	<p>This statement could be rephrased in a manner that maintains the idea but presents it in a less negative manner. Perhaps along lines of "Considering transformational change in adaptation planning could help reduce costs and losses, and increase opportunities." Suggest also adding some words to the end of the sentence to clarify the opportunities for what (e.g., enhancing resilience, economic development, etc.). This should link to the supporting sentence which talks about introduction of new technologies, etc. [Government of Canada]</p>	This is helpful, however, the sentence is structured this way because studies have shown the tendency is to focus on incremental adaptation. This frames some of the consequences of that.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	38	21	42	Skip this paragraph in the SPM. [Government of Sweden]	Studies have shown the tendency is to focus on incremental adaptation. This frames some of the consequences of doing that. The focus on transformation was made a long time ago in the IPCC Plenary and this carries that decision through.
SPM	21	38	21	42	This is a key statement but is lost to over-technical and overgeneralised language. Please clarify the bold statement and spell out exactly what you mean. As far as I see this is a statement about the need to begin adapting now to long-term climate to avoid locking-in to less resilient pathways and to give time to achieve transformative adaptation. [Government of United Kingdom of Great Britain & Northern Ireland]	The bolding has been removed. The statement is about being inclusive of a broader range of adaptations than just incremental changes to existing systems.
SPM	21	38	21	42	Transformational change should be defined [Government of United Kingdom of Great Britain & Northern Ireland]	This term is defined in the Glossary.
SPM	21	38	21	42	• SPM [P21 L38-42] This might be adversely used in the UNFCCC negotiations by introducing conditionality in adaptation support, including with regard to governance systems. Delete on the basis that adaptation is context specific as underlined above. [Government of Saudi Arabia]	The issues raised here are considered to be important and do not reflect any position on conditionality.
SPM	21	38	21	42	citation? 3.1? 3.3? [Stewart Cohen, Canada]	Citation corrected.
SPM	21	38	21	42	A reference is absent [Government of Russian Federation]	Citation corrected.
SPM	21	38		42	missing a reference to 3.3 [Government of Netherlands]	Citation corrected.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	38		43	<p>Restricting adaptation responses to incremental changes in existing systems and structures, without considering transformational change, may increase costs and losses, and miss out on opportunities. Transformational adaptation includes introduction of new technologies or practices, formation of new structures or systems of governance, adaptation at greater scale or magnitude and shifts in the location of activities.</p> <p>This paragraph is problematic, since transformational adaptation also includes measures such as forced migration that come at high societal external costs and loss of heritage. This should be made more transparent!</p> <p>It is a general shortcoming of the concept of transformational adaptation that it does not differentiate between transformational adaptation measures that come at low or even negative external costs and those with substantial external costs as outlined above.</p> <p>I would suggest the following reformulation to account for this shortcoming:</p> <p>Restricting adaptation responses to incremental changes in existing systems and structures, without considering transformational change, may increase costs and losses, and miss out on opportunities. Transformational adaptation includes introduction of new technologies or practices, formation of new structures or systems of governance, adaptation at greater scale or magnitude and shifts in the location of activities. Transformational adaptation includes measures that come at low or even negative external costs, but may also result in high external costs as e.g. in the case of migration.</p> <p>[Carl-Friedrich Schleussner, Germany]</p>	<p>The statement is about being inclusive of a broader range of adaptations than just incremental changes to existing systems. The cases raised here would be considered maladaptation - there can be maladaptation with incremental adaptation too. Hence we separate these. The points about costs and risks are well-made and with more space could be included.</p>
SPM	21	39	21	40	<p>The word "Transformational" was often misunderstood during discussions about the WGII report. Suggest clarifying and/or explaining further in the SYR. [Government of Canada]</p>	<p>There is introductory material on transformation earlier in Topic 3 and the Glossary defines this as well.</p>
SPM	21	39	21	42	<p>"... may increase costs" - where are the costs of adaptation reported? And the costs of losses due to impacts before adaptation? If there are no clear findings on costs of impacts and adaptation, how is it possible to say that costs may increase? [Government of South Africa]</p>	<p>The statement is about being inclusive of a broader range of adaptations than just incremental changes to existing systems. If a subset of adaptation only is addressed then logically there are possibilities for additional costs being incurred and opportunities missed.</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21	40	21	40	The approach for adaptation as a transformational doesn't give the correct interpretation on the importance that adaptation have and its necessity or sense of urgency. In addition this transformational change have no intenational and national legal context in this report. Transformation it is still a difficult term in the context of the IPCC report and discusions and its content despite was disscused in WG-II there is no consensus in its actions. [Government of Venezuela]	The inclusion of transformation in the SYR was made long ago and approved via IPCC processes. This text attempts to deliver to those decisions. Transformation as used here is simply one end of a spectrum of possible adaptations.
SPM	21	40	21	40	To incorporate what is in red. At the beginning of third sentence: meaning strengthened, altered, or aligned paradigms, goals, or values towards promoting adaptation for sustainable development, including poverty reduction. Transformational adaptation includes introduction of new technologies or practices, formation of new structures or systems of governance, adaptation at greater scale or magnitude and shifts in the location of activities. [Government of Bolivia]	These are good points and with more space could have been addressed.
SPM	21	40	21	42	Transformational adaptation is said to include: 'introduction of new technologies or practices, formation of new structures or systems of governance, adaptation at greater scale or magnitude and shifts in the location of activities'. This is rather loosely worded: surely some new technologies, for example, could be introduced in a rather incremental way. [European Union]	This text has been removed.
SPM	21	41	21	41	"systems of governance" seems too prescriptive (asking for changes in...) how about just "policies" if that is what is meant. [Government of United States of America]	This text has been changed to 'governance structures'.
SPM	21	42	21	42	Line of cite is missing, it should be {3.3} [Thomas Stocker/ WGI TSU, Switzerland]	Citation corrected.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	21				<p>The discussion of adaptation pathways does not do justice to the WGII report findings. It is way too vague and incoherent; the most important issues are probably the limits to adaptation (see fig SPM7), the costs of adaptation and the problem how to design robust adaptation strategies if you do not know the local climate changes in the future. We think the statement should express that for larger temperature rises an ever larger share of impacts cannot be adapted to. A statement on the costs of adaptation is merited here. We suggest to add the unchanged Figure SPM-7 here. See also WGII SPM p.19 where it reads: "Global economic impacts from climate change are difficult to estimate. Economic impact estimates completed over the past 20 years vary in their coverage of subsets of economic sectors and depend on a large number of assumptions, many of which are disputable, and many estimates do not account for catastrophic changes, tipping points, and many other factors. With these recognized limitations, the incomplete estimates of global annual economic losses for additional temperature increases of ~2°C are between 0.2 and 2.0% of income (±1 standard deviation around the mean) (medium evidence, medium agreement). Losses are more likely than not to be greater, rather than smaller, than this range (limited evidence, high agreement). Additionally, there are large differences between and within countries. Losses accelerate with greater warming (limited evidence, high agreement), but few quantitative estimates have been completed for additional warming around 3°C or above. Estimates of the incremental economic impact of emitting carbon dioxide lie between a few dollars and several hundreds of dollars per tonne of carbon60 (robust evidence, medium agreement). Estimates vary strongly with the assumed damage function and discount rate." [Government of Netherlands]</p>	These points do not relate to adaptation costs or benefits. If there was robust material in the AR5 on adaptation costs and benefits we would hve included it.
SPM	22	0			<p>Section 3.3 :The term "climate change risk" is used here. We wonder if it would not be clearer to write "climate change related risk" or "risk associated with climate change"? [Thomas Stocker/ WGI TSU, Switzerland]</p>	Reject. This term is being used all over the SYR and is cosistent with the underlying useage in the WG reports.
SPM	22	0			<p>Just an observation: Section {3.5} of the SYR is not mentioned at all in the SPM. [Thomas Stocker/ WGI TSU, Switzerland]</p>	The structure has been revised
SPM	22	0			<p>Section 3.3: The section lacks uncertainty or likelihood assessment entirely. Those should be added whenever possible. [Thomas Stocker/ WGI TSU, Switzerland]</p>	Uncertainty and confidence assessments have been added.
SPM	22	1	22	38	<p>Include the sentence from WGII SPM 'Mitigation increases the time available for adaptation to a particular level of climate change, potentially by several decades'. This important concept needs to be in the most visible place ie the SPM [Rachel Warren, United Kingdom]</p>	This idea is now included in the SYR and SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	1	22	38	<p>Given that the subsection not only discusses interactions between mitigation and adaptation but also the risks involved, based on subsection 3.4 Climate change risks reduced by mitigation and adaptation from the longer report, request that title of subsection be revised to match/reflect text in the AR5 SYR longer report. If title revision is not done, then request that the text in this subsection should be revised so that readers can understand that the subsection discusses interactions between mitigation and adaptation. For example, suggest addition of text from AR5 SYR longer report (P83, line 42-):</p> <p>Adaptation and mitigation interact with one another in several ways, meaning that decisions about both cannot be made independently (see also Topic 4). Mitigation reduces climate change and therefore reduces the need for adaptation and influences the scope of possible adaptation options. Conversely, the ability to adapt and reduce climate change impact affects required mitigation efforts to limit overall risks. Many mitigation and adaptation measures are directly linked because they may involve trade-offs or synergies at local to global scales (Topic 4.6). For example, bioenergy for mitigation will be subject to climate change and therefore in need of adaptive responses, and large-scale land conversions may influence the ability of other sectors (e.g. ecosystems, urban and rural areas) to adapt to climate change. [Government of Japan]</p>	The section title was misleading and has been changed. Interactions between adaptation and mitigation are mostly covered in Topic 4. Topic 3 is about the balance between the two. The suggested points have been introduced.
SPM	22	1	22	38	<p>This section does not really deal with the argument that adaptation to problems now is an alternative to mitigation of vague future problems with untested methods. It's important to spell out clearly that adaptation and mitigation are complementary not alternatives.</p> <p>Also wonder whether it might not belong with section 4? [Jonathan Lynn, Switzerland]</p>	This is done in the new text.
SPM	22	1	22	38	<p>Why to have a full page on "Interactions between mitigation and adaptation" that only focuses on risks and difficulties? There are a lot co-benefits in their interaction too. [Kaisa Kosonen, Finland]</p>	The section title was misleading and has been changed. Interactions between adaptation and mitigation are mostly covered in Topic 4. Topic 3 is about the balance between the two. The suggested points have been introduced.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	1	22	38	The integrated perspective taken in this section is appreciated but seems rather one-sided. A statement on the cause of the problem, i.e. anthropogenic climate change, and all related risks is needed upfront. The risk of non-action must be mentioned. In addition, the section does not mention synergies and co-benefits of an integrated approach. Furthermore, the statements on the risks of climate change, adaptation and mitigation are not nuanced enough. They give for example the wrong impression the risks of adaptation are of similar significance as those of climate change itself, and that the risks of mitigation are similar to those of unabated climate change (last para on the page). [Government of Germany]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced. Note that the synergies between adaptation and mitigation are covered in Topic 4.
SPM	22	1	22	38	this section needs tightening up, there are errors and repetitions in the text and the length could be reduced. The underlying statements are often repeated text from the overview statement box. I have included some specific comments. There is also nothing here about win-win options e.g. REDD and afforestation both mitigates and provides regional adaptation e.g. water recycling flood control. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The text has been completely revised. Win-win options are mostly covered in Topic 4.
SPM	22	1	22	38	The title of the section is 'Interactions between mitigation and adaptation'. The box (lines) seems to highlight risk management issues on a general level. In our reading, Figure SPM 9 message on substantive risk issues and key vulnerabilities is one of the key figures for the whole report. In other comments we have noted that this figure would be better placed earlier in the report, because it creates a good overview how mitigation and adaptation have different roles in reducing risk. For example ch 2 contains issues on future risks, could the figure be put there? Section 4.4. deals with somewhat similar issues than section 3.3. Could these sections be combined? [Government of Finland]	Thanks. In the revised structure, the figure arrives early in Topic 3, but is still in Topic 3.
SPM	22	1	22	38	The chapeau at the beginning of the page states that "Climate change, mitigation, and adaptation create a large array of risks....."; Further down the page, it refers to adaptation and mitigation as they "involve" risks and uncertainties; on line 14, the text states that "Adaptation and mitigation reduce climate change risks.....". It is a bit confusing drafting, it should be improved, so same terminology is used more consistently. On the other hand, are we want to say that adaptation create risks? [Government of Chile]	Thanks for mentioning this problem. The text has been revised for clarity.
SPM	22	1	22	38	We think there is a need to recast the title to be harmonized with the content. The title is About the Interactions between mitigation and adaptation, however the content is largely about risks associated with mitigation and Adaptation. The headline statement (The statement in the BOX) is not clear and confusing [Government of United Republic of Tanzania]	The section title was misleading and has been changed. Interactions between adaptation and mitigation are mostly covered in Topic 4. Topic 3 is about the balance between the two.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	1			Section 3.3: The structure and content of this section do not seem intuitive. Several different aspects seem to be mixed here such as risks of climate change, how these risks can be reduced by mitigation measures as well as possible adverse interactions between mitigation and adaptation. Therefore the title of the section is not specific enough and might be misunderstood. It would be more logical for this section to focus on all possible interactions between mitigation and adaption, including co-benefits, synergies and adverse effects. Risks associated with climate change under different scenarios should be presented separately from risks of mitigation and adaptation measures, and before the latter. [Government of Norway]	The section title was misleading and has been changed. Interactions between adaptation and mitigation are mostly covered in Topic 4. Topic 3 is about the balance between the two.
SPM	22	1			Section 3.3. Figures SPM.7 and SPM.9 both describes risk of climate change and how these risks can be affected/decreased by adaptation and mitigation, respectively. This is important information that complements each other and could preferably be presented in the same section. We understand that this might be difficult with respect to scoping, but such a section could first cover the risks of climate change (key risks, RfCs), then show how mitigation can reduce these risks, and finally, how adaptation can reduce the risks. Thereafter, limits, risks, co-benefits, synergies, adverse effects and other interactions between mitigation and adaptation could be presented in a separate section. The logical place for such a section would be after mitigation and adaptation measures and policies. This may make the structure of these different aspects as follows: 1. risks of climate change and how these can be reduced by mitigation and adaptation, 2. mitigation and adaptation measures and policies, 3. Limits to, risks of and interactions between mitigation and adaptation. [Government of Norway]	Thanks for the suggestion. The structure of Topic 3 has been revised for more clarity.
SPM	22	1			Section 3.3. This Section focusses only on the negative aspects of these interactions and do not properly reflect the findings from WGII and WGIII SPM. Please consider adding some examples of positive interactions between mitigation and adaptation to present a more balanced Section 3.3. For example consider including the statement from WGII SPM page 24 "Significant co-benefits, synergies, and tradeoffs exist between mitigation and adptation and among different adaptation responses.". Also the risks of non-action should be included. [Government of Norway]	The section title was misleading and has been changed. Interactions between adaptation and mitigation are mostly covered in Topic 4. Topic 3 is about the balance between the two.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	1			Section 3.3: Currently, this section actually has very little to say about the interactions between mitigation and adaptation beyond the obvious fact that less ambitious mitigation means greater climate change means greater adaptation needs. However there is potential for a broader discussion of synergies, including co-benefits. It is also puzzling that there is a section on Interactions between mitigation, adaptation and sustainable development in section 4 about Measures and nothing here in section 3 (Transformation) about interactions with sustainable development. Consider addressing this gap in section 3.3. [Government of Canada]	The section title was misleading and has been changed. Interactions between adaptation and mitigation are mostly covered in Topic 4. Topic 3 is about the balance between the two.
SPM	22	3	22	3	Delete "mitigation and adaptation". [Government of Switzerland]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3	22	3	Climate change, mitigation and adaptation can be read as three issues that are more or less comparable in their potential to create irreversible consequences. Is that the meaning? Or is there something missing? [Government of Finland]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3	22	3	Climate change, mitigation and adaptation create a large array of risks? This makes no sense. If the authors are trying to convey they have their own different kinds of risk then we suggest rephrasing. Its strange to read that climate change and the two solutions to the problem all create risk. [Government of United States of America]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3	22	4	The statement that: "Climate change, mitigation, and adaptation create a large array of risks that differ in nature, magnitude, and their potential to cause irreversible consequences" is very misleading, and risks being used out of context to imply that adaptation and mitigations are inherently risky activities that we should refrain from. We suggest this is deleted [Government of United Kingdom of Great Britain & Northern Ireland]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3	22	4	The sentence, by putting climate change, mitigation and adaptation together as "creating risks" seems unbalanced. Climate change is creating risks. Mitigation and adaptation aim at reducing those risks. However, in doing so, they involve uncertainties and trade-offs. [Government of France]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3	22	7	Can be shortened, [Government of Ireland]	The text has been revised and shortened.
SPM	22	3	22	7	The boxed text doesn't capture the relation between adaptation and mitigation that is intended in section 3.4. We suggest to delete it. [Government of Netherlands]	The text has been completely revised and follows 3.4 (now 3.2) more closely.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	3	22	7	These shaded findings are not as clearly formulated as we would like to see. Please consider to reformulate to: "Adaptation and mitigation can reduce climate change risks and needs to be consider in a holistic approach." or "Adaptation and mitigation choices in the near-term will affect the risks of climate change throughout the 21st century and beyond.", or include them both. [Government of Norway]	This part has been completely rewritten for clarity.
SPM	22	3	22	7	The first sentence of this shaded paragraph is confusing and does not add anything of value - it makes both the problem and the solution sound like they both create large arrays of risk. Suggest deleting the first sentence. The second sentence is a useful highlight statement, but if retained the wording should not be repeated in the bolded sentence two paragraphs below. [Government of Canada]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3	22	7	We suggest removing the first sentence or at least removing it from the highlight box. The second sentence in the highlight box gives the more important policy-relevant statement [Government of United Kingdom of Great Britain & Northern Ireland]	This part has been completely rewritten for clarity.
SPM	22	3	22	38	Here we seem to be using a WG3 or some other definition of 'risk' with regard to climate that is different from that of exposure/vulnerability/etc defined carefully in WG2. This is potentially a major confusion in the SYR and the report cannot have different definitions of 'risk' by using footnotes. For example, in line 9 'risks' seems to be 'uncertainties' rather than WG2 version [Government of United States of America]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	3		7	Please add the following statement: Substantial adverse risks of climate change remain for all levels of mitigation and adaptation assessed. [Carl-Friedrich Schleussner, Germany]	The idea is in the SYR and revised SPM.
SPM	22	4	22	4	Editorial: Please insert a ", " after "regions". [Government of Norway]	Thanks.
SPM	22	6	22	6	Editorial: ..., and involve uncertainties and risks ... [Government of Austria]	Thanks.
SPM	22	6			delete s on the end of "involves" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Thanks.
SPM	22	9	22	9	After tradeoffs can you add "potential synergies in land use sectors" [Government of India]	This part has been completely rewritten for clarity.
SPM	22	9	22	9	Write: "...and adaptation require assessing a broad range ..." [Government of Switzerland]	This part has been completely rewritten for clarity.
SPM	22	9	22	11	I am not keen on the use of the word "impossible" here. It may be impossible at a global scale, but surely the point of what we are doing and models and pathways is to indicate options. I would rather say that the balance between mitigation and adaptation is regionally and socio-economically heterogeneous, it depends on who, where and when you are. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The text has been revised to say that there is no unique best mitigation target.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	9	22	12	Can be shortened,e..g delete text after ethical considerations [Government of Ireland]	This part has been completely rewritten for clarity.
SPM	22	9	22	12	If by saying that it is "impossible to define a single best mitigation target" the authors intend to communicate that there is not a best option from a purely scientific perspective, to ensure clear understanding and avoid unnecessary misunderstanding of the text by policymakers, request addition of "from a purely scientific viewpoint" at the end of the sentence. [Government of Japan]	Even from a policy perspective, there is no "best solution" that would satisfy all stakeholders and individuals. The discussion is now reframed within the decision-making section in 3.1.
SPM	22	9	22	12	This paragraph is currently not relevant. Consider deleting or revising. The concept of "balance between" mitigation and adaptation does not emerge from the SYR, Suggested alternative "Decisions about mitigation and adaptation involve risks and tradeoffs connected with other policy objectives and ethical considerations. It is impossible to define a single best mitigation target or single adaptation approach appropriate across all setting' (using language from WGII SPM, p. 22). Supporting sentence could be revised to refer to "information on various mitigation and climate-resilient pathways ..." [Government of Canada]	This part has been completely rewritten for clarity.
SPM	22	9	22	12	I suggest adding a sentence : "To not mitigate or adapt involves even greater risks." [Tony Weir, Australia]	This part has been completely rewritten for clarity.
SPM	22	10	22	11	The statement that "it is thus impossible to define a single best mitigation target or balance between mitigation and adaptation" seems to ignore that the global community has agreed on limiting temperature increase to below 2 °C, which provides a clear starting point for targets for mitigation; and also has implications for adaptation – if temperature increase is limited to this extent, less adaptation is needed than at higher levels. Rephrase. [Government of South Africa]	Even from a policy perspective, there is no "best solution" that would satisfy all stakeholders and individuals. The discussion is now reframed within the decision-making section in 3.1.
SPM	22	11	22	11	Do we want to suggest that there IS a balance between mitigation and adaptation? Generally we think are they are complimentary and we need to do both and since they are generally funded by different agents [Rachel Warren, United Kingdom]	This part has been completely rewritten for clarity.
