

Review comments on the IPCC AR5 Synthesis Report First Order Draft - Topic 1

Chapter	From Page	From Line	To Page	To Line	Comment	Response
Topic 1	0	0			General comments on the Topic 1:  Overall the Topic 1 is not too bad as first order draft, but there are some minor changes recommended: Figures have to indicator correctly or should be cited in the context. A couple of sub-sections would be better to merge with other sections or move to related topics. Details are please referred to specific comments. [Government of Republic of Korea]	Taken into account, text revised
Topic 1	0				In many cases, the uncertainty or confidence is highlighted by using italics (e.g., page 45, lines 6-8. This is fine, however, people might be also interested, or more interested, in issues rather than uncertainty/confidence. Therefore, I suggest to also highlight issues, e.g. in the mentioned lines, highlight "extreme weather and climate events", or in line 14 on the same page, highlight "heat-related mortality" etc. [Government of Hungary]	Rejected. There is an approved IPCC style guide.
Topic 1	0				Suggest to better separate facts from assessment and observation. For example, on page 46, there are facts like "Direct and insured losses from weather-related disasters have increased substantially in recent decades both globally and regionally" and several paras with assessments, and these are mixed. A better approach may be that first, facts and modelling results are reported, then paras with observations. [Government of Hungary]	Taken into account., Greatest care is applied to characterise level of confidence, include where facts are stated as such.
Topic 1	0				In texts on emissions data are always expressed in GtCO <sub>2</sub> (-eq)/yr. In y-axis of graph unit is GtC/yr. Make units consistent. [Government of Netherlands]	Accepted.
Topic 1	31	0	31	0	Consider moving the statement (p. 32, l.1-2) about different colors in the line graphs to p. 31,l.25, so before introducing the graphs separately: "For all time-series, coloured lines indicate different datasets, and uncertainties (where assessed in the underlying chapters) are indicated by coloured shading." OR consider including a legend next to the time-series graphs explaining what are the different colored lines and shades. [Government of Netherlands]	Accepted. Caption completely re-written.
Topic 1	31	0	31	0	Provide a title to the x-axis of the following graphs: left column/bottom panel and right column/bottom panel. According to the corresponding graphs in the WG1 report (Fig. TS.2 and TFE.1, Figure 2, respectively), these axes are both named as "Trend". However, trend is awkward for something without a time unit, like the temperature ( left column/bottom panel) figure. Add this in the y-axis. Also try to harmonize between temperature and precipitation, so both per year per decade or over the entire period. [Government of Netherlands]	Reject. Figure has been substantially simplified and the numbers of panels have been reduced. However, the maps showing observed temperature and precipitation changes are direct copies from the approved WGI SPM (Figures WGI SPM.1b and WGI SPM.2, right panel). The

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Topic 1	31	0	31	0	Graph from the middle column/top panel: the y-axis title refers to the reference period "1961-1990" when the graph title refers a period of "1850-2012". This could be confusing to the readers. So either: - Include to the caption corresponding to this graph in the SYR an explanation of what does the period 1961-1990 means, which is present in the WG I report (caption of the Figure SPM.1, page 6); OR - Exclude "relative to 1961-1990" from the y-axis title of the graph in the SYR report. [Government of Netherlands]	Reject. Figure has been substantially simplified and the numbers of panels have been reduced. However, both pieces of information mentioned by the reviewer have been retained. The Panel title specifies the period considered, i.e., 1850-2012; the y-axis title specifies the reference period for the anomalies shown in the timeseries. Also, please note that the respective panels are identical to the approved WGI
Topic 1	31	0	31	0	Graph from the right column/top panel: add "(0-700m)" between "upper" and "ocean" in the graph title. Although this information is in the caption, it is important to be in the graph as well. [Government of Netherlands]	Taken into account, new ocean energy accumulation figure added.