SPM	22	11	22	12	delete this sentence, it isnt adding much [Joanna House, United Kingdom of Great Britain & Northern Ireland]	This part has been completely rewritten for clarity.
SPM	22	11	22	12	It's not clear what this sentence means; either clarify or delete. [Government of United States of America]	This part has been completely rewritten for clarity.
SPM	22	14	22	14	Consider inserting the word "practical" between "face" and limits" to differentiate from Limits to Adaptation (introduced previously). [Government of Canada]	This part has been completely rewritten for clarity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	14	22	16	We suggest to replace the bolded sentence by: "Adaptation and mitigation reduce climate change risks, but a lack of mitigation cannot fully be compensated by more adaptation. Hence, the actions taken today constrain the options available in the future to limit temperature change, adapt, and reduce emissions, and therefore create a significant irreversibility that is important for decision-making" {SyR 86, lines 9-11}. [Government of Netherlands]	This part has been completely rewritten for clarity.
SPM	22	14	22	16	The statement "Adaptation and mitigation reduce climate change risks" is a substantially different statement from that in the WG2 SPM that was approved in Yokohama. The approved WG2 SPM states "Adaptation and mitigation choices in the near-term will affect the risks of climate change throughout the 21st century (high confidence)." The wording proposed here lacks a confidence assessment, and goes substantially further than the approved WG2 SPM by making the blanket assessment that adaptation and mitigation reduce risks. Yet there is recognition elsewhere that individual actions, particularly focused on the interests of individual parties, could increase climate risks. The "but" that follows does qualify the statement, but it leaves open the possibility that first part of statement could easily be quoted out of context. Suggest reviewing. [Government of Canada]	This part has been completely rewritten for clarity, and the text is closer to WGII approved language. Confidence statements have been added. Note that co-benefits and negative ancillary effects of adaptation are discussed in Topic 4, not in Topic 3.
SPM	22	14	22	16	Among the important types of uncertainties is the actor's uncertainty (ontological uncertainty) that is missing and it is relevant. The uncertainties regarding the actions that are supposed to be taken by players involved in climate change mitigation or adaptation should not be neglected as they play a major role in achieving the targets. They should be addressed in the documents and discussed in the community so that policy makers take them into account. In particular, while natural uncertainties is imposed on human beings and we cannot communicate with nature to avoid them, the ontological uncertainty can be reduced by simply establishing a dialogue with players and persuading them to follow the path toward a mutual target of reducing climate change risks. [Vahid Mojtahed, Italy]	These issues are now introduced in 3.1. and also discussed in Topic 4.
SPM	22	14	22	16	• SPM [P22 L14-16] repetition as appeared in first paragraph [Government of Saudi Arabia]	This part has been completely rewritten for clarity.
SPM	22	14	22	16	This text is repetitive with the box at the top of the page (lines 3-7), and can, therefore, be deleted. [Government of United States of America]	This part has been completely rewritten for clarity.
SPM	22	14	22	16	The authors should consider adding behavioral/cultural adpation to this, and change the whole first sentence to "Adaptation and mitigation reduce climate change risks, but they face limits linked to resource, institutional, capacity, and behavioral or cultural constraints, and involve uncertainties and risks related to economic, environmental, and societal outcomes." [Government of United States of America]	The issues related to behaviors and culture are now introduced in 3.1. and also discussed in Topic 4.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	14	22	16	This sentence is already printed in the box above. It could be deleted. [Government of France]	This part has been completely rewritten for clarity.
SPM	22	14	22	19	This sentence on line 16 beginning "Adaptation will have relatively..." is the key policy-relevant sentence. We suggest moving this sentence upwards and making it the bold sentence. The earlier sentence (line 14) is too technical and non-specific to be useful to policymakers. [Government of United Kingdom of Great Britain & Northern Ireland]	The section has been rewritten and this point appears now earlier.
SPM	22	14	22	25	Can be shortened, a lot of the text is not adding value. [Government of Ireland]	This part has been completely rewritten for clarity.
SPM	22	14	22	25	Suggest this paragraph should make some reference to the irreversible consequences of climate change to link back to the header which emphasizes that there are differences between climate change, mitigation and adaptation in this respect. [Government of Canada]	We make this distinction in the new version.
SPM	22	14	22	25	Please explore an option where the concept RfC is presented in a paragraph of its own. The current paragraph is rather long, and the RfC texts demands another orientation from the reader anyway. Please, see Finland's comment on page 13 on lines 27-36. [Government of Finland]	RfC are now presented in Topic 2.
SPM	22	14	22	25	This paragraph is incredibly wordy and could be substantively reduced which would make it more consistent with elsewhere. [Peter Thorne, Norway]	This part has been completely rewritten for clarity.
SPM	22	16	22	17	Unclear sentence ("Adaptation will have relatively..."). Is this as opposed to "longer-term" or to "mitigation"? [Government of Sweden]	This part has been completely rewritten for clarity.
SPM	22	16	22	17	"Adaptation will have a relatively more substantial influence on climate risks in the near future" This is an awkward sentence. Many climate risks in the near future are not from anthropogenic climate change?! The whole paragraph is a bit cumbersome to read and understand [Government of Sweden]	This part has been completely rewritten for clarity.
SPM	22	16	22	17	The wording "will have" expresses a certainty, assuming amongst other things confidence that there will be adaptation efforts specifically directed towards limiting the risks of climate change over the short term. Suggest that "will have relatively more substantial influence on climate risks in the near future" be rephrased as "has the potential to have a relatively more substantial influence on climate risks in the near future than mitigation". Note that it is also important, for clarity, to complete the contrast by referring to mitigation rather than leaving the contrast implicit. [Government of Canada]	This part has been completely rewritten for clarity.
SPM	22	16	22	17	Adaptation has relatively more influence on climate risk with respect to what? Mitigation policies? What is the reasoning/evidence behind this line? How confident is the author about this? [Vahid Mojtahed, Italy]	This part has been completely rewritten for clarity.
SPM	22	16	22	17	Please add: Adaptation will have relatively more substantial influence on MANAGING climate risks THAN MITIGATION in the near future. [Government of Finland]	This part has been completely rewritten for clarity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	16	22	19	Could this be better explained, please? It is difficult to grasp the meaning of these sentences. Does this mean that near-term adaptation has more effect and that it is difficult to distangle mitigation and adaptation actions later in the century? [Government of Norway]	This part has been completely rewritten for clarity. And it's covered in the Box Art.2
SPM	22	17	22	19	this sentence as it is non informative. Of course adaptation and mitigations actions will have some consequences on climate risk but are these effets negative or positive? Or they need to be determined and yet is unknown? [Vahid Mojtabeh, Italy]	This part has been completely rewritten for clarity.
SPM	22	18			Consider replacing "previous" with "current and near term" to be more consistent with messages that near term mitigation action is needed. [Government of Canada]	This part has been completely rewritten for clarity.
SPM	22	19	22	19	The reader cannot understand what is meant by "5 reasons for concerns". In the WGII SPM, this is explained on page 13 box SPM1. We suggest to have a brief explanation of the meaning of each "concern" here and keep the link to the Box on article 2 for supplementary information. [Government of Belgium]	RFC are now presented in Topic 2.
SPM	22	19	22	20	Text on RFCs is insufficient. Compared to the AR5 WGII SPM, RFC related text in AR5 SYR SPM seems to have been excessively reduced to the point that runs risk of policymakers who may only read AR5 SYR SPM would have difficulties having a clear idea of what RFCs are. Therefore request further elaboration on RFCs and the 8 key risks to ensure understanding as in AR5 WGII SPM. [Government of Japan]	RFC are now presented in Topic 2.
SPM	22	19	22	20	List the five Reasons for Concern here, together with some examples. [European Union]	RFC are now presented in Topic 2.
SPM	22	20	22	20	The authors need to spell out the RfCs here - perhaps in parentheses. Now the reader has to read half way down the description of Fig SPM.9 to see they are shown along the bottom of panel d. [Government of United States of America]	RFC are now presented in Topic 2.
SPM	22	21	22	21	The text here should be revised to read:"reduced by following various mitigation strategies" [Government of United States of America]	This part has been completely rewritten for clarity.
SPM	22	22	22	22	Suggest to explicitly mention the five RfCs here [Thomas Stocker/ WGI TSU, Switzerland]	RFC are now presented in Topic 2.
SPM	22	22	22	23	The authors should consider deleting the phrase, "As illustrated in Figure SPM.9," since it is not clear that Figure 9 illustrates the point that not all risks can be linked to temperature change. [Government of United States of America]	It was figure SYR 2.6, not SPM.9, sorry for the mistake.
SPM	22	22	22	24	While the phrase "not all risks can be directly linked to temperature change" is correct, it is not illustrated by Fig. SPM.9. Suggest the part of the sentence that says "As illustrated in Figure SPM.9, however, " be deleted. [Government of Canada]	It was figure SYR 2.6, not SPM.9, sorry for the mistake.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	22	22	24	It is unclear how Figure SPM 9 shows that not all risks are linked to temperature change. That might be implicit in the RFCs but the authors need to clarify. [Government of United States of America]	It was figure SYR 2.6, not SPM.9, sorry for the mistake.
SPM	22	23	22	23	What is meant with "other metrics" in this context. Please xconsider to replace with "parameters" since this is actually what you list later in sentence. [Government of Norway]	We now use "factor"
SPM	22	23	22	24	"metrics matter", ... "also matter" - what does matter mean here, the sentence repeats and the choice of verb is weak or jargony. Please clarify. [Government of United States of America]	This part has been completely rewritten for clarity.
SPM	22	23	22	24	Use of matter twice makes no sense and renders the sentence meaningless. Editing required for clarity. [Peter Thorne, Norway]	This part has been completely rewritten for clarity.
SPM	22	23			Please exchange "metrics" with "parameters". In the context of climate change, the expression "metrics" is related to GHG-metrics. [Government of Germany]	We now use "factor"
SPM	22	24	22	24	Request addition of text from AR5 SYR longer report p84, lines 11-14 to AR5 SYR SPM after "rise also matter." on p22, line 24. Figure SPM.9 is important as it integrates the findings from AR5 WGI, II and III SPMs, and therefore should be accompanied by full explanatory text from the AR5 SYR longer report. [Government of Japan]	This part has been completely rewritten for clarity.
SPM	22	24	22	24	last 4 rows of table: for clarity, put the brackets and their numbers on a new line (as was done with "[N: 14]") [Government of Netherlands]	Noted. The table has been completely revised.
SPM	22	24	22	24	Please delete 'also matter' (this fragment is redundant). [Government of France]	This part has been completely rewritten for clarity.
SPM	22	24	22	25	"The Box on Article 2 ..." Please add the information of the existence of the Box on Art. 2 in the introduction when presenting the structure of the SYR, or add 'on page XX of this report' as the broader audience might not be familiar with the SYR structure. [Government of Germany]	Accepted. We now state in the Introduction "The report also contains a Box on Information relevant to Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC)."
SPM	22	24	22	25	For incorrect quotation of the UNFCCC, it is innecessary the inclusion to the reference of the Article 2 of the Convention. [Government of Venezuela]	This part has been completely rewritten for clarity.
SPM	22	24	22	25	Repetition of Article 2 on UNFCCC is not necessary with some effort surely? [Peter Thorne, Norway]	This part has been completely rewritten for clarity.
SPM	22	24			delete "also matter" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	This part has been completely rewritten for clarity.
SPM	22	27	22	28	Clear scientifically sound messages are critical to policymakers thus request inclusion of explicit definition of what "most ambitious target" means. If this is difficult, request rephrasing. [Government of Japan]	This part has been completely rewritten for clarity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	27	22	29	This sentence structure for the sentence starting with "These risks..." does not make sense and should be revised. The parts before and after the dashes do not seem to make sense together. It is also ambiguous how the reader is to interpret the expression "and even wind power". [Government of Canada]	This part has been completely rewritten for clarity.
SPM	22	27	22	31	Please consider to replace "and include" with "including", "carbon capture with storage" with "carbon capture and storage" and delete "even" before "wind power". [Government of Norway]	This part has been completely rewritten for clarity.
SPM	22	27	22	31	"Mitigation also involves risks and uncertainties" this may not be true always and in all locations; so kindly add "under some scenarios or circumstances" [Government of India]	All scenarios with mitigation at the global scale would involve risks and uncertainties, at least in some locations. The text has been revised to give a better balance between the risks from climate change and the risks from mitigation, making sure we do not overstress mitigation risks.
SPM	22	27	22	33	The first unbolded sentence does not seem complete. The bolded risk and uncertainty together with the first unbolded sentence implies that this is all about risks and negative effects. The second sentence goes on to list health, food, security, efficiency of taxation systems (sic!) implying that there are negative risks in all those areas. For balance it should be clear that mitigation can have positive effects on all these factors. The point about taxation systems is strange. If mitigation would reduce the efficiency then one would have to change the taxation system rather than blaming mitigation for negative impacts, right? [Government of Sweden]	This part has been completely rewritten for clarity.
SPM	22	27	22	33	While this part is very important and valuable in that it describes the risks and uncertainties of mitigation in a coherent manner and basically this part should be maintained as it is, it would be helpful if here, the information of technical risks is explained additionally. From the above viewpoint, suggest inserting "the uncertainty of availability and scale of CDR technologies" after "large impacts on vulnerable countries and industries" in line 30. We have proposed to add the information of technical risks and uncertainties of CDR for the line16-17 in page 16. The information should be added to the both, or at least one of them. [Government of Japan]	This text has been largely revised. CDR is discussed in 3.4.
SPM	22	27	22	33	This paragraph sounds negative in the sense that only risks are mentioned. However, a self-sufficient energy-supply, smaller, local energy production on the basis of renewable energy could also have positive effects on human health, energy security, poverty reduction, employment and other factors. Please provide more balanced text. [Government of Germany]	Co-benefits of mitigation are described in details in Topic 4. The point here is to highlight the fact that there are risk-trade-off in mitigation target choices. The text has been revised to be made more balanced however.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	27	22	33	Include information about reversibility of mitigation actions. I think it is a key point that while mitigation does entail risks and uncertainties, these are in general more reversible than climate change impacts, so should be considered differently. [Government of United Kingdom of Great Britain & Northern Ireland]	This point is now made in the text and headline.
SPM	22	27	22	33	What is a "particularly high risk" in this context ? Please clarify. Is it high compared to the risks from climate change ? We think that co-benefits, regarding health in particular, should be included here. Is mitigation generally causing risks regarding human health, even when co-benefits regarding air quality are included ? [Government of Belgium]	This part has been completely rewritten for clarity.
SPM	22	27	22	33	The text here ignores solar power, which is one of the most important renewable component in renewable energy. Why? Is the intention that solar power has no risks? Please clarify. [Government of United States of America]	This part has been completely rewritten for clarity.
SPM	22	27	22	38	I think we should remove these paragraphs. I don't think that talking about risks of mitigation and comparing them with risks of climate change is helpful given the large magnitude of the cc problem. I think this is detail that should not even be in the SYR anywhere let alone in the SPM [Rachel Warren, United Kingdom]	Mitigation risks are an important component of WGIII and are still discussed in the text.
SPM	22	27	22	38	The message that "mitigation also involves risks and uncertainties" is already in bold on line 14. Suggest that these paragraphs be reorganized to ensure a clearer message. Because this paragraph does not discuss interactions between mitigation and adaptation, request that revisions be made to be more in line with title of subsection. [Government of Japan]	This part has been completely rewritten for clarity.
SPM	22	27	22	38	It is important to ensure that the treatment of those risks is fully reflecting knowledge : we could not find the sources for the statement about the risks from low-carbon energy in AR5 WGIII. Please check that the references for each statement in this paragraph are provided in the text of the respective topic, and adapt the text accordingly should it not be fully based on AR5 WGIII and/or SRREN. [Government of Belgium]	AR5 WGIII (especially SPM) do not always use the word "risk" but it describes at length the risks from mitigation options (e.g., from large land-use changes and food security, or technological risks from accidents).

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	27		33	<p>This statement is very tendentious only focussing on adverse side effects without mentioning co-benefits. A check with the WG3 chapters and SPM given as sources in the same paragraph in 3.4 (WGIII 2.1, 2.3-2.5) indicates that such a statement is not supported by the science.</p> <p>In particular, it is a wrong quotation from the WG3 SPM indicating adverse side effects of stringent mitigation pathways for human health, biodiversity conservation etc, where the opposite is the case! This is truly disturbing.</p> <p>Here is the statement from WG3 SPM this relates to:</p> <p>"There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the scale, scope, and pace of implementation. Important examples include biodiversity conservation, water availability, food security, income distribution, efficiency of the taxation system, labour supply and employment, urban sprawl, and the sustain- ability of the growth of developing countries."</p> <p>In addition, the WG3 SPM addresses the issue of adverse side effects:</p> <p>"Some mitigation policies raise the prices for some energy services and could hamper the ability of societ- ies to expand access to modern energy services to underserved populations (low confidence). These potential adverse side-effects can be avoided with the adoption of complementary policies (medium confidence)."</p> <p>These are good and balanced statements and I do not understand, on which grounds its conclusions have been changed. In addition, it is totally unclear what large impacts to vulnerable countries means. What are vulnerable countries with regard to the risk posed by mitigation? What is the basis for such a statement?</p> <p>I'd strongly suggest to delete this statement and replace it by the statement from the WG3 SPM:</p> <p>"There is a wide range of possible adverse side-effects as well as co-benefits and spillovers from climate policy that have not been well-quantified (high confidence). Whether or not side-effects materialize, and to what extent side-effects materialize, will be case- and site-specific, as they will depend on local circumstances and the</p>	Co-benefits of mitigation are described in details in Topic 4. The point here is to highlight the fact that there are risk-trade-off in mitigation target choices. The text has been revised to be made more balanced however.
SPM	22	27			Differentiate between risks and uncertainties. This paragraph is extremely broad. [Government of Sweden]	This part has been completely rewritten for clarity.
SPM	22	27			the uncertainties in the first sentence are not addressed in the following sentences. I suggest either to take it out or expand the text. [Government of Netherlands]	This part has been completely rewritten for clarity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	27			The statement "Mitigation also involves risks and uncertainties" suggests that adaptation involves risks, but the term risk seems to be used very differently. For adaptation, risks relates to the climate impact and the consequences of not adapting, whereas for mitigation risks seem to refer to the consequences of action. A different formulation might work better. Suggest reviewing. [Government of Canada]	This part has been completely rewritten for clarity.
SPM	22	27			It is already stated twice above that mitigation involves risks. Suggest delete this and put the un-bold text below with the bod text in line 9-11 [Joanna House, United Kingdom of Great Britain & Northern Ireland]	This part has been completely rewritten for clarity.
SPM	22	28	22	30	Please sort by risk intensity: replace "including bioenergy, nuclear power, carbon capture with storage, and even wind power" with "including nuclear power, carbon capture with storage, bioenergy, and even wind power" (see also WG3 chap. 7, p, 43, table 7.3). In addition please add "- to varying degrees - " between "those" and "associated". [Government of Germany]	This list of technology has been removed.
SPM	22	29	22	30	Why this selection? Where is solar, wave, tidal? Giving a partial listing seems the worst of both worlds here. Either provide a more comprehensive listing, none at all or be more explicit why you include these and not others. As it stands this partial listing enables vested interests to attack those in or not in this finite example listing so this seems both unwarranted and inadvisable. [Peter Thorne, Norway]	This list of technology has been removed.
SPM	22	29	22	39	The sentence "– including bioenergy, nuclear power, carbon capture with storage, and even wind power – ", should be deleted, for it does not provided a compreehensive analysis of the relation between risks and "large-scale deployment of technology options for producing low-carbon energy". Moreover, the reference "even wind power" translates a value of judgement, connoting that "wind power" would be instinctively thought of not having risks associated with it. [Government of Brazil]	This list of technology has been removed.
SPM	22	29		30	low-carbon energy - including bioenergy, nuclear power, carbon capture with storage, and even wind power ~ why the renewables are not mentioned in general as before (on page 16)? [Government of Hungary]	This list of technology has been removed.
SPM	22	30	22	30	Talking about the risks of wind power in par with nuclear, CCS and bioenergy is not representative of the underlying science. Unless the inclusion of wind in this context can be justified with references to underlying science, it should be removed. [Kaisa Kosonen, Finland]	This list of technology has been removed.
SPM	22	30	22	30	What is the measure of the aggregated economic costs here? Investment? Changes in GDP? Losses in consumption? And is it in monetary terms? Also why there shouldn't be high economic costs if this helps to avoid the worst? i.e why the high economic costs are seen as a risk? [European Union]	Aggregated economic costs can be in terms of investments, GDP or consumption. The text does not say that these economic costs are desirable or not, as it depends on the climate change risks they allow to avoid, as explained in the text.
SPM	22	30	22	31	It is unacceptable to put countries and industries at the same level to make reference to the risks. [Government of Venezuela]	This part has been completely rewritten for clarity.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	30			[five Reasons for Concern (RfC)].... Which are... [Alessandra Conversi, United Kingdom]	This part has been completely rewritten for clarity.
SPM	22	31	22	33	In the paragraph that discusses the risks and uncertainties of mitigation, this sentence notes "They [the risks and uncertainties] also affect human health, food security, energy security, poverty reduction, biodiversity conservation, water availability, income distribution, efficiency of taxation systems, labour supply and employment, urban sprawl, and the growth of developing countries." Unclear what the message is here as climate change risks and uncertainties also have an effect on all these things. Moreover, mitigation is intended to mitigate the adverse effects in many of these areas. Finally, only highlighting the effects on growth in developing countries is problematic. Mitigation risks and uncertainties will affect growth of all countries. Suggest deleting entire sentence, or at least changing the last part to highlight all countries and not just developing ones. As mentioned elsewhere in the SPM, these kinds of long lists are generally not helpful and should be avoided where possible. [Government of Canada]	This list of impact has been removed from the SPM, because of length limitations.
SPM	22	32			• SPM [P22 L32] add fossil fuel export revenues [Government of Saudi Arabia]	This list of impact has been removed from the SPM, because of length limitations.
SPM	22	33	22	33	The part of the sentence "the growth of developing countries" is too vague. Please indicate which "growth" is meant, i.e. growth of population, economic growth, development progress etc. [Government of Germany]	This list of impact has been removed from the SPM, because of length limitations.
SPM	22	33	22	33	"the growth of developing countries" does not provide clarity on the what is being affected by risks. Considerer replacing with "the economic growth of developing countries". Moreover, it is not clear if all elements provided under "They affect human health, food security..." are related to developing countries or only the last one, "growth". Altering the order of elements can resolve this issue. [Government of Brazil]	This list of impact has been removed from the SPM, because of length limitations.
SPM	22	33	22	33	The text "...and the growth of developing countries" is somewhat vague. What kind of growth? Why this relates to developing countries only? We suggest "...and sustainable development" instead of the above [Government of Russian Federation]	This list of impact has been removed from the SPM, because of length limitations.
SPM	22	35	22	35	The invocation of risk here deserves expansion. What is the risk of mitigation - dangers from low-C energy sources? Windfarms killing birds? Or the turbines falling over? [Government of United States of America]	SYR3.2 clarifies that risks include risks from technologies and economic costs.
SPM	22	35	22	36	Please explain more explicitly how risks from mitigation differs from risks from climate change, or give some examples that helps the reader to distinguish better. Also, please consider to point to that a lot of the risks associated with mitigation can be ameliorated by good strategies, management practices and choice of mitigation measures, and try to convey the message that mitigation is necessary to avoid or at least decrease risks associated with climate change. [Government of Norway]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	35	22	36	This paragraph is clumsy and misleading. Suggest deleting. [Government of United Kingdom of Great Britain & Northern Ireland]	The text has been rewritten.
SPM	22	35	22	37	what is meant by '...the level of desirable efforts over the short term is increased by the inertia...'? How about '...higher levels of effort are required over the short term because of the inertia...'? See comment page 86, line 5-7. [Stewart Cohen, Canada]	"Required" is policy prescriptive, we say "increase benefits"
SPM	22	35	22	38	Given the importance of information about the differences between risks from mitigation and risks from climate change (SYR p86, line11) in addition to decision-making challenges for policymakers regarding the irreversibility of climate change impacts (AR5 SYR p86, line 12), request that text in AR5 SYR SPM, longer report p86, lines9-17 be maintained and these concrete explanations be added in SPM. Therefore, request replacement with AR5 SYR longer report text subsection 3.4, p86, lines9-17. [Government of Japan]	The text has been revised to make it clear that risks from climate change and from adaptation and mitigation are of different scales and natures. The new version is more balanced.
SPM	22	35	22	38	Very open ended and vague statement. It is unclear what "the level of desirable efforts" actually means. [Government of Netherlands]	We now say that irrversibilities increase the benefit of early action.
SPM	22	35	22	38	This paragraph is confusing - suggest revising. In the first sentence, do the authors mean "Risks from mitigation and from [unmitigated] climate change"? In the second sentence, it seems that two concepts are being mixed together here in a confusing manner: 1. an iterative risk management framework can allow responses to be dynamic as learning (about climate change, about mitigation and adaptation) grows, 2. in systems with inertia, and where there is potential for irreversible and catastrophic impacts, wait and see approaches are not appropriate and early efforts to mitigate drivers are favoured. Suggest clarifying. It would be useful include examples of the primary irreversible changes that are of concern to the authors, so that this is not left to the imagines of the readers. [Government of Canada]	Thanks for this comment. The text has been rewritten.
SPM	22	36	22	38	I don't understand what this means [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The text has been rewritten.
SPM	22	36	22	38	This sentence is really difficult to understand. Please revise to clarify the text. [Government of United States of America]	The text has been rewritten.
SPM	22	37	22	37	It is suggested to insert "mitigation" after "desirable" in order to enhance clarity. [Government of Austria]	Thanks for this comment. The text has been rewritten.
SPM	22	37			Last three lines are incomprehensible for the unitiated [Government of Sweden]	Thanks for this comment. The text has been rewritten.
SPM	22	38			Catastrophic' is not a good term on a scientific report. [Renato Braghiere, United Kingdom of Great Britain & Northern Ireland]	The text has been rewritten.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22	40	22	40	<p>To include the following paragraph from WGII: Significant co-benefits, synergies, and tradeoffs exist between mitigation and adaptation and among different adaptation responses; interactions occur both within and across regions (very high confidence). Increasing efforts to mitigate and adapt to climate change imply an increasing complexity of interactions, particularly at the intersections among water, energy, land use, and biodiversity, but tools to understand and manage these interactions remain limited.</p> <p>Examples of actions with co-benefits include (i) improved energy efficiency and cleaner energy sources, leading to reduced emissions of health-damaging climate-altering air pollutants; (ii) reduced energy and water consumption in urban areas through greening cities and recycling water; (iii) sustainable agriculture and forestry; and (iv) protection of ecosystems for carbon storage and other environmental functions and ecosystem services. [Government of Bolivia]</p>	Co-benefits of mitigation are described in details in Topic 4. The point here is to highlight the fact that there are risk-trade-off in mitigation target choices. The text has been revised to be made more balanced however.
SPM	22		23		<p>There is a missed opportunity for synthesis here, as most important issues around the interaction of mitigation and adaptation are not discussed. Issues like interchangeability of mitigation and adaptation, the role of mitigation and adaptation in an overall strategy to limit climate change to 2 degrees (fig SPM7), and synergies between mitigation and adaptation (particularly in agriculture, forestry, urban infrastructure, energy and water sectors {WGII 2.5.1}) and where is there a possible conflict? Ideally we would like to see a RCP driven approach that addresses the impact of an RCP on our world, what does this mean for both mitigation and adaptation, and what kind of costs are involved with that.</p> <p>For now we suggest: "Prospects for climate resilient pathways for sustainable development are related to what the world accomplishes with climate change mitigation." (fig SPM7). Both the costs and benefits of adaptation are expected to increase with the magnitude and rate of climate change and associated impacts, but implementation may also become more challenging. Opportunities to take advantage of synergies between adaptation and mitigation may decrease with time, particularly if the limits for adaptation are exceeded." > We suggest to insert Figure WGII 2.4 [Government of Netherlands]</p>	Co-benefits of mitigation are described in details in Topic 4. The point here is to highlight the fact that there are risk-trade-off in mitigation target choices. The text has been revised to be made more balanced however.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	22				• SPM Section 3.3 [P22] Interaction between mitigation and adaptation shall include 'economic diversification' [Government of Saudi Arabia]	Co-benefits of mitigation are described in details in Topic 4. The point here is to highlight the fact that there are risk-trade-off in mitigation target choices. The text has been revised to be made more balanced however.
SPM	22				3.3 Interactions between mitigation and adaptation actually does not explain clearly such interactions (except e.g the very general "it is thus impossible to define .. balance between mitigation and adaptation". The highlighted box text: another text piece (lines 16-19) could better explain the essence, namely: "Adaptation will have relatively more substantial influence on climate risks in the near future. In the second half of the 21st century and beyond, the risks of climate change will increasingly be affected by cumulative impact of previous mitigation and adaptation actions and by their interaction with development pathways." [Government of Hungary]	The section has been completely rewritten.
SPM	23	0	23	0	Very important to keep the burning embers (SPM.9 ,D) in the SPM. [Kaisa Kosonen, Finland]	Noted
SPM	23	0			Caption : The caption contains five direct references to WGII and WGIII : (see table 2.1) line 5 (Table ...) line 12 WGI... line 13 {Ch.19.2} line 24 WGII.. line 24 We wonder if the the SPM should not only refer to the SYR. Since this caption is a copy-paste of the caption of figure 3.4 (SYR page 84), one solution could be to remove this five citations and add {Figure 3.4} at the end of the caption. But this would require a reformulation of some sentences. [Thomas Stocker/ WGI TSU, Switzerland]	Corrected accordingly.
SPM	23	1	23	1	Is the representation of uncertainties in panels A and B scientifically sound? WG III has developed a more convincing representation of ranges, means and medians which should be applied here as well. The use of uncertainty visualisation in A and B should be made consistent. The legend is currently unclear. [Jochen Harnisch, Germany]	The figure has been completely remade and simplified.
SPM	23	1	23	1	Figure SPM9.D addresses risks and should be moved to section 2, where the future risks of CC are discussed. We suggest to delete panels A-C. [Government of Netherlands]	The figure has been completely remade and simplified.
SPM	23	1	23	1	Reference for panel A to the WGIII is not given [Government of Netherlands]	Corrected accordingly.
SPM	23	1	23	1	A:"global mean surface air temperature" whereas B:"global mean temperature": inconsistent [Government of Netherlands]	The figure has been completely remade and simplified.
SPM	23	1	23	1	It is confusing to use two relative references for temperature. On the left 1850-1900 is used and on the right 1986-2005 is used. Please make it consistent. [Government of Netherlands]	We keep the panel because it is approved material from WGII.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23	1	23	1	Caption: reference temperature on right adds to confusing character of graph. Instead of using the additional scale, indicate "current temperature increase" at the 0.6 degree C line. [Government of Netherlands]	We keep the panel because it is approved material from WGII.
SPM	23	1	23	1	Relation between columns in panel D and RFC1-5 unclear. [Government of Netherlands]	The figure has been completely remade and simplified.
SPM	23	1	23	1	This figure is very helpful. [Government of Denmark]	Thanks.
SPM	23	1	23	1	Fig.SPM.9. In the text on pg 22 lines 22-24 we say that not all risks are related to temperature. So why would we complicate this figure by adding TWO temperature charts. Please simplify. [Government of United States of America]	We keep the panel because it is approved material from WGII.
SPM	23	1	23	1	Figure SPM.9, panel d: The figure legend is already quite large. But, panel d wasn't sufficiently described in terms of what exactly define the five reasons for concerns. This could be resolved by simply providing definitions with a couple of examples. [Government of United States of America]	The caption is the SYR provides an example. Because of length constraint, the version in the SPM cannot include the same addition.
SPM	23	1	23	1	SPM.9: All four parts of this figure (a - d) do not seem essential; part (c) and possibly also either (a) or (b) could be deleted with no loss of clarity. [Government of United States of America]	The figure has been completely remade and simplified.
SPM	23	1	23	1	The legend for Figure SPM.9, includes a Reference to "Reasons for Concern" referring to them as THE RfC. There does not appear to be any explanatory text anywhere preceding the Figure that would explain how the RfCs were identified (and by whom). Need to bring some of that context into the SPM for those readers who may only stop with the SPM. [Government of United States of America]	RFC are now presented in Topic 2.
SPM	23	1	23	1	Figure SPM.9: The projections should include some margin of error or uncertainty [Government of United States of America]	RFC are now presented in Topic 2.
SPM	23	1	23	1	Per earlier comment on the text what on earth is meant by 'climate uncertainty'. To my knowledge this has not been defined. I think the authors mean TCR uncertainty but to be honest I'm not sure. Regardless climate uncertainty is an ambiguous term at best and not defined in WG1 to my knowledge. [Peter Thorne, Norway]	Details are now provided in the caption of Figure 2.2.
SPM	23	1	23	9	p 23, Figure SPM.9 caption refers to MAGICC as a climate model. The policymaker may very well find this confusing as the CMIP5 simulations are done with climate models. Please spend some time to discuss MAGICC vs CMIP5, etc - if even in a footnote. [Government of United States of America]	Details are now provided in the caption of Figure 2.2.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23	1	23	26	Need to communicate clearly that RFC1 contains also biodiversity loss in hotpots, tops of mountains, islands, etc. RFC4 refers to global scale loss of widespread and common species. How to communicate this clearly? Suggest to add to description of RFC1: biodiversity hotspots. Edit RFC4 to say 'loss of common and widespread biodiversity'. Basically the idea being that a lot of rare species with small ranges are in RFC1 and the common species which we see every day are in RFC4. The rare species covered in RFC1 are not contained in RFC4, else the ember would look different. So - very important we say biodiversity is in RFC1 also ... [Rachel Warren, United Kingdom]	RFC are now presented in Topic 2.
SPM	23	1	23	26	The figure SPM.9 was the result of the interesting debate in the review of the WG-II in Yokohama. The color of the graphics that shows the period 1850-1900 on the left should be more dark because is not easy to see. [Government of Venezuela]	Noted.
SPM	23	1			Figure SPM.9: Although the effort to provide synthesis in this figure is appreciated, suggest that the figure in the WGII SPM was simpler and easier to understand. Per one of Canada's overall comments, we find that this figure draws attention to differences in the approaches of the different WGs, whereas the SYR should focus on bringing this information together. Consider replacing with the WGII figure or revising. [Government of Canada]	The figure has been completely remade and simplified. Hopefully it now gives a more comprehensive vizualization of the problem (including the complementarity between WG approaches).
SPM	23	1			Figure SPM.9. We assume that this figure will be finalized taking approved figures from the WG reports into account, that full traceback will be provided for all figure components, and that terms such as "climate uncertainty" will be defined (this term is specific to WG3, and appears to encompass a number of contributions to uncertainty, including the effects of natural internal variability on the climate system and uncertainty associated with the formulation and implementation of climate models of varying levels of complexity). [Government of Canada]	Details are now provided in the caption of Figure 2.2.
SPM	23	1			Figure SPM.9: Recommend that the SPM and SYR find a way to describe the scenario classes assessed by WGIII with labels that make clear that these categories are not all achieving the single atmospheric GHG concentration used to identify the scenario class. While this information is given in the figure caption, the figure itself could be misinterpreted. At a minimum, the x-axis on the 2nd panels top and bottom should indicate that these are scenario labels. Perhaps they could be called Scenario Class 450, 500 etc. (SC450, SC500). [Government of Canada]	Corrected accordingly.
SPM	23	1			Figure SPM.9: Regarding figure clarity, recommend this Figure be enlarged to becomes a double page spread and that efforts be made to break up the caption into readable chunks of text. [Government of Canada]	The figure has been completely remade and simplified.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23	1		<p>Figure SPM.9: We think this figure has the potential to be a very important synthesis figure and appreciate the attempt to integrate information from WG1 and WG3 and have suggestion for improvements:</p> <ul style="list-style-type: none"> - the figure is complex and hard to understand for lay people. Please extend the explanation in the SPM text. - The general structure of the figure should ideally be an easy visual sequence of 1) Sectoral emissions (new panel based on 2050 bars of left panel of AR5 WG3 TS.17 for 450 category example), 2) global emissions (current panel C), 3) then global-mean temperatures (merged panels A & B) and 4) the risks (current panel D). The flow of for the eye could be achieved by ordering Panel 1), 2) and 3) on top of each other with panels 2) and 3) sharing the same x-axis of scenario categories, panel 1) being a focus on the first scenario category and Panel 4) being located to the right side of panel 3) to share the same vertical temperature axis.. - Current panels (a) and (b): These panels show both the increase of temperature for different scenarios. They prove that the models used in WGI and WGIII are consistent. While this is highly important for scientists and their informed readership, it might be confusing for lay people or policy makers. We therefore suggest to provide this information jointly in a simplified way in one graph. For example, the x axis labels could simply be "450 500 550 580-720 Baselines" with the RCPs being plotted and labelled in the figure at the respective x-axis locations, i.e. RCP2.6 within the 450 column, RCP4.5 into the 580-720 band ..etc. - see WG3 SPM.1. - The important point about an extra panel on sectoral emissions are that it would show the decarbonisation time point for the electricity sector (around 2050 for 450 category), which is a major piece of policy relevant information that is otherwise not shown in graphical form in SYR. - Please take care that all panels use the same time periods for temperature. Currently (a) is 2081-2100; (b) is 2100; and a,b,d have the baselines 1850-1900 and 1986-2005. - panel (a) and (b): in (a) "global mean surface air temperature" is used and in (b) just "global mean temperature". Please be precise and use the same wording if the same sort of temperature is meant. - the thermometer on the left side is hardly visible, please improve. - the captions explaining the thermometers should be placed vertically beside the thermometers, as in the respective figure in WG2 SPM. - panels (b) and (c): the label of the x-axis should be renamed into scenario categories [Government of Germany] 	<p>The figure has been completely remade and simplified. In particular, information from WGI and WGIII are better integrated (new panel B). The multiple axis are kept to use as much as possible approved material from WGs.</p>
SPM	23	1		<p>To facilitate reading, we suggest separating the list of examples associated with the RCPs from the caption. This could be on the figure itself (provided that it is printed in a larger size, in landscape orientation if needed) or in a small table printed close or in the figure. [Government of Belgium]</p>	<p>The figure has been completely remade and simplified.</p>

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23	2	23	26	The text here is too complicated and hard to read to be of value to a policymaker. Please revise for clarity. [Government of United States of America]	The figure has been completely remade and simplified. The caption has also been revised. In particular, the caption in SYR3.2 now includes an example to guide the reader.
SPM	23	2	23	26	This figure caption is far too long and complex and suggests that the figure itself is perhaps too complex for an SPM figure [Peter Thorne, Norway]	The figure has been completely remade and simplified. The caption has also been revised. In particular, the caption in SYR3.2 now includes an example to guide the reader.
SPM	23	3	23	3	Editorial: please, check correct abbreviation for Reasons for Concerns: usually it is RFC, not RfC [Government of Russian Federation]	Corrected accordingly.
SPM	23	5	23	5	It is suggested to insert "relative to 1850-1900" after "projected change in global temperature in 2081-2100" in order to enhance clarity. [Government of Austria]	The figure has been revised.
SPM	23	8	23	8	For the "uncertainty in the climate system", suggest this indicate what is the likelihood of this uncertainty range. By implication from panel A, it would be assumed that this is the likely range; if not then this should be stated. [Haroon Kheshgi, United States of America]	The figure has been revised.
SPM	23	9	23	12	<Figure SPM.9 (C)> Based on the Table 6.3 of WG3 Final Draft, this bar graph should be corrected to indicate -57% to +4% in the 500ppm scenario and -47% to +7% in the 550ppm scenario. [Hirofumi Kazuno, Japan]	The figure has been revised.
SPM	23	10	23	12	To avoid confusions with the 40-70 statements used in other parts of the SYR SPM. Please consider to replace "41 and 72 % percent" with "40 and 70 %". You should also consider to link this text to the 2 degree goal. [Government of Norway]	The figure has been revised.
SPM	23	12	23	26	<Figure SPM.9 (D)> This graph should be deleted from Figure SPM.9 because it is based on subjective judgments by experts in each category and is a quite different kind of graph from (A), (B) and (C), which are based on model analyses, or objective results. They should not be compared in the same line. [Hirofumi Kazuno, Japan]	This panel is approved material from WGII.
SPM	23	13	23	14	It is stated that "Panel d reproduces the five reasons for concerns from WGII Assessment Box SPM.1 Figure 1, using the same temperature axis than Panel a". However, this is not fully clear because panel d has 2 temperature axis. A note about the right temperature axis could be added [Thomas Stocker/ WGI TSU, Switzerland]	The caption has been simplified. We keep the 2 axes because it is approved material from WGII.
SPM	23	13	23	14	Grammatical error: "Same temperature axis than panel a" should be "Same temperature axis as panel a" [Government of Canada]	Corrected accordingly.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23	16	23	16	It is suggested to insert a footnote after the wording: ..and then sustained or exceeded. This footnote should clarify that the calculation of the risks does not consider the likelihood of reaching a certain temperature level by 2100. [Government of Austria]	We use the temperature change by 2100.
SPM	23	19	23	19	You can remove colour description of risk as it is in a legend in a figure. [Government of Netherlands]	The figure has been revised.
SPM	23	20	23	20	The authors should consider writing out the five "Reasons for Concern" in the main text. [Government of United States of America]	Corrected accordingly.
SPM	23	24	23	24	Note the different temperature baselines used in WGII Assessment Box SPM.1 Figure 1.' Please explain why different temp. baselines are used. [European Union]	We keep the 2 axes because it is approved material from WGII.
SPM	23	25	23	26	Unclear which scenarios the "lowest three" and the "most of the others" refer to. RCPs? MAGICC-based scenario groups? Individual scenarios withing the latter? [Government of Sweden]	The caption has been revised and simplified.
SPM	23	25	23	26	What are the scenarios referred to here ? ("most of the lowest three... most of the others" : are these WGIII scenario categories, rather than scenarios ?) [Government of Belgium]	The caption has been revised and simplified.
SPM	23	25	23	26	What are "the lowest three scenarios"? What are "most of the others"? I could not get it. [KIYOSHI TAKAHASHI, Japan]	The caption has been revised and simplified.
SPM	23		23		Figure SPM.9: It is suggested to illustrate how to "read" this figure, by linking all the graphs with a storyline, and to place the RFC graph in the center, since it is the key integrated element [Government of Spain]	An example to guide the reader is in the caption of the figure in the SYR (but space limits make it difficult to include the example in the SPM).