Topic 1	31	0	31	0	Graph from the left column/top panel: Antarctic Sea Ice Extent (February): besides the fact that any graph was found similar to the lines corresponding to the Antarctic sea ice extent (the closest one was found in Figure 9.24b from the WG I, which hasn't been referenced in the references list in the caption of Figure 1.1 from SYR), this graph also doesn't confirm what is being said in SYR (p.31, l. 21-22) as regards a decrease in the sea ice extent (this is just confirmed by the arctic sea). So it is suggested to exclude it from the graph and keep only the one related to the Arctic sea OR provide the correct reference in the list of references in the caption of the Figure 1.1. [Government of Netherlands]	rejected, Antarctic sea ice needed for balance, information available in WGI report
Topic 1	31	0	31	0	It is not clear from the figures or captions of the figures Middle column, bottom panel and Right column, top panel what the change they show is relative to.: include these. [Government of Netherlands]	Taken into account figure and caption revised
Topic 1	31	0	31	0	it is not referred in the graph from the left column/bottom panel if the observed temperature change in the surface is an annual average or something else. Include this information in the caption. [Government of Netherlands]	Taken into account, figure and caption revised
Topic 1	31	0	31	0	Consider removing the graph with Surface Ocean pH (it has the least information to add in addition to the text). Replace it by a graph related to snow amounts decrease, which adds information to the text (page 31, lines 21-22) and, thus, should be seen in Figure 1.1 for consistency between the text and the figure. [Government of Netherlands]	Taken into account, figure revised and simplified (hence snow not added)
Topic 1	31	0	31	0	Organize the graphs by topic in a logical order (close to each other, by columns for example) instead of a randomized order. This will allow a better and quicker understanding. [Government of Netherlands]	Taken into figure reorganized
Topic 1	31	0	31	0	Attribute capital letters to each graph and refer to them in the caption by letters instead of columns/panels, it turns the reading and identification of the graph in the caption much easier. [Government of Netherlands]	taken into account, graphic revised
Topic 1	31	3	31	3	Human emissions of greenhouse gases have continued to rise since "preindustrial levels" 1970 [Government of Bolivia]	headline revised

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Topic 1	31	3	31	4	"have continued to rise since 1970" sounds awkward and the reference to 1970 is not easily understood. Excluding since 1970 would improve the readability of the sentence. If for some reason you want to keep a specific year, change "since" to "after", also consider changing "over the last decade" to "in the last decade". [Government of Netherlands]	headline revised
Topic 1	31	3	31	4	Consider whether it is necessary 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 also 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? If the latter, suggest revising to say "total emissions...." [Government of Canada]	headline revised
Topic 1	31	3	31	4	Something is wrong with "climate system climate system", and perhaps also "decade.." . I guess that these are just redundant. [Kooiti Masuda, Japan]	headline revised
Topic 1	31	3	31	6	It is unclear to why 1970 is such an important year - surely the emissions have been rising before that. And then this key message talks about the human influence being the dominant cause since 1950 that makes the 1970 even more confusing. [European Union]	accepted, headline statement revised
Topic 1	31	3	31	6	In the text "Human emissions of greenhouse gases have continued to rise since 1970 with larger absolute increases over the last decade. Human influence on the climate system climate system is clear, and is estimated to have been the dominant cause of warming since 1950. Changing climate has been linked to impacts on natural and human systems on all continents and across the oceans", please, adds "about" before "1970" and "1950" (as indicated below).Also, in line 3, eliminates the double point after "decade" and the double words "climate system". [Government of Argentina]	accepted, headline statement revised
Topic 1	31	3	31	6	Suggest this shaded box begin with the statement from section 1.2, "Warming of the climate system is unequivocal." This is a strong statement that is cited often and it should be elevated to the headline box for Topic 1. 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]	taken into account; headline revised, note that warming is unequivocal is in the observed section headline.