SPM	23		23		Figure SPM9: it is not clear why the y axis on chart D has a negative range when it is about global warming. Also, the scale on this chart and on all charts to the left should be the same. More importantly, however, this figure is one of the most important figures, but it is difficult to read and include unnecessary information (e.g. by excluding redundant information that was already reported earlier). Chart D should be the main chart, and that could be combined with chart A to show maybe just two scenarios of temperature increase. CO2 concentrations may be just proxy in the context of policy making, what is important here is that "if I do this and that" (two temperature scenarios), "then the effects will be this and that" (in terms of chart D). However, the "five reasons for concern" are too abstract. Other concepts such as weather related events, biodiversity, food production, health, water, disposition of people etc. would be easier to perceive and digest. [Government of Hungary]	The figure has been simplified and revised, taking into account your suggestions. The panel D is now the starting point of the figure.
SPM	23				Figure SPM.9. Suggest switching (A) and (D) as policymakers are more interested in learning how much impact is acceptable (D) and which reduction pathways to choose (C), than which RCP to choose (A). [Government of Japan]	The figure has been simplified and revised, taking into account your suggestions. The panel D is now the starting point of the figure.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23				Figure SPM 9. Delete the burning ember figure (D). The 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. It should not be listed with (A)(B)(C) that are scientifically solid findings. Should you keep (D) despite this comment, make it very clear that "This figure is subjective as it is based on expert judgement". [Taishi SUGIYAMA, Japan]	This panel is approved material from WGII.
SPM	23				Figure SPM.9. Please add "ppm" on the horizontal axis in panel C, and consider to give the ppm values associated with the different RCPs in panel A. If it is possible to link the different RCPs with ppm values, an alternative could be to merge the two panels together and present the data in one panel that clearly distinguishing RCP from WGIII scenarios by e.g different colors. [Government of Norway]	The figure has been revised.
SPM	23				Figure SPM.9. Please consider drawing the same thermometers in all panels (A,B, and D) to avoid confusion. Please also consider to write "RFC 1", "RFC 2", etc. on the horizontal axis in Panel D to make the link with the figure caption easier. [Government of Norway]	The figure has been revised.
SPM	23				Figure SPM 9. The labels are very faint. Consider increasing the font size or making them bold [Government of Kenya]	The figure has been revised.
SPM	23				Figure SPM.9. Horizontal axis of (A) shows RCP but that of (B) and (c) show PPM. It is better to be uniformed form for the convenience of audiences. [Takashi Hongo, Japan]	The figure has been revised.
SPM	23				Fig SPM-9 adds synthesis value to this report. Good. [Tony Weir, Australia]	Thanks
SPM	23				SPM Fig 9 NOTE: For policy guidance, committed temperature should be included. The burning embers temperature increases are actual impacts, not risks of impacts. This is obvious from the "extreme weather events Reason for Concern (RfC)" that was increasing in the 2007 AR4. SPM.9 is therefore grossly policy-misleading. (Cont'd.) [Peter Carter, Canada]	This figure is already complex and we decided against adding new information, in spite of the interest of the committed temperature.
SPM	23				Cont'd. Even so, the "burning embers" graphic shows that the 2°C policy target is extremely dangerous (hazardous) because at today's warming of 0.8°C, RfC 1 is into the red zone, RfC 2 is into the red zone, and RfC 3 is into the orange zone. The extreme danger is even more obvious because the committed warming added from the ocean heat lag alone gets us to 1.4°C (mean) by 2100. At 1.4°C, RfC 1 is deep red to purple, RfC 2 is deep red, RfC 3 is deep orange, and RfC 5 is deep orange. The 1.5°C policy target is also extremely dangerous. There are other unavoidable sources of total committed warming that push the RfCs even higher up the burning embers. The embers show clearly that though RCP2.6 is the safest of all the RCPs, it is still dangerous (hazardous) and we are in a state of committed global climate change planetary emergency. [Peter Carter, Canada]	This figure is already complex and we decided against adding new information, in spite of the interest of the committed temperature.
SPM	23				Figure SPM.9 caption using lower case letters eg. "Panel a", but the figures are marked with capital letters eg. "A". [Government of Vietnam]	The figure has been revised.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	23				Fig. spm9. I believe that the legend is too full of information and too long for the SPM: unlikely that policy makers will read it. Leave the full figure in the chapter, but provide a condensed version for the spm [Alessandra Conversi, United Kingdom]	The figure has been revised.
SPM	23				figure SPM.9 Given a similar figure in the SPM of the TAR it is suggested to include some guidance on the comparison of panel d of figure SPM.9 and the corresponding figure in the TAR. [Government of Austria]	Space constraints make it impossible to add this element. Thanks for the suggestion.
SPM	23				Figure SPM9 : the order of the label for the different panels is not logical. [Government of France]	The figure has been revised.
SPM	23				Figure SPM.9 contains many different informations (mitigation scenarios, projected temperatures, projected risks) and might be hard to explain in a summary for policymakers. A further simplification of the figure would be useful. [Government of France]	The figure has been revised.
SPM	24	1	24	1	The headline is "Adaptation and Mitigation Measures". However, in the text below mitigation measures are described first, and then adaptation measures (=reversed order compared to the headline) [Government of Sweden]	We are now consistently using "adaptation and mitigation" to conform with the sequence in which those issues are dealt with in the underlying topics.
SPM	24	1	24	1	"Adaptation and Mitigation Measures" --> "Mitigation and Adaptation Measures" --> appropriate to the order of the topics in the text [Government of Germany]	We are now consistently using "adaptation and mitigation" to conform with the sequence in which those issues are dealt with in the underlying topics.
SPM	24	1	24	1	The authors should consider more aptly titling this: "Adaptation & Mitigation Pathways" . [Government of United States of America]	The heading for this section is based on the approved title of the underlying topic.
SPM	24	1	24	48	It would be good to see some actual data on amount of mitigation ptoential and cost for energy and AFOLU options. This section could really have a wealth of quantitative information, This is what policy and decision makers want to know, not just that we have to mitigate, but how to do it and what it will cost. This really should be one of the longest sections of the SPM and instead it is quite short. If you are limites for space cut down on other sections e.g. 4.2, 3.3 [Joanna House, United Kingdom of Great Britain & Northern Ireland]	This has been included in the underlying topics. A figure is included in the SPM that shows the amount of abatement in different sectors. Space constraints on the SPM as a whole limit the amount of information that can be provided, within the overall constraints set by the Panel.
SPM	24	1	27	12	The whole section 4 lacks of data (mitigation potentials) and does not refers clearly to investments needed to e.g. reach the 2 degrees target. [Government of Switzerland]	Some quantitative information is now provided in a new Figure, and reference made to investments and finance needed for a 2 degree goal. Space constraints on the SPM as a whole limit the amount of information that can be provided, within the overall constraints set by the Panel.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	1			Section 4. We would like to see a couple of examples added on what adaptation and mitigation measures two countris with very different economy/climate ect. would have to undertake in order to contribute to fulfill the 2 deg goal. [Government of Norway]	The revised text and the underlying reports make clear that individual choices are determined by national circumstances and development goals, and we would not find it useful or feasible to single out two "model" countries to represent actions more broadly.
SPM	24	3	24	50	What is the difference between measures and policies? Please clarify [Government of United States of America]	The expression "policies and measures" is used widely in the UNFCCC context. In our interpretation, policies are a more focussed effort, whereas 'measures' includes a broader range of actions that also include bottom-up activities. We are using the terms as appropriate in the text but don't feel the report would benefit from attempting a strict definition of those terms.
SPM	24	3			Section 4.1: We recommend that the section on Mitigation Measures (4.1) have a paragraph dedicated to talking about measures to achieve net negative carbon emissions. As the WGI and WGIII reports have shown, these measures are critically important to achieving low stabilization scenarios. Understanding how these are integrated into mitigation scenarios achieving low stabilization targets and understanding assumptions about their availability, is critical. [Government of Canada]	The need for net negative emissions (BECCS) is discussed in the (revised) preceding section 3.
SPM	24	5	24	5	low levels' is unclear. 450ppm is high compared to pre-industrial concentrations of 280. [European Union]	low stabilisation levels is the wording used in the WGIII SPM and we see insufficient justification to revise this; the revised text makes is clear what actual concentration levels are referred to.
SPM	24	5	24	6	Mitigation is not only an issue of the economy, please modify. [Government of Germany]	Wording revised to address this comment
SPM	24	5	24	6	It is suggested to substitute "throughout the economy" by the wording "throughout all economic sectors". [Government of Austria]	This comment has become obsolete since the text has been revised substantially, following further revisions of the underlying topic and major revisions to the SPM. Wherever possible within space constraints, wording from approved Working Group SPMs has been used in preference over alternative formulations.
SPM	24	5	24	10	We suggest to delete the boxed text, but we suggest to retain the first two sentences, make these bolded and move lines 42-48 as not bolded to follow these two sentences. [Government of Netherlands]	The entire section has been revised substantially, and some elements of this text have been retained.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	5	24	10	The main finding on mitigation measures in this boxed text makes no reference to avoiding deforestation. Yet on the same page (l 35-40) it states "The AFOLU sector plays a key role in low stabilization scenarios because it provides options to remove carbon dioxide from the atmosphere (high confidence)". At least a sentence about the key or central role of AFOLU in low stabilisation must be reflected in the summary upfront [Government of South Africa]	The revised summary finding from topic 4 no longer refers to specific sectors for mitigation; a summary finding further down makes explicit reference to emissions from AFOLU.
SPM	24	5	24	12	The "decarbonisation" was a point of confusion in discussions about WGII - suggest it could be avoided here and elsewhere. If it remains, there will need to be a robust explanation provided of what this means and the distinction between "decarbonized" and "full decarbonization". It would also be good to avoid jargon, such as "lock-in". [Government of Canada]	We are using the term 'decarbonization' as it was approved in the wording of the WGIII SPM, which ensures consistency with the underlying report and should avoid confusion. The word "lock-in" is no longer used.
SPM	24	5	24	48	This section is full of generic statements which probably can be found in many previous IPCC reports. Why not present the role for different sectors, the potentials and the costs in stabilizing the warming at 2C [Government of India]	The entire section has been revised substantially based on this and other comments.
SPM	24	5		7	RETAIN: "Stabilizing GHG concentrations in the atmosphere at low levels requires mitigation throughout the economy. [...] Low stabilization scenarios are dependent upon a full decarbonisation of energy supply." ADD: Decarbonisation is the replacement of all fossil fuel energy by true, clean zero/lowest carbon energy sources. Clean energy does not include biofuels, carbon capture and storage (CCS), or biomass with CCS. ADD: It must be stated that the only mitigation scenario that can be considered as mitigation at this time and as a basis for adaptation to global climate change is RCP2.6. [Peter Carter, Canada]	This material is now covered in section 3 of the SPM, as section 4 focuses on specific measures to achieve long-term goals.
SPM	24	6	24	6	"(medium confidence)" should be added after "others". (seen original sentence in SYR p.96 line 5) [Thomas Stocker/ WGI TSU, Switzerland]	The headline has been revised substantially; the confidence rating has not been included since it is also no longer used in the underlying report.
SPM	24	6	24	6	The phrase "Efforts in one sector determine the needs of others" seems to be vague and not to add value to the chapeau. It is understood that the phrase insights about the dynamic interlink of adopting mitigation and adaptation strategies. But it is not clear how effort in one sector define needs for other. E.g. How deploying CCS in the power sector would shape the needs of the building sector? It is suggested that the sentence is better clarified otherwise be removed. [Tabaré Arroyo Currás, Mexico]	This expression is no longer used in the overarching summary finding from topic 4.
SPM	24	6	24	6	Please add "to mitigate ghg emissions" after "Efforts". [Government of Germany]	The wording has been revised substantially, making this specific comment obsolete.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	6	24	6	Efforts in one sector determine the needs in others' - it is not clear what this sentence means. If it means that it will be necessary to mitigate to a greater extent in some sectors (where it is possible/easier/cheaper) and mitigate to a lesser extent in other sectors (where it's not possible/difficult/expensive) please state this. If it is not appropriate to state this please remove the sentence. In the previous sentence 'mitigation throughout the economy' has been mentioned. [European Union]	This expression is no longer used in the overarching summary finding from topic 4.
SPM	24	6	24	7	We suggest to replace "Efforts in one sector determine the needs in others. Low stabilisation scenarios are dependent upon a full carbonisation of energy supply." with text in WGIII SPM "There are strong interdependencies in mitigation scenarios between the pace of introducing mitigation measures in energy supply and energy end-use and developments in the AFOLU sector (high confidence). The distribution of the mitigation effort across sectors is strongly influenced by the availability and performance of BECCS and large scale afforestation. This is particularly the case in low stabilisation scenarios." [Government of Finland]	This expression is no longer used in the overarching summary finding from topic 4. The wording has been partly retained for a summary finding from section 4.3 (mitigation), where its context is clearer.
SPM	24	6	24	7	Suggest deletion or revision. Statement "Low stabilization scenarios are dependent on a full decarbonisation of energy supply" is not supported by WGIII SPM and AR5 and should be deleted. If alternate text sought, could use: "While stabilizing CO2eq concentrations requires fundamental changes to the global energy supply systems, a portfolio of measures is available that includes the reduction of final energy demand through enhanced efficiency or behaviours, and the introduction of low-carbon supply options such as renewables, nuclear, CCS, in combination with fossil or biomass energy conversion processes, and finally, improvements in the efficiency of fossil fuel use." (ref. WGIII AR5, 7.11.2 p58) [Government of Australia]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	6			replace the word "economy" with "society". This is relevant also for activities outside the formal economy [Government of Sweden]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	6			Do you really need "Efforts in one sector determine the needs in others" as a headline result, it seems fairly obvious and doesn't need to be said at this high level of headline. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	6			• SPM Section 4.1 [P24 L6] delete 'efforts in one sector determine the needs in others' [Government of Saudi Arabia]	The wording has been revised substantially, making this specific comment obsolete.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	7	24	7	Page 99 lines 1-4 The Idea of Full Decarbonization is not supported by SYR. In Page 99 lines 1-4 It can be read "Energy system related mitigation measures include the decarbonization of the energy supply sector, final energy demand reductions, and switching to low-carbon fuels, including decarbonized electricity. Their relative importance varies with the availability of advanced technologies, cost and the level of behavioural, lifestyle and cultural change." This is referred to the reduction of carbon to generated electricity instead a full decarbonization that in the practice is unrealistic specially in the short time. I suggest change "Low stabilization scenarios are dependent upon a full decarbonisation of energy supply" for "Low stabilization scenarios are dependent of the degree of decarbonisation of electricity supply" [Carlos Méndez, Venezuela]	The wording has been revised substantially, making this specific comment obsolete. The finding is part of a summary finding from section 4.3, and is consistent with approved WGIII SPM conclusions.
SPM	24	7	24	7	"in the long term" should be added after "supply" (see original sentence in SYR p.96 lines 6-7) [Thomas Stocker/ WGI TSU, Switzerland]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	7	24	7	Suggested to add "low-carbon" between "[...]up-scaling of [...]" and "[...]energy supply technologies[...]" [Tabaré Arroyo Currás, Mexico]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	7	24	7	Suggest replacing "depend upon" with "require" [Government of United Kingdom of Great Britain & Northern Ireland]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	7	24	7	The "full decarbonization of energy supply" is an unrealistic goal and a prescriptive statement that gives the impression of being utopic. Besides, it doesn't take into consideration a balanced situation on the energy demand and the energy needs for the development in the developing countries. This information without the complementary energy components it is unrealizable. [Government of Venezuela]	The wording has been revised substantially, making this specific comment obsolete. The finding is part of a summary finding from section 4.3, and is consistent with approved WGIII SPM conclusions.
SPM	24	7	24	9	Noting that this statement is qualified with "can", it would be helpful to note the specific development conditions under which this statement would be true. [Government of New Zealand]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	7			Suggest changing "limit" to "reduce", to better convey the idea that lower mitigation requirements would be a good thing. [Government of New Zealand]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	8	24	8	"(high confidence)" should be added after "requirements" (see SYR p.96 lines 28-29) [Thomas Stocker/ WGI TSU, Switzerland]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	9	24	9	"(medium confidence)" should be added after "scenarios" (see SYR p.96 lines 35-36) [Thomas Stocker/ WGI TSU, Switzerland]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	9	24	9	Suggested to re-consider the phrase "carbon-intensive infrastructure" for "carbon-based infrastructure". It is believed that popular wisdom will most likely associate "carbon-intensive" w/ coal and oils excluding conventional/ non-conventional gas. [Tabaré Arroyo Currás, Mexico]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	12	24	12	We suggest to replace the current bolded text by: "Low stabilisation scenarios are dependent upon a full decarbonisation of energy supply." (from the boxed text) [Government of Netherlands]	The wording has been revised substantially, making this specific comment obsolete.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	12	24	13	Decarbonizing (i.e. reducing the carbon intensity of) electricity generation is a key component of cost-effective mitigation strategies in achieving low-stabilization levels: - > Delete 'cost effective'. It is uncertain whether decarbonization of electricity generation is a cost-effective mitigation strategy as can be seen by the current wind and solar generations. Such a reference can be misleading at the current stage. [Government of Republic of Korea]	The wording has been revised substantially, making this specific comment obsolete.
SPM	24	12	24	14	What governs where "evidence" or "agreement" are used as a framework vs. confidence? It is strange to have one used for electricity and the other for efficiency. The authors should consider using the first framework for both unless there is a defining reason to do it this way. [Government of United States of America]	This is generally determined by the uncertainty qualifier used in the underlying report; where a synthetic finding is generated, authors applied their judgement consistent with the uncertainty guidance note prepared by the IPCC to support the 5th Assessment Report.
SPM	24	12	24	16	Suggest adding the sentence: "Near-term GHG emissions can be reduced by replacing current world average coal-fired plants with highly efficient natural gas combined cycle (NGCC) plants or combined heat and power (CHP) plants, provided that natural gas is available and the fugitive emissions associated with extraction and supply are low or mitigated." The sentence could follow "..., carbon dioxide capture and storage (CCS)" in line 16. The text will then correspond with the language in topic 4.3 page 99 line 6-11. [Government of Norway]	The section has been restructured fundamentally, which means this comment no longer applies. It also appears too detailed to be justified for inclusion in the space-constrained SPM.
SPM	24	12	24	21	The text here contains very useful information about the mitigation options therefore should be maintained as it is. [Government of Japan]	The section has been restructured fundamentally, which means this comment no longer applies. Elements of this text have been retained and used later in this section.
SPM	24	12	24	21	To be more specific in the bold statement, it could read: "Decarbonizing (i.e. reducing the carbon intensity of) the energy supply, in particular the electricity generation, is a key ..." [Government of Germany]	The section has been restructured fundamentally, which means this comment no longer applies. Elements of this text have been retained and used later in this section.
SPM	24	12	24	21	There is no mention of higher conversion efficiencies of fossil generation of electricity. Globally there will still be massive investments in fossil generation in the short to medium run [H-Holger Rogner, Austria]	The section has been restructured fundamentally, which means this comment no longer applies. It also appears too detailed to be justified for inclusion in the space-constrained SPM.
SPM	24	12	24	40	RE is described as a crucial option of decarbonization of electricity and biomass is an important source of RE. At the line 35, AFOLU sector is mentioned as a key too and furthermore biomass CCS's role is introduced at the scenario. I am afraid that audience will be confused when they think about the role of biomass energy and it is recommended to add some explanation here. [Takashi Hongo, Japan]	The section has been revised fundamentally, hopefully addressing this concern along with many others.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	12		13	RETAIN: "Decarbonizing [REMOVE: i.e. reducing the carbon intensity of]) electricity generation is a key component of cost-effective mitigation strategies in achieving low-stabilization levels" ADD: Decarbonization can only mean replacement of fossil fuel and biomass energy by non-polluting zero/lowest carbon energy. [Peter Carter, Canada]	The section has been restructured fundamentally, which means this comment no longer applies. Elements of this text have been retained and used later in this section, consistent with wording approved in the WGIII SPM.
SPM	24	13	24	13	It should be clarified what is meant by "low stabilization levels." Adding GHG after "low" would help. [Government of United Kingdom of Great Britain & Northern Ireland]	Section has been revised fundamentally and comment no longer applies here; where "low stabilisation" is used, it is quantified to give clarity.
SPM	24	13			• SPM [P24 L13] add (430–530 ppm CO ₂ eq); in most integrated modelling scenarios, decarbonization happens more rapidly in electricity generation than in the industry, buildings, and transport sectors [Government of Saudi Arabia]	Section has been revised fundamentally and comment no longer applies here; where "low stabilisation" is used, it is quantified to give clarity. Contribution from different sectors is discussed elsewhere in this revised section consistent with this comment.
SPM	24	14	24	14	"{4.3}" should be deleted, it is already written at the end of the paragraph [Thomas Stocker/ WGI TSU, Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	14	24	16	The content of the sentence is highly suggestive about effectiveness of mitigation options and availability of technologies. Should be remained. [Government of Japan]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	14	24	16	Suggest inserting "particularly" before "in developing countries or ..." because it has not been reported the difficulties of energy service demand reduction are exclusive to developing countries. [Government of Japan]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	14	24	16	The description of "decarbonisation through renewable energy (RE), nuclear power..." should be kept as it is because this part is inevitable to indicate various technologies for decarbonisation. From a viewpoint of the effect of CO ₂ reduction, nuclear power has huge potential and necessary power source. [Hirofumi Kazuno, Japan]	The section has been restructured fundamentally. Given space constraints, we no longer discuss specific mitigation technologies in the SPM, since this would then also require a discussion of their benefits, costs and caveats about implementation.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	14	24	17	Please be more specific here on the risks and maturity of these different technologies, as this general statement doesn't tell anything. As the Table 4.6 on page 114 shows, CCS stands out from the other options in having a wide variety of adverse side-effects and only one single co-benefit, which itself is a bit questionable as a co-benefit (preservation of physical capital in the fossil industry). It has not yet been applied at scale to a large, commercial fossil fuel power generation facility (WGIII, SPM, page 22), and as the WGIII Ch1 one says, "CCS is much discussed as an option for mitigation but not much deployed." (WGIII, Chapter 1, page 12) Furthermore, "Since AR4 studies have underscored a growing number of practical challenges to commercial investment in CCS". (WGIII, Chapter 1, page 12). Nuclear is associated with a long list of risks and barriers, and is in decline (WGIII 7.5.4, 7.8, 7.9, 7.12, Figure TS.19). [Kaisa Kosonen, Finland]	The section has been restructured fundamentally. Given space constraints, we no longer discuss specific mitigation technologies in the SPM, since this would then also require a discussion of their benefits, costs and caveats about implementation. Risk around CCS and BECCS are discussed elsewhere in the SPM already.
SPM	24	14		16	RETAIN: "Energy supply is the largest and fastest growing contributor to global GHG emissions and offers opportunity for decarbonisation through renewable energy (RE), [ADD: and] nuclear power, [REMOVE: and carbon dioxide capture and storage (CCS)]." ADD: CCS cannot contribute to and is not needed for a zero/lowest carbon economy. [Peter Carter, Canada]	Rejected, as this is inconsistent with the WGIII report.
SPM	24	14			• SPM [P24 L14] delete 'energy supply is the largest and fastest growing contributor of global GHG emissions' (this is not true if indirect emissions are accounted for) [Government of Saudi Arabia]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	15	24	15	The authors should insert a footnote stating that renewable energy includes hydropower (and bioenergy?). [Government of United States of America]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	15	24	16	Incomplete enumeration of alternative of mitigation among other mitigation alternatives is prescriptive, please delete "through renewable energy (RE), nuclear power, and carbon dioxide capture and storage (CCS)." [Carlos Méndez, Venezuela]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	15			offers opportunity for decarbonisation through renewable energy (RE), nuclear power, and carbon dioxide - as before, in both cases and/or would be much more policy-neutral .. [Government of Hungary]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	17	24	18	This statement: "In most ambitious long-term mitigation scenarios, the economy is fully decarbonized at the end of the 21st century" is misleading here, as the para talks about electricity sector, which scenarios suggest has to go to zero around mid-century rather than end of century. [Kaisa Kosonen, Finland]	This is discussed in section 3 of the SPM.
SPM	24	17	24	18	Suggest avoiding adjectives such as "ambitious" or aggressive when describing mitigation scenarios since these modifiers imply value judgments. Perhaps this could be rephrased as "In most scenarios with high levels of mitigation ..." [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	17	24	18	Please add to expression "most ambitious" "keeping global temperature rise below 2°C relative to pre-industrial levels" [Government of Germany]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	17	24	19	The authors should clarify the text of this sentence to make it more clear. [Government of United States of America]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	17	24	21	The description of "an associated phase out of freely emitting coal generation" should be deleted. It is not always the case. "Coal without CCS" is NOT phased out in the Figure 7.10 of WG3 Final Draft, for example. [Hirofumi Kazuno, Japan]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	17	24	21	• SPM [P24 L17-21] Delete Line 17-21 [Government of Saudi Arabia]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	18	24	18	Editorial: Add "." after "century" [Government of Norway]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	18	24	18	Please add rest of the sentence (from SYR report) "with many scenarios relying on a net removal of CO2 from the atmosphere." after "...at the end of the 21st century". [Government of Finland]	The section has been restructured fundamentally, which means this comment no longer applies. This issue is covered in section 3 of the SPM.
SPM	24	19	24	21	"and an associated phase out of freely emitting coal generation" should be deleted or changed to "reductions of CO2 emissions from coal generation", because total managements are important for decarbonizataion not only for coal. [Keigo Akimoto, Japan]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	20	24	20	Does "freely emitting coal generation" mean "electricity generation from coal without CCS"? In that case maybe better to use that expression [Harold Leffertstra, Norway]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	20	24	21	What does freely emitting coal generation mean? Can we just say: coal generation? [Government of Germany]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	21	24	21	editorial: C02eq should be substituted by CO2eq [Government of Austria]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	21			Referencing 550 ppm here seems out of context since there is no other discussion of atmospheric concentrations nearby. Consider making this a qualitative statement. [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	22	24	22	We suggest including details from chapter 4 page 99-100. Primarily the bold text from transport, buildings, industry and bioenergy, as this is relevant and important for policy makers. [Government of Norway]	The section has been restructured fundamentally, which means this comment no longer applies. Given space constraints, we have been unable to provide the requested detail later in the SPM either.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	23	24	23	We suggest to replace: "... affect ..." by "... reduces ...". [Government of Netherlands]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	23	24	23	Could you give some examples of energy end use sectors in this sentence? [Government of United Kingdom of Great Britain & Northern Ireland]	The section has been restructured fundamentally, which means this comment no longer applies. Given space constraints, we have been unable to provide the requested detail later in the SPM either.
SPM	24	23	24	23	Consider inserting "historically high-demand" after "in the." This more appropriately aligns this mitigation measure with the goal of balancing "free market" and social equity concerns. [Carl Southwell, United States of America]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	23	24	33	Energy demand and energy service demand are not clearly differentiated here. It is suggested to add "Energy" before 'Demand' at the beginning of the sentence in Line 23. Equally, on P96 L28 of the Synthesis Report Energy should be added before Demand. [Government of China]	The section has been restructured fundamentally, which means this comment no longer applies. Space constraints in the SPM mean that this level of detailed cannot be covered here.
SPM	24	23	24	33	This paragraph on demand reductions should be placed before the para energy supply side options, to indicate the order of importance. [Kaisa Kosonen, Finland]	The section has been restructured fundamentally, which means this comment no longer applies. We see insufficient justification to give a priority ranking to specific mitigation options as both are necessary.
SPM	24	23	24	33	This paragraph (copy-past from SYR page 96 lines 28-38) is already partially cited in the box at the beginning of the page. Part of it is thus redundant. [Thomas Stocker/ WGI TSU, Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies. We have tried to ensure that summary findings do not duplicate the greater detail that follows.
SPM	24	23	24	33	This information is very relevant, but current wording is not very reader friendly (i.e., a long list spanning 8 lines in one sentence). Suggest rewording for clarity and impact. Suggest making clear upfront that achieving demand reductions can help mitigate a range of risks and help maintain policy flexibility in other areas. [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	23	24	33	I agree very much but one counter argument is that efficiency increases will be "taken back" through rebound effects. The argument would be stronger if that could be addressed as well. [Helmut Haberl, Austria]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	24	24	24	"{4.3}" should be deleted, it is already written at the end of the paragraph [Thomas Stocker/ WGI TSU, Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	24		32	These impacts of demand reduction would be easier to digest as a bulleted list [Government of Ireland]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	26	24	27	"(Figure SPM...)": No correspondent figure is presented in the SPM. [Government of Japan]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	27	24	27	Editorial issue: Missing a figure reference number in "... (Figure SPM...)" [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	27	24	27	The reference to the figure is incomplete. [Government of Belgium]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	27	24	27	It seems that "...or potentially premature retirement of..." should be "or results in potentially premature retirement of..." Without this or a similar change the meaning seems to be the opposite of intended. [Government of United States of America]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	27			Item 3) is not sufficiently clear. It would help to note the conditions under which it might be true (eg rising energy demand and carbon-intensive new infrastructure the cheapest option). [Government of New Zealand]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	27			Regarding the phrase "premature retirement of carbon-intensive infrastructures", might this not be a positive step for mitigation efforts? If so, the sentence needs to be reworded for clarity. [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	28	24	29	"since the number of co-benefits for energy end uses measures outweighs the adverse side effects which is not the case for all supply side measures" is difficult to understand. Please be more specific/clear. Furthermore, it is not clear where this statement is corroborated in the rest of the report [Government of Netherlands]	The section has been restructured fundamentally, which means this comment no longer applies. Wording has been revised where it is used.
SPM	24	28	24	29	considering it is now seen to be green to burn trees and biomass heating is also considered a low to zero carbon solution - I am wondering how deforestation will be reduced as there appears to be no forestation strategy at present to deal with biomass burning. The current RHI that has just commenced in the UK is only going to exaggerate deforestation without a suitable forest management strategy [Jason Fitzsimmonz, England]	The section has been restructured fundamentally, which means this comment no longer applies. This level of detail is beyond the scope of the SYR let alone its SPM.
SPM	24	30			Unclear what type of transformation the authors are talking about. Is it technological, energy, or even socio-economic? [Government of Netherlands]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	31	24	32	Change suggested to the sentence: "However, energy service demand reduction, although generally desirable in developed countries, may be unlikely or even incompatible with the right to development in developing countries or for poorer population segments whose energy service levels are low or partially unmet." [Pedro Alfredo Borges Landáez, Venezuela]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	31	24	32	It is not clear what "energy service" is exactly. [Government of New Zealand]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	31	24	33	The difficulty to reduce service demands is not only for developing countries but also for developed countries. Therefore, add "particularly" before the "in developing countries or ..." [Keigo Akimoto, Japan]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	31	24	33	The authors should consider adding "6) Promote and encourage behavioral changes that result in reduction of energy demand for buildings." prior to "However,...." [Government of United States of America]	The section has been restructured fundamentally, which means this comment no longer applies. The importance of behavioral change is now clearly flagged elsewhere in the revised SPM.
SPM	24	31	24	33	It is important to consider the inclusion of reference to the right for development as a reason not to reduce energy demand in developing countries. Reduction of energy demand could not even be desirable in some developing countries due to the right to development and poverty eradication. [Government of Venezuela]	Reference to links to sustainable development is made elsewhere, drawing on the way it is presented in the underlying WG reports and their SPMs.
SPM	24	31	24	33	"...unlikely in developing countries or for poorer populations..." --- Developing countries is a large group, their economies, GDP, etc. are very diverse. We suggest to delete "in developing countries or". [Government of Russian Federation]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	31		33	"However, energy service demand reductions are unlikely in developing countries or for poorer population segments whose energy service levels are low or partially unmet.{4.3}" - it is a rather sensitive issue and clearer formulation would be needed, e.g.: ... are unlikely in developing countries which energy service levels are low or for poorer population segments whose energy service levels partially unmet. [Government of Hungary]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	32	24	33	Suggest to change this sentence to. "However, energy demand reductions are unlikely in developing countries or for poorer population segments whose energy demands are low and energy needs partially unmet" [Harold Leffertstra, Norway]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	32	24	33	for poorer population segments whose energy service levels are low or partially unmet. -> Need to add 'and who do not have access to electricity', since ensuring access to electricity is most important. [Government of Republic of Korea]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	35	24	35	For clarity for non-experts, perhaps the acronym "AFOLU" could be spelled out, in this paragraph where it first appears. It is now only spelled out in the text belonging to a figure in a later part of the document (figure 1.5) [Government of Sweden]	AFOLU is no longer used here.
SPM	24	35	24	35	Since the acronym "AFOLU" first appears here, it should be fully spelled. [Government of Japan]	AFOLU is no longer used here.
SPM	24	35	24	35	AFOLU? Could this be spelt out? [Keith Shine, United Kingdom]	AFOLU is no longer used here.
SPM	24	35	24	35	The abbreviation "AFOLU" should be explained (first use on the SPM here) [Thomas Stocker/ WGI TSU, Switzerland]	AFOLU is no longer used here.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	35	24	35	First mention of AFOLU. Please explain. As mentioned previously, the use of FOLU and AFOLU was strong point of confusion in discussions about WGIII. [Government of Canada]	AFOLU is no longer used here.
SPM	24	35	24	35	Please spell out AFOLU. [Government of Belgium]	AFOLU is no longer used here.
SPM	24	35	24	35	AFOLU - please spell out. [Government of United States of America]	AFOLU is no longer used here.
SPM	24	35	24	35	Note that AFOLU sources in one of the earlier plots was called 'FOLU'. The authors need to make sure they are clear in what is meant and with footnotes, explain usages. [Government of United States of America]	AFOLU is no longer used here.
SPM	24	35	24	35	AFOLU needs to be defined for the reader. [Government of United States of America]	AFOLU is no longer used here.
SPM	24	35	24	35	Acronym AFOLU has not been defined. [European Union]	AFOLU is no longer used here.
SPM	24	35	24	35	The abbreviation 'AFOLU' is used first time without any deciphering on page 24, line 35. Please, provide (just move it from page 38, lines 6 and 7). [Government of Russian Federation]	AFOLU is no longer used here.
SPM	24	35	24	35	What is AFOLU? [Peter Thorne, Norway]	AFOLU is no longer used here.
SPM	24	35	24	37	These two sentences about AFOLU can not seem to be found in {4.3} as suggested by the line of cite on line 40, which is especially important for the (high confidence) statement. This statement can not be found at all in the SYR [Thomas Stocker/ WGI TSU, Switzerland]	The wording has been revised where it applies, consistent with the revised Topic 4 and underlying WGIII report.
SPM	24	35	24	40	The whole paragraph lacks details. It could be improved by using the wording from page 101: "The most cost-effective mitigation options in forestry are reducing deforestation, afforestation, and 5 sustainable forest management. In agriculture, the most cost-effective mitigation options are cropland management, grazing land management, and restoration of organic soils (medium evidence, high agreement).. The economic mitigation potential of supply-side measures is estimated to be 7.2 to 11 GtCO ₂ eq/year in 2030 (at <100 USD/tCO ₂ eq), about a third of which can be achieved at a <20 USD/tCO ₂ eq (medium evidence, medium agreement). Demand-side measures, such as changes in diet and reductions of losses in the food supply chain, have a significant, potential to reduce GHG emissions (0.76–8.6 GtCO ₂ eq/yr by 2050) (medium evidence, medium agreement). {WGIII SPM. 4.2.3} ". [Government of Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies. The level of detail requested is unfortunately not possible to be delivered within the space constraints of the SPM
SPM	24	35	24	40	It is essential to note that AFOLU sources are highly uncertain (esp compared to FF CO ₂), estimated to be +-25% to +-50% for CH ₄ and N ₂ O emissions. AFOLU CO ₂ is not much better. To recommend these without acknowledging the uncertainty in what you are saving is clearly false. WGI notes the high uncertainty in AFOLU sources and should be noted here. [Government of United States of America]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	35	24	40	In my view, the formulation of that paragraph does not do full justice to the complexity of issues at hand in this field. The point is that adaptation and mitigation options that affect land use potentially result in land-use competition, with perhaps substantial trade-offs (or co-benefits) related to very fundamental concerns including food security, ecosystem services, biodiversity, etc. In my view the para needs to be revised to address these concerns much more directly. The main point in my view is that all options that require substantial areas of land face the issue of increasing levels of land-use competition which could have substantial negative repercussions, including increased hunger, GHG emissions from land-use change, loss of C in biota and soils or reduced C inputs to soils (residues), biodiversity loss, etc. [Helmut Haberl, Austria]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	35	24	40	What is meant by cost-effective here? lowest costs? [European Union]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	35		36	RETAIN: "The AFOLU sector plays a key role in low stabilization scenarios because it provides options to remove carbon dioxide from the atmosphere" ADD: Afforestation and stopping deforestation must be included in mitigation. [Peter Carter, Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	35			AFOLU: Spell out this and all other acronyms that are not universally known. The SPM should not only be for climate geeks. [Government of Sweden]	AFOLU is no longer used here.
SPM	24	35			Most people don't know what AFOLU is. [Government of Sweden]	AFOLU is no longer used here.
SPM	24	35			Acronym AFOLU presented for first time with no explanation (first defined on page 38 as part of the caption of Figure 1.5). [Government of Netherlands]	AFOLU is no longer used here.
SPM	24	35			AFOLU should be defined [Government of United Kingdom of Great Britain & Northern Ireland]	AFOLU is no longer used here.
SPM	24	35			• SPM [P24 L35] It is covering AFOLU only from the sink angle. It should cover AFOLU from a mitigation perspective, in particular deforestation and agriculture. [Government of Saudi Arabia]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	35			define AFOLU [Alessandra Conversi, United Kingdom]	AFOLU is no longer used here.
SPM	24	35			This is the first time the acronym "AFOLU" is used in the SPM - so please provide an expansion (in parentheses). Also in some parts of the SPM (e.g. Caption of Fig SPM-3), FOLU is used rather than AFOLU. Is it possible to standardise on one or the other? [David Wratt, New Zealand]	AFOLU is no longer used here.
SPM	24	35			AFOLU not defined; first time used in SPM. Same issue in underlying report; see comments page 37 and 38 regarding use of AFOLU and FOLU acronyms. [Stewart Cohen, Canada]	AFOLU is no longer used here.
SPM	24	36	24	36	Missing ")." after "(high confidence". [Government of Japan]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	36	24	36	Typographical error: missing ")" [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	36	24	36	Write: "(high confidence)". [Government of Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	36			Close the bracket after "confidence". [Government of New Zealand]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	36			A closing parenthesis is missing after "high confidence". Also the font type of the sentence should be in Italic. [Government of Republic of Korea]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	37	24	37	Please add after "...and sustainable development." sentence from SYR report "Direct options in AFOLU involve storing carbon in terrestrial systems and providing bioenergy feedstocks." [Government of Finland]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	37	24	39	I added the words which marked with red: The most cost-effective mitigation options in forestry are afforestation, sustainable forest management and reducing deforestation, improving forest health, rehabilitation, with large differences in their relative importance across regions [Eray Özdemir, Turkey]	The section has been restructured fundamentally, which means this comment no longer applies. The level of detail requested is unfortunately not possible to be delivered within the space constraints of the SPM
SPM	24	37	24	39	These are pretty much all the options in forestry aren't they? Well actually management for timber for long-lived products and bioenergy are not mentioned unless they are part of sustainable forest management. Incidentally, what do you mean by sustainable forest management, one could manage a forest sustainably but actually decrease its mitigation potential compared to e.g. bioenergy forest plantations in the long term. Similarly in the sentence below, cropland management and grazing land management are pretty generic and seem to cover most bases or a huge range of mitigation options. Are these really more cost effective than e.g. behaviour change and encouraging a lower meat diet. Also cost-effective compared to what? would be good to have some idea of mitigation potential and costs of different options for this and energy sector. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The section has been restructured fundamentally, which means this comment no longer applies. The level of detail requested is unfortunately not possible to be delivered within the space constraints of the SPM. A new figure demonstrates the amount of emissions changes in mitigation scenarios compared to baseline.
SPM	24	37	24	39	This paragraph only refers to afforestation, sustainable forest management and reducing deforestation but does not refer explicitly to reducing forest degradation. It may be worth considering to include an explicit reference to this.. [Government of United Kingdom of Great Britain & Northern Ireland]	The section has been restructured fundamentally, which means this comment no longer applies. The level of detail requested is unfortunately not possible to be delivered within the space constraints of the SPM

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	37	24	39	I added the words which marked with red: The most cost-effective mitigation options in forestry are afforestation, sustainable forest management and reducing deforestation, improving forest health, rehabilitation, with large differences in their relative importance across regions [Government of Turkey]	The section has been restructured fundamentally, which means this comment no longer applies. The level of detail requested is unfortunately not possible to be delivered within the space constraints of the SPM
SPM	24	37	24	40	In this case cost effective a generic economic idea that exclude social costs of afforestation. A large quantity of literature (e.g. Smith K., 2007, the carbon neutral myth, offset indulgencies for your climate sins) that show the high social cost of afforestation. Please include a observation to clarify the exclusion of social costs. [Carlos Méndez, Venezuela]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	37		39	Scenarios reaching these concentrations by 2100 include 40% to 70% reductions in GHG emissions by 2050 relative to 2010, and those with more modest reductions are characterized by higher overshoot ($>0.4 \text{ Wm}^2$) and substantial reliance on CDR technologies. An addition to this comment, that at this time there are few proven techniques for CDR, and potentially none for mass scale CDR, would be helpful to focus policy makers on areas of development that require immediate financial support. [Harold David Tattershall, United States of America]	Issues around CDR are flagged in section 3 of the SPM, with details provided in Box 3.3.
SPM	24	38	24	38	"afforestation" should be replaced with "afforestation/reforestation" [Chaozong Xia, China]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	39	24	39	After across regions to include: Policies governing agricultural practices and forest conservation and management are more effective when involving both mitigation and adaptation. [Government of Bolivia]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	39	24	40	Write: "In agriculture, the most cost-effective mitigation options are carbon sequestration by means of improved cropland management, grazing land management, and restoration of organic soils.". [Government of Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	39	24	40	[Government of Switzerland]	Empty comment?
SPM	24	40	24	40	Organic soils ???? You mean Soil organic content [Government of India]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	40	24	40	To include: sustainable management of forests. [Government of Bolivia]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	41			<ul style="list-style-type: none"> • SPM [P24 L41] Re Insert Bioenergy can play a critical role for mitigation, but there are issues to consider, such as the sustainability of practices and the efficiency of bioenergy systems (robust evidence, medium agreement) Barriers to large-scale deployment of bioenergy include concerns about GHG emissions from land, food security, water resources, biodiversity conservation and livelihoods. The scientific debate about the overall climate impact related to landuse competition effects of specific bioenergy pathways remains unresolved (robust evidence, high agreement). (from WGIII SPM page 28, second paragraph) [Government of Saudi Arabia] 	Issues around large-scale deployment of bioenergy are flagged in section 3 of the SPM, with details provided in Topic 3 and Box 3.3.