Topic 1	31	3	31	6	The wording sounds vague and at times avoiding commitment. "Climate system" repeated on line 4. "Human influence on the climate system is clear"...isn't it "human activities" that affect the climate system? "Changing climate has been linked to impacts on.." what impacts? Why not say outright that "the evidence is strong that the changing climate has impacted ..." [Government of United States of America]	accepted, headline statement revised
Topic 1	31	3	31	34	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]	headline revised

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Topic 1	31	3			"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 REFERING TO] than over previous decades". [David Wratt, New Zealand]	accepted, headline statement revised
Topic 1	31	4	31	4	"over the last decade.. Human influence on the climate system climate system is clear" should read "over the last decade. Human influence on the climate system is clear". Delete repeated "." and "climate system". [Government of Brazil]	headline revised
Topic 1	31	4	31	4	"Climate System" has been repeatedly written. Delete the first "Climate System" [Government of United Republic of Tanzania]	headline revised
Topic 1	31	4	31	4	Delete 'climate system' (redundant fragment) [Government of France]	headline revised
Topic 1	31	4	31	4	"climate system" is repeated [Government of Sweden]	headline revised
Topic 1	31	4	31	4	Delete "climate system" after the first "climate system". [Government of Japan]	headline revised
Topic 1	31	4	31	4	Please delete the second dot after the word "decade" [JACQUES ANDRE NDIONE, SENEGAL]	headline revised
Topic 1	31	4	31	4	Editorial: Delete one of the "." [Government of Norway]	headline revised
Topic 1	31	4	31	4	The phrase " Climate System" in the second sentence is repeated. Consider deleting one [Government of Kenya]	headline revised
Topic 1	31	4	31	4	influence on the climate system climate system is clear: repetition of climate system [Lena Menzel, Germany]	headline revised
Topic 1	31	4	31	4	A typo – 'climate change' was written twice. [Young-june Choi, South Korea]	headline revised
Topic 1	31	4	31	5	"climate system" is doubly wirtten. [Akihiko Murata, Japan]	headline revised
Topic 1	31	4	31	5	Suggest deleting "estimated to have been" and replacing it with " is extremely likely to have been". This is stronger language that was used by WGI. [Government of Canada]	headline revised
Topic 1	31	4	31	5	"the dominant cause:" in fact human influence has been estimated to produce an amount of warming that very closely equals the total observed warming. [Government of United States of America]	headline revised
Topic 1	31	5	31	5	Change since 1950 by prindustrial levels [Government of Bolivia]	headline revised
Topic 1	31	5	31	5	Change "1950" to "the mid-20th century". Although 1950 corresponds to the beginning of the second half of 20th century, the background reports refer always to the mid-20th century, and this does not necessarily means specifically a start in 1950, but around this period. [Government of Netherlands]	headline revised
Topic 1	31	5	31	6	The word "linked" can be interpreted in multiple ways and sounds strong. Suggest to substitute the last sentence for the original one in the WGI report: "changes in climate have caused impacts on natural and human systems on all continents and across the oceans." [Government of Netherlands]	headline revised
Topic 1	31	5			Please replace "linked" with "attributed to" and rephrase sentence appropriately. [Government of Germany]	headline revised

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Topic 1	31	6	31	6	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 revised
Topic 1	31	10	31	11	Suggested rewrite: "Topic 1 focuses on observational evidence for a changing climate, the impacts caused by this change and the human contributions to it. " [Government of Netherlands]	accepted
Topic 1	31	13	31	13	All other sections are denoted by brackets yet Section 1.4 is called out in main text. This makes the whole paragraph feel odd. It would be cleaner to rewrite in such a way that Section 1.4 could be referenced as (1.4) for consistency. [Peter Thorne, Norway]	rejected, flows better like this
Topic 1	31	14	31	15	Exposure is a component of Vulnerability complex... Vulnerability depends on exposure, sensitivity and adaptation capacity. Please change this sentence by saying "Vulnerability in the context of extreme events [...]" instead of "Vulnerability and exposure in the context of extreme events [...]" [JACQUES ANDRE NDIONE, SENEGAL]	sentence revised to reflect additional section
Topic 1	31	17	31	17	"Figure SPM2" should probably be "Figure 1.5" [Government of Sweden]	Noted. Referent unclear
Topic 1	31	18	34	3	1.2 should add 1.2.5 land, such as land temperature, surface radiation budget, humidity, evaporation and runoff [Zong-Ci Zhao, China]	Rejected. This is a synthesis
Topic 1	31	20	31	20	To include what is in red: and since the 1950s, due to historic accumulation of emissions since preindustrial times, [Government of Bolivia]	Taken into account, headline revised
Topic 1	31	20	31	22	Since there has been so much press about the "hiatus", it might be good to put in a sentence saying that the recent short term levelling in the observed warming trend cannot be distinguished from interannual variability, and the overarching longterm pattern remains that of a warming trend. If not in the gray box, definitely it should be mentioned in the bullets for ocean and atmosphere. [Government of United States of America]	Accepted, reference to 'hiatus' and box 1.1 added
Topic 1	31	20	31	22	The observed RATES of change are unprecedented. The changes themselves have occurred in the past. [Government of United States of America]	Rejected, approved WGI text
Topic 1	31	21			"warmed, the amounts of "~ warmed, amounts of .. [Government of Hungary]	Reject. Text as approval spm
Topic 1	31	23	31	23	Figure 1.1 is very hard to read, there are too many and too small panels. Green and yellow texts are very hard to read. Figure caption is divided between two separate pages, make sure the figure - with captions - stays on one page. Panels should be individually numbered and described in the caption [Government of Denmark]	Take into account, figure improved
Topic 1	31	23	31	23	Figure 1.1 is hardly readable. The resolution is too poor. [Government of Switzerland]	Taken into account, figure improved.
Topic 1	31	23	31	24	There are 8 charts here, all under the description of "Figure 1.1," which is all that is referenced in the text later when referring to these graphs. It will be confusing for certain readers to jump back and forth and to figure out which chart is being referred to. It is suggested to label each chart, as "1.1.a" for example. [Government of Germany]	Taken into account, figure simplified and labelled.

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Topic 1	31	23	31	24	Figure 1.1 Many of the panels are way too small to read. [Government of United States of America]	Take into account, figure improved
Topic 1	31	23	31	24	The figures are too small and the captions are very long. The explanation of the colors might be better placed up front because it is easy to miss when it is in another page. Also caption could be shortened by labeling the lines inside the figure itself, or putting a legend inside the Figure. [Government of United States of America]	Take into account, figure and caption improved.
Topic 1	31	23	31	34	Understanding of the figure could be enhanced if the panels were labelled (a), (b) (c) etc as this would avoid having to use "left column, top panel" etc. [Government of New Zealand]	Take into account, labels added.
Topic 1	31	23	31	34	Figure 1.1: We would like to make two suggestions on this figure. First suggestion is to improving on presentation. The Figure 1.1 has 7 graphs and two maps and it is not easy to indicate each of it. Please put indicators for each diagram or maps in this figure such as (a) ~ (i) in the way to find easy. Also please put legend for symbols in maps/graphs.  Second suggestion is to make the section is more understandable as it shall be much easier for audiences if maps/graphs in Figure 1.1 is relocated to wherever subject are relevant. In this case please indicate where the each graph or map comes from. [Government of Republic of Korea]	taken into account, figure revised and simplified. References to WG reports indicate where findings and figures come from
Topic 1	31	23	34	3	Topic1-1.2: This section would aim to describe the observed changes using Figure 1.1, but unfortunately the Figure 1.1 is too informative to understand. We made two suggestions on Figure 1.1; please refer to our comments on Figure 1.1 later.  Also this section supposed to be a sort of comprehensive summary of observed changes in the climate system, but synthesized messages are missed either the start or end of the section. Please put a comprehensive key findings suitable place in the section. [Government of Republic of Korea]	Taken into account, section and figure revised
Topic 1	31	24	31	24	Quality of Figure 1.1 should be improved [Government of Argentina]	Taken into account.
Topic 1	31	24	31	24	The colors of the lines in the top left, middle top and bottom, and right top and middle panels need to be explained in a key or the legend. [Government of United States of America]	Taken into account, crossreference is added to where full information on colourcode is
Topic 1	31	24	31	24	Figure 1.1: Provide missing error bars in some of the plots. In some panels at least the differences among the colored curves are unclear. [Government of United States of America]	Taken into account, crossreference is added to where full information on colourcode is
Topic 1	31	24	31	24	In panel (a) of Fig. 1.1, the authors should insert note that Antarctic data is for summer, or else this could be misleading. [Government of United States of America]	Taken into account, season/month added
Topic 1	31	24	31	34	Figure 1.1: The varying baselines used in this figure is very confusing. [European Union]	Taken into account.