SPM	24	42	24	42	Systemic cross-sectoral approaches -> Change 'Systemic' to 'Systematic'. [Government of Republic of Korea]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	42	24	42	"systemic cross sectoral" this is efforts that simultaneously provide benefits in more than 1 sector? [Government of United States of America]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	42	24	44	• SPM [P24 L42-44] delete and starts with Human settlements [Government of Saudi Arabia]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	42	24	48	The content of this paragraph can not be found in {4.3} as suggested by the line of cite on line 48 [Thomas Stocker/ WGI TSU, Switzerland]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	42	24	48	The concluding paragraph under the bolded statement "Systemic cross-sectoral approaches to mitigation are expected to be more cost-efficient and more effective in cutting emissions than a focus on individual technologies and sectors" does not appear to be consistent with the conclusion from the WGIII SPM. In the SPM (p.20-21 lines 40-8) that statement is linked to the AFOLU sector - to reduce GHG emission intensity of energy supply sector, switch to low carbon energy carriers and reduce demand in end-use sectors. In the SYR, conclusions relate to mitigation in urban areas to increase accessibility, promote land-use mix, and reduce urban sprawl. In addition, the underlying chapter referred to in the SYR does not appear to support the conclusions either. Needs review. [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	44	24	44	Since most of the world's urban areas in 2030 have not yet been built,' This sounds odd to me. The sizes of existing metropolitan areas are going to expand by 2030 but only few new urban areas are likely to be developed from scratch. [H-Holger Rogner, Austria]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	44	24	45	Based on what type of evidence the auhtor claims that most of the world's urban areas in 2030 have not yet been built? [Vahid Mojtahed, Italy]	The section has been restructured fundamentally, which means this comment no longer applies.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	44	24	45	Is it really correct that most (i.e. >50%) of the urban area expected to exist in 2030, i.e. in 26 years, is still to be built? I know urban expansion is progressing fast, but that seems a bit too much, pls double-check; perhaps provide explanation which scenario forecasts such an explosion of built-up space. [Helmut Haberl, Austria]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	44			On line 44, suggest inserting "that will exist" before "in 2030". [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	45	25	42	This section should address mitigation measures and policies. There is a lot in this section on adaptation, this should be covered elsewhere. [Government of Netherlands]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	45			On line 45, consider replacing the term "spatial planning " with "urban planning" or "urban land use planning", as the term spatial planning is not commonly understood/used outside of Europe. [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	46			On line 46, insert "greatest" before "potential". [Government of Canada]	The section has been restructured fundamentally, which means this comment no longer applies.
SPM	24	49			• SPM [P24 L49] Insert a paragraph on non-CO2 GHGs as well as sinks [Government of Saudi Arabia]	The role of non-CO2 gases is covered in section 3, and the role of sinks covered later in the revised section.
SPM	24	50	24	50	Section 4.2 contains also information on Adaptation, which should be reflected in the section heading. [Government of Sweden]	The section has been restructured fundamentally, which means this comment no longer applies. The revised section does discuss adaptation and mitigation policies together as requested.
SPM	24	50	25	43	Title of subsection and text do not seem to match. While the subsection is titled "Mitigation policies", not only mitigation issues, but also the underlying paragraphs discuss adaptation-related technology development, deployment and diffusion and financing needs and gaps associated with adaptation. Request change of title or revision of text to match title. [Government of Japan]	Section has been revised fundamentally based on this and many other comments.
SPM	24	50	25	43	This section should address policies, but fails to do so. Policies are critical to make the necessary change happen. We suggest to use text from WGIII SPM 5.1. Among these we would envisage: "Since AR4 there has been an increased focus on policies designed to integrate multiple objectives." and several others. [Government of Netherlands]	Section has been revised fundamentally based on this and many other comments.
SPM	24	50	25	43	It is noted that barriers to mitigation are not addressed at all although they must be significant - as demonstrated by the continuing increase in global GHG emissions. It would be policy relevant to identify those barriers as well as policies how to overcome those. [Government of Austria]	Section has been revised fundamentally based on this and many other comments.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	50			Section 4.2: This section is often about both mitigation and adaptation (e.g. pg 25 lines 13-14 and lines 29-30). Consider renaming this section Mitigation and Adaptation Policies, and moving it to after the section on Adaptation Measures. Also consider merging it with section 4.4. on interactions with sustainable development much of which is about the role of climate policies in fostering sustainable development. [Government of Canada]	Section has been revised fundamentally based on this and many other comments.
SPM	24	50			Although the title of this section is "Mitigation policies", adaptation policies are also discussed in this section (page 25, line 7, lines 13-18 and lines 29-36); suggest that a change of title for this section be considered to 'Mitigation and adaptation policies'; also suggest that the order be changed, so that this section be placed after 4.3 - Adaptation measures. [Stewart Cohen, Canada]	Section has been revised fundamentally based on this and many other comments.
SPM	24	50			Section 4.2. This section has to be coherent with sections "2. Approaches to climate change mitigation" and "5.2 International Cooperation" of the SPM of the Contribution Working Group III to the AR5, for its potential political implications, the language used in the SPM of WGIII would be more adequate to avoid prescriptiveness. [Government of Brazil]	Section has been revised fundamentally based on this and many other comments, and draws as much as possible on approved wording from the SPMs of both WGII and WGIII.
SPM	24	52	24	52	It is unclear what it means for policies to increase. What aspect has increased? The number of jurisdictions that have implement such policies, or the amount of direct or indirect financial support, or some other factor that is being influenced by policy? Suggest clarifying. [Government of Canada]	Section has been revised fundamentally based on this and many other comments.
SPM	24	52	24	52	Should this be a bolded finding? [Government of United States of America]	Section has been revised fundamentally based on this and many other comments.
SPM	24	52	24	53	These statements are contradicting with the statement made earlier in page 8 line 7 to line 11 and the statement in section 1.3 of Topic 1, Page 34, Line 7 to line 11 [Government of United Republic of Tanzania]	We don't think they are contradictory, they just show that policies have not been effective in reducing emissions enough; this is made clearer in the revised SPM.
SPM	24	52	24	54	• SPM section 4.2 [P24 L 52 54] correct it as Since the AR4Policies to reduce GHG emissions or to support low-GHG technologies have increased, with a focus on focus on policies designed to integrate multiple objectives, increase co-benefits and reduce adverse side-effects (as stated in WGIII SPM page 28) [Government of Saudi Arabia]	Section has been revised fundamentally based on this and many other comments.
SPM	24	52	24	56	The content of this paragraph can not be found in {4.5} as suggested by the line of cite on line 56. Some part of this paragraph are more or less in section {4}, but the statement "In many countries the policies have helped to reduce emission intensity" can not be found in the SYR. BTW, is this statement consistent with SPM page 25 lines 9-11? [Thomas Stocker/ WGI TSU, Switzerland]	Section has been revised fundamentally based on this and many other comments.
SPM	24	52	24	56	This paragraph mixes many points. The point about integrating climate objectives with other objectives could be developed further. [Government of India]	Section has been revised fundamentally based on this and many other comments.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24	52	25	43	Figure 4.5 including preceeding text paragraph from SYR-110/111 should be lifted into section 4.2 of the SPM. [Jochen Harnisch, Germany]	We felt that this would give too much emphasis on only one particular aspect of climate change responses. The importance of finance is discussed in the revised SPM.
SPM	24	52	25	43	Suggest that a box listing examples of mitigation policies and measures at global and national level which have worked or contributed to GHG mitigation - under UNFCCC in OECD and non-OECD countries etc. [Government of India]	Too much detail for space constraints of SPM.
SPM	24	52	25	52	Please rephrase sentence to: Policies to reduce GHG emissions or to support low-GHG technologies, encompassing regulatory policy, policy incentives and information policies have increased since the AR4. Justification: The paragraphs below only zoom in on certain additive policies that go beyond these typical core components of enabling environments. In the current form, the reader is left with the impression that technology push and pull instruments are the only types of policies that matter in this context. [Government of Germany]	Section has been revised fundamentally based on this and many other comments.
SPM	24	52		53	Policies to reduce GHG emissions or to support low-GHG technologies have increased since the AR4. In many countries these policies have helped to reduce emission intensity. This comment, though valid, fails to acknowledge that irrespective of the commendable efforts by some, overall GHG emissions continue to increase year-on-year, with little sign of moderating. [Harold David Tattershall, United States of America]	Section has been revised fundamentally based on this and many other comments.
SPM	24	53	24	53	Suggested to replace "[...] to reduce emission intensity." with "[...]to reduce carbon [or GHG, whatever more suitable] emission intensity." [Tabaré Arroyo Currás, Mexico]	Section has been revised fundamentally based on this and many other comments.
SPM	24	53	24	53	to reduce emission intensity -> need to change to 'carbon intensity or GHG intensity' (since line 52 refers to policies on reducing GHG, rather than energy.) [Government of Republic of Korea]	Section has been revised fundamentally based on this and many other comments.
SPM	24	53	24	53	Suggest avoiding adjectives such as "ambitious" or aggressive when describing mitigation scenarios since these modifiers imply value judgments. This statement would be just as informative if "Ambitious" were deleted. [Government of Canada]	Accepted. Section has been revised fundamentally based on this and many other comments.
SPM	24	53	24	53	The authors should defined what is meant by "emissions intensity" when it is used here for the first time. [Government of United States of America]	Section has been revised fundamentally based on this and many other comments.
SPM	24	53			"Emission intensity"? CO2 per unit GDP? CO2eq per unit GDP? Or something else? [Government of Sweden]	Section has been revised fundamentally based on this and many other comments.
SPM	24	56	24	56	We suggest including details from chapter 4 page 107-108. Most important content of lines 50-55(page 107) and 1-17(page 108). [Government of Norway]	Too much detail for space constraints of SPM.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24		25		Nowhere in 4.2 is there explicit discussion of co-benefits although this is clearly an important theme on mitigation from the WG3 report. [Government of India]	Accepted. We have included some discussion with reference to co-benefits from mitigation actions.
SPM	24		27		It is strongly suggested to include in the SPM figure 3.5 from page 87. [Government of Austria]	Although this figure has not been included, the importance of climate-resilient pathways has been highlighted at the level of the overall section 3 headline statement within the summary for policymakers. Within section 4, integrated responses are featured in section 4.5.
SPM	24				would help to limit the discussion of mitigation measures to the 2 degree scenarios and spend more effort at clarifying decarbonisation strategies for the various sectors; very important to draw conclusions about incompatibility of new unabated coal plants with a 2 degree pathway (see http://www.europeanclimate.org/documents/nocoal2c.pdf) [Government of Netherlands]	Too much detail for space constraints of SPM.
SPM	24				Emission from international aviation and maritime is expected to be increased rapidly and ICAO and IMO has responsibilities to set international framework. ICAO General Assembly on September 2013 adopted Carbon Neutral Growth, which is cap the emission in 2020. There are good outcomes and I recommend to add some explanation here. [Takashi Hongo, Japan]	Rejected, as this is inconsistent with the WGIII report.
SPM	24				• SPM [P24] Re insert GHG emissions from energy supply can be reduced significantly by replacing current world average coal-fired power plants with modern, highly efficient natural gas combined-cycle power plants or combined heat and power plants, provided that natural gas is available and the fugitive emissions associated with extraction and supply are low or mitigated (robust evidence, high agreement). Carbon dioxide capture and storage (CCS) technologies could reduce the lifecycle GHG emissions of fossil fuel power plants (medium evidence, medium agreement) [Government of Saudi Arabia]	Too much detail for space constraints of SPM.
SPM	24				• SPM [P24] delete Line 23-33, [Government of Saudi Arabia]	Section has been revised fundamentally based on this and many other comments.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	24				<p>• SPM [P24] Re insert Some mitigation policies raise the prices for some energy services and could hamper the ability of societies to expand access to modern energy services to underserved populations (low confidence). These potential adverse side-effects can be avoided with the adoption of complementary policies (medium confidence). Most notably, about 1.3 billion people worldwide do not have access to electricity and about 3 billion are dependent on traditional solid fuels for cooking and heating with severe adverse effects on health, ecosystems and development. Providing access to modern energy services is an important sustainable development objective. The costs of achieving nearly universal access to electricity and clean fuels for cooking and heating are projected to be between USD 72 to 95 billion per year until 2030 with minimal effects on GHG emissions (limited evidence, medium agreement). A transition away from the use of traditional biomass and the more efficient combustion of solid fuels reduce air pollutant emissions, such as sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and black carbon (BC), and thus yield large health benefits (high confidence). (WGIII SPM page 32 para 2) [Government of Saudi Arabia]</p>	Too much detail for space constraints of SPM.
SPM	25	1	25	1	For consistency this should be moved up to before the paragraph which currently precedes it on p. 24 [Peter Thorne, Norway]	Rejected. The discussion on policies and international cooperation should come after the discussion on response options
SPM	25	1	25	1	This shaded text refers to page 106, line 8-12, and concerns the need for international cooperation. We believe that the UNFCCC platform could also be mentioned here. Please consider to include the sentence from line 9-10 on page 106. [Government of Norway]	Noted. The section covers policies and measures at different scales, including at the international level. Thus, the headline has been rephrased to reflect the fact that responses depend on policies and measures across multiple scales. We hope this broadens the message of the headline statement.
SPM	25	1	25	1	Suggested to replace whole chapeau with "Effective climate change mitigation will not be achieved if individual countries advance their own interests independently. Climate change has the characteristics of a collective action problem at the global scale, and therefore requires international cooperation" [Tabaré Arroyo Currás, Mexico]	Accepted. Following the headline statement, the chapeau is rephrased to capture the essence of what the reviewer is suggesting.
SPM	25	1	25	1	The first part needs to read: "As a global commons problem IN AN UNEQUAL WORLD, ..." (add text in CAPS). The problem is not only of the global common, but effective mitigation must address that the world is not homogeneous. Both aspects require international cooperation, as outlined in ch 13 of WGIII. [Government of South Africa]	Rejected. The headline has been rephrased to be consistent to SPM language.
SPM	25	1	25	1	Add line of cite to {4.5.1.1} [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	1	25	1	The term "global commons problem" was a point of confusion in discussions about WGII. Suggest this statement could be revised to simply begin with "Effective ...". [Government of Canada]	Accepted. The headline has been rephrased to reflect the fact that responses depend on policies and measures across multiple scales. We have also ensured the language is consistent with the SPM.
SPM	25	1	25	1	"As a global commons problem" does not translate well. Suggest: As a problem requiring collective action at the global scale. [Government of United Kingdom of Great Britain & Northern Ireland]	Accepted. The headline has been rephrased to reflect the fact that responses depend on policies and measures across multiple scales. We have also ensured the language is consistent with the SPM.
SPM	25	1	25	1	Although clear and appropriate (consistent with ensuing text), the headline may read as incomplete; consider briefly expanding, to capture more of the underlying content. [Government of United States of America]	Section has been revised fundamentally based on this and many other comments.
SPM	25	1	25	1	The authors need to replace the phrase "global commons problem" with the final language used in WGIII SPM, "climate change has the characteristics of a collective action problem at the global scale." [Government of United States of America]	Accepted.
SPM	25	1	25	1	I agree, but a similar formulation has resulted in dramatic difficulties in the approval process. Perhaps it is possible to convey that message with less controversial language? [Helmut Haberl, Austria]	Accepted. The headline has been rephrased to reflect the fact that responses depend on policies and measures across multiple scales. We hope this broadens the message of the headline statement.
SPM	25	1	25	1	This statement seems to be not coherent with a statement on page SYR-80, line 1 (Meeting deep reductions would require building effective global and national institutions. It is unlikely that effective global institutions without effective national institutions could deliver deep GHG emission reductions. Therefore the text in the SPM should be changed accordingly. [Government of Austria]	Accepted. The headline has been rephrased to reflect the fact that responses depend on policies and measures across multiple scales. We hope this broadens the message of the headline statement.
SPM	25	1	25	1	As a global commons problem, effective climate change mitigation requires international cooperation [Government of Bolivia]	Rejected. It is not clear what the reviewer is asking here. Nevertheless, the headline has been rephrased to reflect the fact that responses depend on policies and measures across multiple scales. We hope this broadens the message of the headline statement.
SPM	25	1	25	18	The text on international cooperation is not informative and we suggest to delete it. [Government of Netherlands]	Section has been revised fundamentally based on this and many other comments.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	1			The "subtitle" highlights importance of international co-operation, only, on for the effectiveness of mitigation. However the paragraphs starting on lines 13 and 20 show the importance of technology development and lifestyle change respectively. Consider revising title to "As a global common problem, effective climate change mitigation requires development and dissemination of technologies, lifestyle choices and international cooperation". [Government of Netherlands]	Noted. The headline has been rephrased to reflect that responses depend on policies and measures across multiple scales. There is another section dealing specifically with technologies and lifestyles.
SPM	25	1			The sentence does not deliver any message to decision makers and stays behind key scientific findings. The headline statement should therefore be supported by a second one from the SYR P 73 L 34-37: "Because the damage done by each country's emissions of greenhouse gases is distributed across the world and continues for generations, climate change raises issues of intergenerational, intragenerational and procedural justice and equity, many of which are subsumed under the goal of sustainable development." [Government of Germany]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	3	25	11	• SPM [P25 L3-11] The original text of WG II, Ch. 1, p. 22 is as follows: Linkages among regional, national, and sub-national programs may complement international cooperation. We should take the section SPM.5.2 of WGIII as it is, with no change and no addition. [Government of Saudi Arabia]	Noted. Good suggestion. The section has been revised fundamentally based on this and many other comments.
SPM	25	3			"main multilateral forum" main multilateral instrument [Government of Hungary]	Rejected. 'forum' is consistent with SPM language.
SPM	25	4	25	4	with nearly universal participation -> need to delete 'nearly' as 195 countries are participating currently. [Government of Republic of Korea]	Rejected. This is consistent with SPM language.
SPM	25	4	25	5	This statement about other (non-UNFCCC) institutions reads negatively (i.e., they "result in diversifying international climate change cooperation"). The authors should re-phrase to highlight the amplifying and/or synergistic effects these other institutions can - and do - have, as well. [Government of United States of America]	Noted. The headline has been rephrased to reflect that responses depend on policies and measures across multiple scales.
SPM	25	5	25	7	Policy linkages among regional, national, and sub-national climate policies offer potential ... benefits. -> Argument too strong considering only a medium evidence and medium agreement. [Government of Republic of Korea]	Rejected. Wording 'potential' was included to reflect levels of medium agreement.
SPM	25	5	25	7	How can this statement possibly be characterized as "medium agreement"? Especially with the sentence possessing the caveat that the benefits are only "potential benefits." [Government of United States of America]	Rejected. Finding has been pulled word for word from approved language in WG Iii SPM. WG III author team found only medium agreement amongst the experts, some believing more strongly in potential benefits, others being more skeptical.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	7	25	8	Meaning of linkages could be made clearer in the sentence: 'Linkages can be established between national policies, various instruments, and through regional cooperation'. This reflects a general weakness with WGIII regarding the role and instruments of international cooperation. [European Union]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	7			Be more specific about linkages, not only state that they "can" be established. Maybe they should be established. [Government of Netherlands]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	7			"Linkages" or rather "synergies"? [Government of Germany]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	9	25	27	The authors should consider deleting this text and paragraphs as they provide little value and the adaptation and mitigation sections of this report could be condensed and simplified. [Government of United States of America]	Noted. The section has been revised fundamentally based on this and many other comments. The paragraphs have been organized better along themes.
SPM	25	10	25	10	Suggested to reconsider the word "inadequate evidence". Given context, "insufficient evidence" seems to be more plausible. [Tabaré Arroyo Currás, Mexico]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	10	25	10	replace "impacts on emissions" with 'effects in reducing emissions" [Government of South Africa]	Noted. Adjusted to reflect this concern.
SPM	25	10	25	10	does (high agreement, medium evidence) need to be added after AR4? (see SYR page 107 lines 46-48) [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.
SPM	25	10	25	10	SPM appears to internally contradict: Statement of "inadequate evidence to assess [plans' and strategies] impacts on emissions" conflicts with immediately preceding claim that "these policies have helped to reduce emission intensity" (p. 24, l. 53). [Government of United States of America]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	10			Suggest addition "and recurring evaluation" after "coordination" [Government of Sweden]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	11	25	11	add {4.5.1.1} to the line of cite. Otherwise 4.5.1.2 should be changed to 4.5.1 in order to limit references to second level subsections only. The first part of the paragraph comes from 4.5.1.1 (copy-paste of SYR page 106 part of lines 25-29 and SYR page 107 lines 32-34) [Thomas Stocker/ WGI TSU, Switzerland]	Relevant reference was deleted in rewrite.
SPM	25	13	25	13	can be important components -> can and 'should' be important components. Without a technological breakthrough, achieving mitigation is difficult in the long run. [Government of Republic of Korea]	Noted. The section on technology development and transfer highlights the significant importance of technological developments and building capability for mitigation.
SPM	25	13	25	13	To include the following wording in red: Transference of technology, technology development, deployment and diffusion [Government of Bolivia]	Noted. The ideas embedded in the suggested statements have been captured in the section relating to technology development and transfer.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	13	25	18	This paragraph lacks a discussion on technology transfer-related policies. As an important concern in the field of mitigation and adaptation measures, technology transfer-related policies have effectively boosted countries' participation in international cooperation on climate change. It is suggested to make an appropriate reformulation based on ES of WG III Chapter 13 – "Technology policy can help lower mitigation costs, thereby increasing incentives for participation and compliance with international cooperative efforts, particularly in the long-run. Equity issues can be affected by domestic intellectual property rights regimes which can alter the rate of both technology transfer and the development of new technologies. [13.3, 13.9, 13.12]". [Government of China]	Noted. The ideas embedded in the suggested statements have been captured in the section relating to technology development and transfer.