Topic 1	31	24	31	34	Figure 1.1: The baseline for sea level change is not stated on the plot labels or in the figure caption. [European Union]	Taken into account now stated.

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Topic 1	31	24	31	34	Figure 1.1: The panels in this figure require labelling, especially for baseline. [European Union]	Taken into account, done.
Topic 1	31	25	31	34	Present what the colors stand for, not possible to follow the description in the legend by looking at the figure. [Government of Sweden]	Taken into account, crossreference is added to where full information on colourcode is
Topic 1	31	25	31	34	The figure caption does not cover all main elements of the figure. The yellow and black lines of the top panel, middle column are not explained. [Government of Norway]	Take into account, figure caption revised and references added to where further detail is found
Topic 1	31	25	31	34	The figure caption does not cover all main elements of the figure. Colours of left column, top panel are not explained. [Government of Norway]	Take into account, figure caption revised and references added to
Topic 1	31	25	31	34	The figure caption does not cover all main elements of the figure. Colours of middle column, bottom panel are not explained. [Government of Norway]	as T-515
Topic 1	31	25	31	34	The figure caption does not cover all main elements of the figure. Colours of right column, top panel are not explained. [Government of Norway]	as T-515
Topic 1	31	25	31	34	The figure caption does not cover all main elements of the figure. Colours of right column, middle panel are not explained. [Government of Norway]	as T-515
Topic 1	31	25	31	34	Figure 1.1: Suggest organizing this figure a bit more logically. For example, GHG changes and the direct chemical response of the ocean in terms of pH in the left hand column, surface temperature and precipitation indicators in the next column, cryosphere indicators in the third column (include snow cover extent as well), and ocean heat content and sea level change indicators in a last column. [Government of Canada]	Taken into account, figure revised.
Topic 1	31	26	31	26	Highlight (yellow), 13 Jun 2014 11:49 am, bindoff: [Nathaniel Lee Bindoff, Australia]	noted
Topic 1	31	26	31	26	Page 31, line 26. This panel is showing summer/autumn patterns of sea-ice change in the two hemispheres, we should say the summer distributions (to be clear) and why just february Antarctic rather than say January to Mar inclusive average? [Nathaniel Lee Bindoff, Australia]	Taken into account, figure and caption revised.
Topic 1	31	26	31	26	Page 31, line 26. This panel is showing summer/autumn patterns of sea-ice change in the two hemispheres, we should say the summer distributions (to be clear) and why just february Antarctic rather than say January to Mar inclusive average? [Nathaniel Lee Bindoff, Australia]	Taken into account, figure and caption revised
Topic 1	31	26	31	26	This panel is showing summer/autumn patterns of sea-ice change in the two hemispheres, we should say the summer distributions (to be clear) and why just february Antarctic rather than say January to Mar inclusive average? [Nathaniel Lee Bindoff, Australia]	see T1-678
Topic 1	31	28	31	28	Text should read "... methane (orange dots, red line)" . Why do the CO2 data not start in 1958/59? The Mauna Loa observations began then. [European Union]	Taken into account, figure now separate with clear caption.
Topic 1	31	28	31	28	Add "(CH4)" after "methane" Add "(N2O)" after "Nitrous Oxide" [Government of Netherlands]	accepted
Topic 1	31	31	31	31	perhaps add (top) and (bottom) after "annual and decadal averages" respectively to make more to which graph they belong, or change to a,b,c,d, etc [Government of Netherlands]	Taken into account.

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Topic 1	31	32	31	34	Please provide reference periods for all indicators, including sea level change, OHC and ocean pH. [Government of Sweden]	Taken into account, caption revised.
Topic 1	31		31		Fig 1.1 Good figure. [Government of Sweden]	Thanks
Topic 1	31		31		Figure 1.1 fonts too small. [Government of Italy]	Taken into account.