SPM	25	13	25	18	Before emphasizing transfer of adaptation technology, transfer of mitigation technology need to be emphasized and discussed. [Government of Republic of Korea]	Rejected. The discussion on adaptation has precedes mitigation throughout the SPM. There is no reason why we should depart from this sequence.
SPM	25	13	25	18	The para mentions only examples relating to public activities. To become more balanced, statements on the private sector should be added. In addition, the last sentence only related to adaptation technologies but applies also to mitigation technologies. [Government of Germany]	Noted. The new section on technology development and transfer captures this request.
SPM	25	13	25	18	It was suitable to mentioned about the impact of technological assistance and diffusion from developed countries to developing countries with less established infrastructure in this paragraph. Many developing countries can construct sustainable infrastructure based on renewable energies if the they get access to the technology and the assistance required for establishing them. [Vahid Mojtabeh, Italy]	Too much detail for space constraints of SPM.
SPM	25	13	25	27	These two paragraphs deal with measures, not policies and are better placed on SPM 24, line 49. [Government of Netherlands]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	13	25	27	Very generic paragraphs, known to policymakers for years from previous policy reports [Government of India]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	13			replace "can be" with "are" [Government of Netherlands]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	14	25	14	"However, they face..." – please, again, explain what/who are "they". [Government of Russian Federation]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	14	25	15	this paragraph needs to rewritten to sound more optimistic and positive as it comes across too negative [Jason Fitzsimmonz, England]	Noted. The section has been revised fundamentally based on this and many other comments.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	15	25	15	(high confidence) should probably be added after "contexts" (see SYR page 110 lines 27-29) [Thomas Stocker/ WGI TSU, Switzerland]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	16	25	16	Editorial issue: Missing an "it" in "...but for adaptation it also includes..." [Government of Canada]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	16	25	16	To include a new paragraph: Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation. In this regard, it is important to promote community-based adaptation approaches. [Government of Bolivia]	Rejected. Too much detail for space constraints of SPM
SPM	25	16	25	18	The text here needs more clarification: mitigation technologies are also often in use elsewhere. [Government of United States of America]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	17	25	18	Change suggested: "technology transfer and enhancement of endogenous capacities and technologies, as adaptation technologies are often familiar and already applied elsewhere but need to be adapted to local circumstances." [Pedro Alfredo Borges Landáez, Venezuela]	Noted. The ideas embedded in the suggested statements have been captured in the section relating to technology development and transfer.
SPM	25	17	25	18	Inclusion after technology transfer "and enhancement of endogenous capacities and technologies". [Government of Venezuela]	Noted. The ideas embedded in the suggested statements have been captured in the section relating to technology development and transfer.
SPM	25	20	25	20	Consider changing "Behaviour, lifestyle and culture" to "Individual and small group behaviour, beliefs and other cultural behaviours, lifestyle, culture and communication." While behaviors can be construed to include beliefs, typically the term belief denotes broad, generally long-term group ritual and tradition more than shorter-term individual and small group conduct and reaction. Also, effective communication is critical as an educational tool. [Carl Southwell, United States of America]	Rejected. 'behaviour, lifestyle and culture' is consistent with SPM language.
SPM	25	20	25	22	Does this statement not apply to energy demand as well? [Government of Germany]	Noted. Yes, the statement also applies to energy demand. This is reflected in the new SPM.
SPM	25	20	25	27	this contains weak statements like "might" and "may be". Thus if it is weak is it necessary. In any case most of it seems to belong better in the previous section [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Noted. The section has been revised fundamentally based on this and many other comments.
SPM	25	20	25	27	In my view, the discussion of consumption patterns should not be subsumed in "lifestyles", i.e. be explicitly mentioned here. [Helmut Haberl, Austria]	Noted. The section has been revised fundamentally based on this and many other comments.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	20			• SPM [P25 L20] delete 'energy use and associated' [Government of Saudi Arabia]	Rejected. The text has moved up to the section dealing with mitigation options. And on the specific discussion on energy, it makes sense to discuss it in the context of associated emissions
SPM	25	21	25	22	To delete the following wording, not agreed at WGII: in particular when complementing technological and structural change. [Government of Bolivia]	Rejected. Text was approved word for word at WG III plenary and is an important component to mention.
SPM	25	23	25	23	Is "might" necessary? It would be hard to imagine a higher-emissions lifestyle that corresponds to reduced energy consumption. [Government of Canada]	Relevant sentence deleted in rewrite for reasons of space.
SPM	25	23	25	24	The sentence, to make sense, should read:" Shifts to more energy and resource intensive lifestyles may contribute to higher emissions and therefore higher mitigation costs." [Government of Sweden]	Relevant sentence deleted in rewrite for reasons of space.
SPM	25	23	25	24	Please delete the statement on shifts toward more emission-intensive life-styles, because this is not relevant information. The SPM of WG3 states: "Emissions can be substantially lowered through changes in consumption patterns (e. g., mobility demand and mode, energy use in households, choice of longer-lasting products) and dietary change and reduction in food wastes." [Government of Germany]	Accepted. Relevant text deleted.
SPM	25	23			• SPM [P25 L23] delete 'energy and' [Government of Saudi Arabia]	Relevant sentence deleted in rewrite for reasons of space.
SPM	25	24	25	25	It would seem relevant to also include energy savings measures/habits among the factors that can reduce the growth in emissions resulting from change in lifestyles - fx the latter part of sentence could read: "..., but emissions can be substantially lowered through changes in consumption patterns, energy savings measures, dietary change and reduction in food wastes." [Government of Denmark]	Accepted. Inserted.
SPM	25	29	25	29	Would it be correct to replace "can require both" with "will require"? Is there uncertainty in the assessment that changes and increases will be required? [Government of Canada]	Relevant text removed in rewrite for reasons of space.
SPM	25	29	25	29	This opening is too vague and not an "assessment". Please revise accordingly. [Government of United States of America]	Accepted. Text revised in rewrite.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	29	25	30	Please rephrase to: "Effective mitigation and adaptation efforts requires changes in patterns of investment in all countries. To achieve this, appropriate and stable enabling environments are necessary encompassing effective regulatory policy (e.g. standards), policy incentives (e.g. financial support or carbon pricing) as well as behaviour and lifestyle changes (e.g. shifts in consumption patterns)." Justification for change: Current sentence is imbalanced. Financial support is only one element of the incentive schemes necessary to shift to low carbon growth. The WG3 SPM therefore also describes a range of different policy measures that can be effective (p. 30-32). Also, financial support is one key element of this policy mix in both developed and developing countries. [Government of Germany]	Partly Accepted. Relevant text reworded to focus strictly on emission reduction, and to exactly reflect WG Iii approved language.
SPM	25	29	25	30	• SPM [P25 L29-30] delete 'in all countries' [Government of Saudi Arabia]	Accepted.
SPM	25	29	25	30	As written, this statement is far too policy prescriptive and inconsistent with the finding from WG3 which stated that changing patterns of investment are needed. The sentence currently reads: "can require...increases in financial support for developing countries." It needs to more accurately reflect the finding from the WG3 SPM. [Government of United States of America]	Accepted. Reworded to exactly reflect WG III approved language.
SPM	25	29	25	30	The current sentence is policy prescriptive but could be made more neutral by revising it to read, "Effective mitigation and adaptation efforts can involve both changes in patterns of investment in all countries and increases in financial flows to developing countries." [Government of United States of America]	Accepted. Reworded to exactly reflect WG III approved language.
SPM	25	29	25	36	Please be more specific here on what are the shifts that need to happen in investment flows. Figure 4.5 on page SYR-111 suggests that for 430-530 ppm CO2eq scenarios there needs to be a massive shift away from fossil fuel extraction and fossil fuel power plants primarily into energy efficiency and renewable energy within the next 20 years. [Kaisa Kosonen, Finland]	Accepted. Text inserted to cover this point.
SPM	25	29	25	36	The main idea is lost in this paragraph. International financing is an obligation not an investment, is part of the provision of the onlyone international regimen of climate change. Besides, there is the ODA Official Development Assistance. [Government of Venezuela]	Rejected. The point of the paragraph is to highlight the investment that would be required to reach ambitious mitigation targets, not to discuss international financing discussed as part of the negotiations.
SPM	25	29	25	43	Mitigation or adaptation of the impact by climate change may be achieved more effectively through economical approach rather than political one. As the effort should be global, the motive for mitigation and adaptation should be economic rather than institutional. (e.g. the institutional control is bound to the political and social conditions of a country or a city while economical one is universal stimulus). As mentioned in page SYR-26 line 11-12 ("The effectiveness of specific adaptation options is influenced by culture, institutions, risk perception, resources and resource entitlement"), we need to find more universal solution to achieve mitigation/adaptation goal. [Young-june Choi, South Korea]	Noted. Authors have taken care to address both global carbon prices, as well as institutional requirements on a more local scale to cover all perspectives.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	29			remove "can" as it makes a sentence ambiguous. [Government of Netherlands]	Relevant text removed in rewrite for reasons of space.
SPM	25	30	25	30	(high confidence) should probably be added after "countries" (See SYR page 110 lines 50-52) [Thomas Stocker/ WGI TSU, Switzerland]	Relevant text removed in rewrite for reasons of space.
SPM	25	30	25	30	Please, replace "developing countries" with "developing regions", see also comment #23 below [Government of Russian Federation]	Relevant text removed in rewrite for reasons of space.
SPM	25	31	25	31	What does large changes mean? Try to be specific if possible. The changes (see WGIII Figure SPM 9) don't seem that dramatic. They are presumably quite undramatic if compared to historic trends and changes in investment patterns. [Government of Sweden]	Accepted. Specific numbers introduced in subsequent sentence.
SPM	25	31	25	33	• SPM [P25 L31-33] correct as 'The public sector along with the private sector ,' [Government of Saudi Arabia]	Rejected. Sentence as appears is approved WG III SPM language, which the authors feel is balanced.
SPM	25	31			How? In what direction? [Government of Sweden]	Accepted. Specific numbers introduced in subsequent sentence.
SPM	25	32	25	32	When putting that private sector along with public sector play in important role on financing mitigation and adaptation, it seems that the private sector would have a greater importance in financing climate change, are we forgetting art 4.3 of the UNFCCC that clearly states that developed country Parties shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations.... [Government of Ecuador]	Rejected. The sentence does not place priority, but simply notes that the private sector can play an important role. There is no discussion of the UNFCCC declarations here.
SPM	25	32	25	32	To delete enabling environment and substitute by appropriate State regulations [Government of Bolivia]	Rejected. Enabling environment can encompass more than state regulations. Text is approved WG III SPM language, and should be maintained.
SPM	25	33	25	34	If there is "limited evidence" (line 33) is there a basis for "medium confidence" (line 34)? Suggest reviewing. [Government of Canada]	Yes, the statement is traceable to the underlying assessment and approved wording in the working group 2 summary for policymakers.
SPM	25	36	25	36	(high agreement-robust evidence) should probably be added after "measure" (See SYR page 110 lines 52-54) [Thomas Stocker/ WGI TSU, Switzerland]	Relevant text removed in rewrite for reasons of space.
SPM	25	38	25	39	Suggest replacing "actions" with "emissions", so that headline more closely reflects underlying text. [Government of United States of America]	Relevant text removed in rewrite for reasons of space.
SPM	25	38	25	43	Bold heading does not match with the contents of subsequent paragraphs. [Government of Republic of Korea]	Relevant text removed in rewrite for reasons of space.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	38	25	43	I am not sure what this paragraph is really contributing. The first sentence seems obvious and also very dependent on the scenario, a weak "can" statement, not worth having in. The second sentence also seems to be stating the obvious, countries with higher emissions have to make most mitigation effort. neither of these statements seem to be about policy. The third statement refers to some studies and is unquantified, what are substantial financial flows, flows from here to where, compared to what, why pick out some studies. [Joanna House, United Kingdom of Great Britain & Northern Ireland]	Relevant text removed in rewrite for reasons of space.
SPM	25	38	25	43	• SPM [25 L38-43] delete as this implies that future mitigation efforts should be in large developing countries. Might be misleading [Government of Saudi Arabia]	Partly accepted. Relevant text removed in rewrite for reasons of space.
SPM	25	38	25	43	The distribution of mitigation goals (and costs) might be conditionally applied at three progressive scales--country-based goals, industry-based goals within country, and company-based goals within industry by country. For example, if country-based emissions goals were met within a given period, then industry- and company-based goals would not apply within that country. If these goals were not met, then industry-based goals would apply within a country until its country-based goals were met. If, within a given period, these goals were still not met, then company-based goals would apply within that country until country-based emissions' goals were met. Enforcement would be similarly progressive--at a country level, carbon trading and monetary assessments reinforced by monitoring; at an industry level, carbon trading and monetary fines; and, at a company level, carbon trading, fines, and, ultimately, the loss of the ability to conduct business and/or criminal charges. [Carl Southwell, United States of America]	Relevant text removed in rewrite for reasons of space.
SPM	25	38		40	RETAIN: "The distribution of mitigation costs [ADD: and benefits] across countries can differ from the distribution of the actions themselves (high confidence). In globally cost-effective scenarios, the majority of mitigation efforts takes place in countries with the highest future emissions in baseline scenarios." (From SPM Table 1: "Cost estimates shown in this table do not consider the benefits of reduced climate change as well as co-benefits [...] of mitigation.") NOTE: The cost-benefit methodology in the SYR is not ethical, is biased toward fossil fuel energy, and is therefore not valid. ADD: According to a modern, ethical cost-benefit assessment, mitigation with low-to-preferably-zero future discounting (Stern 2006) has no significant costs and enormous benefits, increasing over time. [Peter Carter, Canada]	Relevant text removed in rewrite for reasons of space.
SPM	25	39	25	39	add after "globally cost-effective" the words 'and distributionally fair' [Government of South Africa]	Relevant text removed in rewrite for reasons of space.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	40	25	43	The statement on effort sharing frameworks ("Some studies exploring particular effort-sharing frameworks, under the assumption of a global carbon market, have estimated substantial global financial flows associated with mitigation for scenarios leading to 2100 atmospheric concentrations of about 450 to 550 ppm CO ₂ eq.") does not convey a substantial message, please improve. The current statement is not consistent with WG3 SPM 5.1 which states "Substantial reductions in emissions would require large changes in investment patterns. Mitigation scenarios in which policies stabilize atmospheric concentrations (without overshoot) in the range from 430 to 530 ppm CO ₂ eq by 2100 lead to substantial shifts in annual investment flows during the period 2010 – 2029 compared to baseline scenarios [...]." [Government of Germany]	Relevant text removed in rewrite for reasons of space.
SPM	25	42			Financial flows from where to where? [Government of Sweden]	Relevant text removed in rewrite for reasons of space.
SPM	25	45	25	45	In view of being coherent with the text on mitigation, we would like to suggest either to replace the title "adaptation measures" by "adaptation policies and measures" or to add separate titles "adaptation measures" and "adaptation policies" at the appropriate places. [Government of Belgium]	The titles now use parallel wording: response options for adaptation and response options for mitigation.
SPM	25	45	25	52	The section on adaptation measures contains not a single finding on the costs of adaptation, or assesment of the literature on adaptation funding. This important gap must be filled; there is clearly a literature on these matters [Government of South Africa]	A finding on adaptation costs is presented in section 4.4.
SPM	25	47	25	47	The "(high confidence)" statement is not present in the same sentence in SYR-101 line 24, it should be consistent so removed here or added in SYR topic. [Thomas Stocker/ WGI TSU, Switzerland]	The revised headline statement is fully supported by the headline statement in the underlying topic section.
SPM	25	47	25	52	Suggest replacing text in shaded box. At present this is simply duplicating bolded text from the subsequent three paragraphs. One alternate option from approved WGII SPM text would be "Adaptation is place and context specific, with no single approach for reducing risks appropriate across all settings". Note that the phrase "can have multiple and overlapping entry points" works in the WGII SPM because it is linked to Figure SPM.8. Without the supporting visual the phrase is not sufficiently supported. [Government of Canada]	More accessible, concrete, and concise statements are now provided, in concordance with the text that follows, with overlap minimized.
SPM	25	47	25	52	This headline statement is not balanced. The last two sentences are quite negative and the last one is too unspecific. Please mention the importance of vulnerability reduction. [Government of Germany]	A much more concise headline is now provided, with improved balance. The existence of adaptation options across sectors is emphasized, while highlighting the consequences of increasing climate change.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25	47	25	52	Paragraph is 'copy/paste' from several sources. Some sentences are hard to interpret : 'adaptation options can have multiple and overlapping entry points' (what does it really mean?) 'Significant co-benefits ...' is meaningless in isolation from any background. We recommend that this section should start by identifying the categories of adaptation options and overlapping approaches (as identified in table 4.3.) within the portfolio. If not, the text about entry points, tradeoffs etc becomes too abstract. [European Union]	A more streamlined headline statement is now presented for the section, without use of jargon.
SPM	25	47	25	52	This overarching statement needs a comment on limits to adaptation. Can we adapt to >4C of climate change? Probably not in many sectors. This is critical information that needs to be brought to the fore. [European Union]	The relationship between increasing climate change and prospects for some adaptation options is now featured in the headline. Limits to adaptation are further highlighted within sections 2.3 and 3.3.
SPM	25	47	25	53	Redundancy: page 26 line 1, lines 8-9, lines 18-19 (in the next three paragraphs) [Thomas Stocker/ WGI TSU, Switzerland]	Overlap is substantially reduced, with the headline statement streamlined substantially.
SPM	25	47	27	12	The key points in this section lack descriptions on what makes them policy relevant. This section needs more about what this means for policy-making. [European Union]	Policy relevance is better emphasized now, clarifying the focus on the abundant response options for adaptation that are available and reducing jargon substantially.
SPM	25	47			RETAIN: "A first step for adaptation is often to reduce current climate-related [DELETE: risks] [ADD: damages]." [ADD:] Adaptation cannot be assumed to be beneficial without effective ongoing mitigation. The first step in mitigation and adaptation is to stop all subsidies that encourage greenhouse gas pollution, a step that will rapidly and powerfully shift and act to correct the market. [Peter Carter, Canada]	The headline statement has been substantially revised to improve accessibility and conciseness. Complementarity between adaptation and mitigation is addressed most substantially within 3.2 and 4.5, with complementarity here confined to understanding the relationship between increasing climate change and prospects for adaptation.
SPM	25	51	25	51	where are the "transformational responses" defined? And by whom? The notion of more extensive, discontinuous changes needs to be balanced against more incremental changes - in non-normative language. [Government of South Africa]	The phrase is no longer used in this section.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	25				<p>• SPM Section 4.3 [P 25] insert texts associated with Equity from WGII SPM page 24 first paragraph</p> <p>Existing and emerging economic instruments can foster adaptation by providing incentives for anticipating and reducing impacts (medium confidence). Instruments include public private finance partnerships, loans, payments for environmental services, improved resource pricing, charges and subsidies, norms and regulations, and risk sharing and transfer mechanisms. Risk financing mechanisms in the public and private sector, such as insurance and risk pools, can contribute to increasing resilience, but without attention to major design challenges, they can also provide disincentives, cause market failure, and decrease equity. Governments often play key roles as regulators, providers, or insurers of last resort. [Government of Saudi Arabia]</p>	Economic options are featured within table SPM.3.
SPM	26	0			Section 4.4: There is not any formal uncertainty assessment given in this section. [Thomas Stocker/ WGI TSU, Switzerland]	Uncertainty language is now provided throughout 4.5.
SPM	26	1	26	1	As for comment #104, the high confidence statement here is correct if we interpret "current climate-related risks" only as "vulnerability and exposure to present climate variability". Then SYR-110 lines 28-29 justifies having (high confidence) [Thomas Stocker/ WGI TSU, Switzerland]	The statement has been revised accordingly within 3.3.
SPM	26	1	26	1	The sentence lost its main argument on linkages with sustainable development and other. Therefore, please replace with the original sentence from SYR P101 L 28 ff "A first step toward adaptation to future climate change is reducing vulnerability and exposure to present climate variability (high confidence). Strategies include actions with co-benefits for other objectives." This sentence could be added to the headline statement on the bottom of page 25. [Government of Germany]	The full 1st sentence is now provided within 3.3. The broader linkages to sustainable development are emphasized throughout that section, although not with the wording suggested here.
SPM	26	1	26	1	The bolded statement is repetitive and can be deleted - or pared back accordingly. [Government of United States of America]	Overlap is reduced, but note that the statement now occurs in 3.3.
SPM	26	1	26	6	The concepts in this paragraph are important, but suggest they be formulated more clearly and explicitly. [Government of Canada]	Findings on integrated responses are now substantially clarified and presented within 4.5.
SPM	26	1	26	6	This para contains statements on the integrated approach to adaptation that have been previously mentioned, e.g. under section 3.2.. Please shorten the text and improve structure. [Government of Germany]	Overlap between material in this section and other sections has been very substantially reduced.
SPM	26	1	26	14	The authors should consider deleting these two paragraphs as they provide little value and the adaptation and mitigation sections of this report could be condensed and simplified. [Government of United States of America]	Material here has been substantially condensed and focused on the points that are unique to this section.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	26	1	26	46	We support the inclusion of this section in the summary for policy makers, in particular statements regarding adaptation measures that have co-benefits and tradeoffs that reduce the effectiveness of other actions. [Government of New Zealand]	Synergies and co-benefits are emphasized within section 3 and in 4.5, with material here focused and condensed to reduce overlap and to present unique, non-overlapping findings.