Topic 1	31		31		Figure 1.1: suggest removing Antarctic sea ice extent (the figure left column, top panel) [Government of Italy]	Reject. Important to show a quantity that has not changed. And Antarctic sea ice has been
Topic 1	31		31		Figure 1.1: The panel shows the evolution of different indicators of a changing global climate system. However, some of them are illustrating the warming of the climate system (as it is described in the headline immediately above the panel) and other is illustrating the direct effect of CO2 uptake by oceans not directly related with warming or climate change. We would suggest to split the fig.1.1 in two panels: one referred to warming indicators and another for evolution of atmospheric GHG concentrations and ocean pH. It can be misleading to present in the same graphics the direct effect of ocean acidification caused by CO2 uptake with indicators linked with warming [Government of Spain]	Taken into account.
Topic 1	31		33		Is there a synthesising statement on the recent 'slow down' in the rate of warming? [European Union]	bullet added to SYR report and crossreferenced to box 1.1
Topic 1	31			1	SYR used the "Causes" (SYR - 31, L1) in the beginning rather than "attribution", but in the other part no longer use the "Causes", but with the "attribution". Suggest using "attribution" within all the text for consistence. [Zong-Ci Zhao, China]	Reject. We cannot change title of Topic 1.
Topic 1	31				There do not appear to be any comments on changes in large scale drivers such as ENSO or the monsoon systems. [European Union]	rejected, this is not possible given the brief nature of the synthesis
Topic 1	31				It may help understanding and the ability to link observed with projected changes if the sections headings between Topic 1 and Topic 2 were more consistent. [European Union]	Taken into account, topics 1 and 2 were made as consistent as feasible.
Topic 1	31				Figure 1.1. Although important to show all main evidences in one figure, most of legend, titles, etc are not readable. [Government of Brazil]	Taken into account, figure improved.
Topic 1	31				Figure 1.1: I suggest to re-arrange the charts so that related issues are next to each other. First, meteo data: temp + precip, then heat and ice, and then the left. The chart on decadal averages is redundant, should be skipped. However, the non-strictly-climate information such as pH and GHG gases could also be left out and discussed in their respective topics. [Government of Hungary]	Taken into account, figure improved. Decadal chart kept as very informative and containing uncertainty
Topic 1	31				Figure 1.1. Time series graphs had better be horizontally aligned in terms of year numbers. [Government of Japan]	Take into account.
Topic 1	31				Figure 1.1 labels extremely faint. Consider increasing the font size or making them bold [Government of Kenya]	Taken into account.



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Topic 1	32	1	32	20	It should add the model uncertainties from first point of WG1 SPM Page 13 D1. "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)" [Zong-Ci Zhao, China]	This material is contained in the box, topic1
Topic 1	32	3	32	3	Throughout, spell out "statistically significant" when this is what is intended by the word "significant". [Government of Canada]	rejected, we dont want to deviate from approved text, and that this text is in some cases based on a combination of statistical testing
Topic 1	32	6	32	7	WGI should be added in front of all the "Figure" instance of the line of cite [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
Topic 1	32	7	32	7	Figure 4.SM.2: reference not clear [Lena Menzel, Germany]	Accepted
Topic 1	32	9	32	9	Could the reader be referred forward to Box 1.1 in this section - it seems rather important, as otherwise the reader may feel the report is hiding the hiatus-related issues. [Keith Shine, United Kingdom]	Accepted, bullet on hiatus has been added
Topic 1	32	12	32	13	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, although it is important to be included, especially because it has a higher confidence than the one being stated in this sentence of the SYR. Suggestion: include "was very likely the warmest 30-year period of the last 800 years (high confidence)" between "period 1983-2012" and "and likely the warmest". [Government of Netherlands]	Accepted
Topic 1	32	12	32	13	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]	Reject. Not included in ES neither in SPM WGI
Topic 1	32	15	32	15	I made comments on the equivalent statement in the SPM (5:33 and 5:34) [Keith Shine, United Kingdom]	Accepted. Text modified
Topic 1	32	15	32	18	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]	Accepted. Text added to the footnote
Topic 1	32	16	32	16	Footnote 5 should be included already at the brackets here instead of in line 18. [Government of Netherlands]	Accepted
Topic 1	32	18	32	18	In view of the common concern over the slowing-down temperature rise in the last 15 years, it is necessary to make a response to it. It is suggested to add "In addition to robust multi-decadal warming, global mean surface temperature exhibits substantial decadal and inter annual variability. The rate of warming over the past 15 years is smaller than the rate calculated since 1951." after "dataset available". [Government of China]	Taken into account, bullet added.