SPM	26	4	26	4	"near-term responses..." it sounds like the responses are increasing risk. It would be more clear and accurate to just say the "responses to climate change are increasing the risk..." [Government of United States of America]	This finding is no longer presented here.
SPM	26	4	26	6	This sentence beginning "However, some near-term responses" is key - We suggest making this a new para and making it bold. It is important to highlight the point that if we just focus on the near-term then we could lock-in greater risks in the future. [Government of United Kingdom of Great Britain & Northern Ireland]	This finding is no longer presented here.
SPM	26	5	26	5	"control" or "management" instead of "manipulation"? (manipulation has connotations of dishonest activity, rigging) [Jonathan Lynn, Switzerland]	This comment is misplaced.
SPM	26	5	26	5	Is the intention here to mean "decreasing risks" - instead of "increasing risks"? [Government of United States of America]	This finding is no longer presented here.
SPM	26	8	26	8	What is meant by "ENTRY POINTS"? Please clarify. [Government of United States of America]	The phrase is no longer used here.
SPM	26	8	26	9	please clarify the term "entry points" [Government of Netherlands]	The phrase is no longer used here.
SPM	26	8	26	14	Suggest simplifying this paragraph and focus on the key message. Suggest deleting the first sentence, which is difficult to understand without a supporting figure, and build on the simple, clear message: "Significant co-benefits, synergies, and tradeoffs exist among individual adaptation options." [Government of Canada]	Substantially simplified findings are now presented, with improved focus on points relevant for this section.
SPM	26	8			What is meant by "entry points"? Suggest clarifying. [Government of Canada]	The phrase is no longer used here.
SPM	26	8			not sure what you mean by "entry points" [Joanna House, United Kingdom of Great Britain & Northern Ireland]	The phrase is no longer used here.
SPM	26	11	26	11	Consider inserting "beliefs and other cultural behaviors" after "institutions,". [Carl Southwell, United States of America]	The sentence is no longer included.
SPM	26	13	26	13	"other actions" is too vague. The authors should expand upon what they mean or drop it. [Government of United States of America]	The sentence is no longer included given the improved focus on points relevant for this section.
SPM	26	16	26	46	In this, the adaptation options and measures could be listed in a box for different ecosystems with examples of cross-sectoral and transformational measures [Government of India]	These examples are no longer included within the summary for policymakers.
SPM	26	16	26	46	Weather fore warning, seasonal forecasts, weather based insurance is missing . These are directly related to adaptation to climate change in almost all sectors [Government of India]	These examples are no longer included within the summary for policymakers.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	26	16	26	46	it is important to establish a better relationship between this measures with those proposed in the WGII document for adaptation included in the Assessment Box SPM.2 Table 1. [Government of Bolivia]	These examples are no longer included within the summary for policymakers.
SPM	26	16	26	46	the order of the discussion of the various items should be changed: first, human related issues (food, urban areas and health) should be mentioned, and these should be followed by the others. This is because it is especially policymakers that may capture issues much better if they see that those issues that they are concerned with mostly are regarded as important. [Government of Hungary]	These examples are no longer included within the summary for policymakers.
SPM	26	17	26	18	This statement appears elsewhere as well. Keep only one instance. The other can be deleted. [Government of United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	17	26	28	It seems a little odd that the beginning of this paragraph only says that for ecosystems, adaptation focuses on reducing other pressures, while the bullet points only mentions other measures. Please integrate both elements in a clearer way or provide additional wording that clarifies the role of the bullet points. [Government of Belgium]	These examples are no longer included within the summary for policymakers.
SPM	26	17		19	RETAIN: "For many natural ecosystems, the adaptation options are limited and focus mostly on reducing other pressures. For many human systems, a wider portfolio of options exists [...] but their implementation faces a range of constraints." ADD: Emergency. ADD: This confirms we are beyond dangerous anthropogenic interference (DAI) with the climate system. ADD: "• Increased risk of species extinction. A large fraction of the species assessed is vulnerable to extinction due to climate change. [...] Cascading effects through organism interactions [...] amplify risks (high confidence). 2°C risk, no adaptation: medium" (from p. 68, Table 2.3). [Peter Carter, Canada]	These examples are no longer included within the summary for policymakers.
SPM	26	19	26	19	On "Transformational responses" in the same sense of the comments made before. If there is still difficulties with the definition of transformation, the same difficulties will appear in trying to find solution and answer or "tranformational responses". In example, in Venezuela we are supporting the importance of changing the current model. [Government of Venezuela]	These examples are no longer included within the summary for policymakers.
SPM	26	20	26	21	For freshwater resources there are some methods suggested, e.g. Adaptive management and scenario planning, while for the other issues more concrete things are suggested (eg. Early warning systems, or irrigation). Scenario planning for example could equally well be used for urban areas or human health. [Government of Sweden]	These examples are no longer included within the summary for policymakers.
SPM	26	20	26	46	This list is interesting but I have to wonder whether it is a level of detail appropriate to the SPM. I could see an argument for its deletion as it adds detail to the main bullet and arguably it is solely this main point which should make the SPM. Deletion would shorten the text to be negotiated by a considerable amount (about 3%) [Peter Thorne, Norway]	These examples are no longer included within the summary for policymakers.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	26	20	26	46	The value of this sectoral listing is questionable, and may downplays the complexity of the adaptation process. Suggest that importing Table 4.3 into this section would not take up much more space and would convey more useful information. If retained, this list requires an introductory sentence to explain what this list is conveying. [Government of Canada]	The sectoral listing is no longer included, and instead the table of examples of options has been added, with an appropriate introductory statement.
SPM	26	22	26	23	limited evidence, high agreement – different language than used elsewhere describing confidence intervals. Pleaes consider its usage here. [Government of United States of America]	This statement has been deleted.
SPM	26	23			to add that the lack of robust scientific technical studies detailing the weather behavior at local levels for the implementation of adaptation measures limited evidence of the potential impacts of climate change; however, take into account the evidence and frequency of extreme weather events is substantiated by statistics related with high reliability and associated occurrence beyond the statement of recognized scientific observations consequences. [Government of Nicaragua]	These examples are no longer included within the summary for policymakers.
SPM	26	24	26	28	Role of protected areas should be mentioned here. See for example WGII, TS, table TS.7. [Kaisa Kosonen, Finland]	These examples are no longer included within the summary for policymakers.
SPM	26	26			please change "can reduce" to "help to reduce" [Government of Netherlands]	This example is no longer included within the summary for policymakers.
SPM	26	29	26	32	The finding on "coastal systems and low-lying areas" could benefit by including something about sustainable or "climate smart" development. [Government of United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	29	26	32	The authors should consider adding language on reducing non-climatic stressors in coastal systems and low-lying areas similar to what has been included in the bullet on terrestrial and freshwater systems in lines 24-28 on page 26. [Government of United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	29			please change "can reduce" to "help to reduce" [Government of Netherlands]	These examples are no longer included within the summary for policymakers.
SPM	26	33	26	33	"Forecasting and early warning" of what? Please clarify / be more explicit. [Government of United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	34			please change "can help reduce" to "reduce" to avoid ambiguity [Government of Netherlands]	These examples are no longer included within the summary for policymakers.
SPM	26	37	26	37	Consider inserting ", decreased reliance on monoculture" after "irrigation." [Carl Southwell, United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	39	26	39	The meaning of the term "gender-oriented approaches" is unclear. Consider deleting it, or rephrasing as "access for marginalized populations" or "access for both genders," [Government of United States of America]	These examples are no longer included within the summary for policymakers.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	26	40	26	43	As most people live in urban areas, and this share is increasing, this information is key. Please also consider reflecting the finding in AR5 WGII, Chapter 8, Executive summary: "Urban adaptation action that delivers mitigation co-benefits is a powerful, resource-efficient means to address climate change and to realize sustainable development goals (medium confidence based on high agreement, medium evidence) (8.4)." [Government of Norway]	These examples are no longer included within the summary for policymakers.
SPM	26	43			to add that the lack of systematization of local adaptation experiences, and locate the benefits of urban adaptation to a medium level of confidence. However, with appropriate support from science and technology in climate change to developing countries the level of statistical confidence would be high. [Government of Nicaragua]	These examples are no longer included within the summary for policymakers.
SPM	26	44	26	44	What is meant by the term "security" in this context? Whose security? Where and when? Please clarify. [Government of United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	45	26	45	Suggest clarifying what the delivery systems referred to here deliver (health care?). [Government of Canada]	These examples are no longer included within the summary for policymakers.
SPM	26	45	26	45	Consider inserting ", monitoring vector migration, and preplanning for species' incursions" after "institutions." [Carl Southwell, United States of America]	These examples are no longer included within the summary for policymakers.
SPM	26	47			We suggest to add a statement on the role of science in informed local and national decision making. This requires research capacity and standardised assessment methodologies. (See e.g. WGII 22.7) [Government of Netherlands]	At a broader level, the importance of enhanced capacities are highlighted within 4.1. The requested example is too detailed given page constraints of the summary for policymakers.
SPM	26	48	26	48	To avoid any confusion with the title of section 3.3 I would suggest to substitute this title by "Climate change and sustainable development" or something similar [Maria Carmen Llasat, Barcelona]	Partly accepted. Section has been retitled to read 'Trade-offs, synergies and interactions with SD'
SPM	26	48	27	12	Section 3.5 ('Interactions among mitigation, adaptation, and sustainable development') is covered in SPM 4.4 instead of chapter 3 of the SPM. We suggest to move this section to SPM section 3 as to retain the same structure as the underlying text. [Government of Netherlands]	Rejected. Text originates from both 3.5 and 4.5, and is placed to facilitate the storyline of the SPM.
SPM	26	48	27	12	We suggest to move this section to section 3.3 on interaction between mitigation and adaptation, which is the place to talk about the integration with development (or even taking a development perspective in solving climate change ("development first", green growth, green economy, climate resilient development, etc) [Government of Netherlands]	Rejected. Integrated responses are very much linked to a) response options; and b) policies, both of which are covered in Topic 4.
SPM	26	48	27	12	Section 4.4. Is it possible to expand this section and identify more interactions between mitigation and adaptation and sustainable development [Government of Norway]	Accepted. Attempt made to enhance section without adding words.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	26	48	27	12	this section of the SPM (4.4) should include citation of 4.6.3, given its focus on integrated responses and managing synergies and trade-offs across multiple objectives; this is consistent with statements offered here; I note that 4.6.3 is not cited in any other part of the SPM. Perhaps some language from the headline statement from 4.6.3 could be brought into SPM 4.4 [Stewart Cohen, Canada]	Accepted, though reference to section has changed to 4.5 in the final version.
SPM	26	48			We support the inclusion of this section in the summary for policy makers in particular reference to trade-offs and synergies across multiple objectives (co benefits and adverse side effects). [Government of New Zealand]	Noted.
SPM	26	50	26	52	Boxed text seems to omit some key messages from the underlying reports that are referenced here. We suggest to delete this boxed text. [Government of Netherlands]	Accepted. Headline replaced with more relevant findings.
SPM	26	50	26	52	Not sure achieving sustainable development and addressing climate change are "concerns", they could be rather qualified as "goals" or "objectives". Also the part of the sentence "attention to interactions between types of policies" seems to miss something: "require"? [Government of France]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	26	50	27	2	<p>• SPM Section 4.4 [P26 L50-56, P27 L1-12] The origin of this text is not clear. Some part of sentences comes from WGIII SPM, but the origin of the rest is not clear.</p> <p>The concept that change is considered most effective when it reflects country and local visions and approaches to achieving sustainable development according to national circumstances and priorities (footnote 17, page 15, SPM WGIII</p> <p>The concept of second-order impacts could also be included (WGII SPM)</p> <p>Substantive redrafting is required. [Government of Saudi Arabia]</p>	Noted. Section is a synthesis of WG II and WG III material, and therefore not always traceable word-for-word to either SPM. Effort made to enhance section.
SPM	26	52			Suggest changing "the likely need for" to "the possible need for" or "can be supported by". The latter is closest to what is stated in Section 3.5. We cannot seem to find support for "likely" in underlying documents. [Government of Canada]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	26	54	26	54	Consider to shift the bold statement with some of the sentences after "Climate change is a threat multiplier. Development along current pathway will contribute to climate risk and vulnerability, further eroding the basis for sustainable development " [Government of Norway]	The points raised later in the paragraph are now further emphasized.
SPM	26	54	26	54	Consider changing "equitable and sustainable development" to "equity and sustainable development" to be more consistent with the terminology in WGIII Ch. 4. [Government of United States of America]	Partially accepted. New text reads 'CC is a threat to SD'.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	26	54	27	2	RETAIN: "Climate change poses an increasing threat to equitable and sustainable development. Some climate-related impacts on development are already being observed. Climate change is a threat multiplier, exacerbating other threats to social and natural systems in ways that place additional burdens on the poor and constrain possible development paths for all. Development along current pathways can contribute to climate risk and vulnerability, further eroding the basis for sustainable development." ADD: Emergency. ADD: This confirms that we are past DAI. [Peter Carter, Canada]	These topics are still addressed although more concisely.
SPM	26	54	27	12	This section of the SPM would be strengthened by addressing the co-benefits for human health, agriculture, ecosystems, natural resources of mitigation scenarios (see P86). Figure 1.6 on P39 could also be included in this section of the SPM as it relates development and CO2 emissions. [Government of France]	Accepted.
SPM	26	55	26	56	Please avoid jargon such as "threat multiplier" (we think also that this term was removed from the WGIII SPM in the final revisions). Without explanation, this term lead to the reader over-emphasizing the impact of climate change on equitable and sustainable development relative to the impacts of other global change factors. A suggestion would be to replace "Climate change is a threat multiplier, exacerbating other threats to social and natural systems ..." with "Climate change exacerbates other threats to social and natural systems ...". [Government of Canada]	Accepted: phrased differently.
SPM	26	56	26	56	Please consider to replace "the poor" with "poor populations and regions" [Government of Norway]	The more concise phrasing is considered clear enough and thus has not been revised.
SPM	27	0			The important issue how to overcome the social and political barriers that have so far prevented ambitious action is completely missing. This is a crucial issue (by awareness raising? By ethical arguments? By multiple benefit approaches?), and we would welcome a proposal by the authors. [Government of Netherlands]	Noted. Though authors recognized the importance of the topic, the key findings from the underlying report are focused elsewhere. The SPM must reflect those findings.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	27	0			We mis a short and clear summary of the main findngs. we suggest adding the following: "Climate change results from natural causes, such as climate variability or volcanic eruptions, and from human activities such as fossil fuel combustion. Human causes have dominated natural causes for over half a century. Global warming has been 0.89°C since 1900, and will continue due to the high concentrations of greenhouse gases already in the air, and the continuing emissions. The temperature increase has been largest on continents and in polar regions. The resulting expansion of sea water and melting of ice on land made sea levels rise by 19cm since 1900. This will continue for centuries and eventually add up to 7 meters. Other impacts of climate change include shifting precipitation patterns and more extreme weather events, such as hurricanes. Nature and society are capable to adapt to some impacts of climate change, but at a cost and to a limited extent. Climate change will decrease ecosystem services, threaten food and energy security, increase weather-related disasters, conflict and migration, and loss of coastal areas. Limiting global temperature increase to 2°C compared to pre-industrial has been adopted as an inspirational goal. Since most greenhouse gases are long-lived and get mixed throughout the atmosphere, it does not matter when and where these gases are emitted. This implies that all larger emitters will have to reduce net greenhouse gas emissions to near or below zero before 2100. Curbing emissions quickly will keep the cumulative costs relatively low, while delayed action makes it less likely climate change can be limited to 2°C, increases costs and forces the use of still unproven and potentially more sensitive options such as nuclear energy and bio-energy combined with storage of CO2 underground. There are co-benefits to energy efficiency and sustainable energy sources, such as improved energy security and air quality." [Government of Netherlands]	Noted. Space constraints do not allow for a comprehensive summary of the SPM.
SPM	27	1	27	1	It is suggested to add “, particularly to developing countries.” after “constrain possible development pathway for all”. [Government of China]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	27	1	27	2	The vague expression "can contribute" is not justified, as it is a matter of fact that the current development "will increase climate change risks. Please replace by a statement of fact using the indicative mood. If the current development also increases vulnerability to climate change is less clear, the statements should possibly be separated. [Government of Germany]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	27	1			This sentence does not fit within this paragraph. It is taken out of context, especially when talking about current pathways. Reader is not sure about which ones. I suggest to take it out or reformulate it. [Government of Netherlands]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	27	1			we suggest to change "can contribute" to "contribute" to avoid ambiguity [Government of Netherlands]	Relevant wording removed in rewrite for reasons of space and focus.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	27	2	27	12	The para should should mention that non-action is not an option as it prevents climate resilience and sustainable development. In the bolded sentence please make reference to co-benefits as well, not only the trade-offs. In addition, it contains statements on the integrated approach to adaptation that have been previously mentioned, e.g. on the top of P 26, or under section 3.2.. Please shorten the text and improve structure. [Government of Germany]	The effect of delay and non-action is discussed in Topic 3 SPM material. Relevant bold text was removed in rewrite for reasons of space and focus. Accepted to shorten text and improve structure - attempt made.
SPM	27	2			to add the limited capacity of developing countries to give effect to national programs and local development. [Government of Nicaragua]	The importance of capacity is highlighted in the last paragraph of this section.
SPM	27	4	27	4	As it is formulated in the current draft it is difficult to understand the meaning of the first bold sentence- "casting climate policy...". Please consider if "Casting" can be replaced by "Developing". [Government of Norway]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	27	4	27	4	The formulation "Casting climate policy ... includes attention to ..." could be interpreted as being policy prescriptive. Consider revising. [Government of Canada]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	27	4	27	12	Excellent to finish the SPM with this paragraph on climate policy in the context of SD and multi-objectives! It can, and will be, polished of course but let's hope it stays there! [Government of Sweden]	Accepted.
SPM	27	4	27	12	Both mitigation and adpataion is needed and multiple benefit is clear when both actions are taken. However, financial and human resources are limited and this is the reason why "innovative finance", "public-private finance" etc. is needed. This report should be objective and therefore can say "should take measures and actions efficiently" at a part of conclusion. [Takashi Hongo, Japan]	Comment unclear. Private and public involvement is discussed in the revised 4.4. Additional words to note that efficient action should be taken doesn't seem warranted.
SPM	27	4	27	12	The para highlights the rationale for 'mainstreaming' or 'integration'. It would be useful to highlight this as at the moment the sentence misses the policy relevant message [Government of United Kingdom of Great Britain & Northern Ireland]	Accepted. Paragraph has been reworded for clarity and focus.

Review comments on the IPCC AR5 Synthesis Report First Order Draft - SPM

SPM	27	4		5	RETAIN: "Casting climate policy in the context of sustainable development includes attention to achieving climate resilience through both adaptation and mitigation." ADD: The only effective method for long-term mitigation and adaptation is the transformative economics of sustainable development that leads to the replacement of sources of greenhouse gas pollution by safe, non-polluting alternatives. [RATIONALE: Approaches in the SYR that are based on today's economic model and its environmentally perverse market failure (Stern 2006) cannot be effective. Under the 1992 Agenda 21, governments agreed to the transformative economics of sustainable development, which includes the principles of pollution prevention, precaution, polluter pays, full cost accounting, oppressive debt cancellation, and internalization of externalized socio-environmental costs. Under the Rio+20, governments agreed that they are still obligated by the 1992 Rio agreements. For mitigation and adaptation, there must be zero future discounting.] [Peter Carter, Canada]	Rejected. Previous sections of the SPM present a number of alternative options and strategies for mitigation and adaptation. It would be inappropriate to select one in this final paragraph.
SPM	27	7	27	7	Ethical elements or considerations like equity and fairness are mentioned in nowhere in the SPM. It is suggested to add "Sustainable development and equity provide a basis for assessing climate policies and highlight the need for addressing the risks of climate change." after the words in bold in Line 7, Page 27, SPM 4.4 [Government of China]	equity, justice, and fairness are all mentioned in Topic 3 in the final draft.
SPM	27	7	27	7	change 'intersect with' to 'interact with'. It fits better with author's intention. [Government of Republic of Korea]	Relevant wording removed in rewrite for reasons of space and focus.
SPM	27	7		9	There is a lot of extraneous wording used here to explain the concepts of co-benefits and side effects. Suggest focusing more on relevant findings rather than explaining these relatively well-understood concepts. [Government of Canada]	Accepted.
SPM	27	11	27	11	This line talks about climate change policies improving economic well-being. It somehow contradicts the sections 3.1, 3.3 that talk about losses in consumption and high costs. [European Union]	Rejected. The point of the sentence is to clarify that there are actions that can be pursued now that will help to improve well-being (e.g. co-benefits). This is not contradictory to the point that maintaining a global increase of temperature below 2 degrees will require substantial shifts in investment.
SPM	27	12			This section could benefit from some examples of synergies and trade-offs between mitigation, adaptation and sustainable development. An example of a measure that often has synergies between all three areas is sustainable land management. Measures in the AFOLU sector in particular (e.g. REDD, afforestation or soil conservation) can, if implemented properly, contribute simultaneously to mitigation, adaptation and sustainable development. There may also be other examples that could illustrate the interactions between mitigation, adaptation and sustainable development. [Government of Norway]	Accepted. Provided in rewrite.