Topic 1	32	18	32	18	The reference to figure 1.1 needs a more specific reference. It could be done by individually numbering the panels in the figure. [Government of Denmark]	Taken into account, figure simplified; panels labelled, but we found reference to figure number

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Topic 1	32	20	32	20	The mode of observation "radiosondes and satellite" are rarely mentioned elsewhere, so I was curious to why they were mentioned here. [Keith Shine, United Kingdom]	Accepted, removed
Topic 1	32	20	32	23	Is a discussion of vertical structure relevant to most readers of this document? Consider deleting. [Government of United States of America]	rejected, this is a physically important fingerprint of
Topic 1	32	21	32	21	Delete "lower", WGI talks about the whole stratosphere [Government of Netherlands]	Reject. Robust statements are about lower stratosphere only.
Topic 1	32	22	32	22	rate of change and its vertical structure: specify that "its" refers to the troposphere (WGI ch2, last point in ES of Temperature section) [Lena Menzel, Germany]	Accepted
Topic 1	32	22	32	22	What exactly does "the rate of change" refer? Temperature, obviously, but where, exactly? [Government of United States of America]	Accepted
Topic 1	32	25	32	25	change "1951" to "1950". In the summary of the sub-chapter 2.5.1.2, page 202 of the WG I report (page 218 of the pdf), it is referred 1950 and not 1951. [Government of Netherlands]	Rejected. In the SPM and ES of the Chapter 1951 is indicated.
Topic 1	32	25	32	28	Could the authors simply say there are no clear long term trends, but that the effects may be manifested instead as extreme events, or in the timing of melting of precipitated snow, etc. and refer to those sections? [Government of United States of America]	Rejected. There is no that conclusion in the text.
Topic 1	32	26	32	27	Add "likely" between "has" and "increased". Likelihood has been referred on WG I, chapter 2 - Executive summary, page 161 of the report (178 pf pdf). [Government of Netherlands]	Accepted
Topic 1	32	27	32	28	The original report {WGI, 2.5.1.2 on p. 204} speaks of "zonally-averaged" instead of "area-averaged" trends. Adopt "zonally" as it differentiates trends per latitude from regional trends. [Government of Netherlands]	Rejected. SPM language used
Topic 1	32	28	32	28	The reference to figure 1.1 needs a more specific reference. It could be done by individually numbering the panels in the figure. [Government of Denmark]	Taken into account
Topic 1	32	28			is this low confidence due to limited data or high variability? [Government of Sweden]	Both.
Topic 1	32	30	32	30	Why say this? Its implicit in the preceding text in section 1.1? [Peter Thorne, Norway]	Accepted. Text erased
Topic 1	32	30	32	30	Observed changes in extremes are discussed in Section 1.5.: this is stated already in the introduction, please discuss if note to be removed here [Lena Menzel, Germany]	Accepted. Text erased
Topic 1	32	32	33	3	This feels like a disproportionate number of ocean key findings considering you pulled through only 4 (correctly in my view) for the atmosphere. You could combine the first two ocean paragraphs and delete the oxygen finding which has no logical implication for a policymaker anyway. [Peter Thorne, Norway]	Accepted. Text changed
Topic 1	32	32			The title should just read "Oceans" (just like 1.2.1 that reads "Atmosphere") [Government of Hungary]	Accepted
Topic 1	32	37	32	37	The reference to figure 1.1 needs a more specific reference. It could be done by individually numbering the panels in the figure. [Government of Denmark]	Accepted

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Topic 1	32	39	32	40	As ocean warming in deeper oceans is not only an important finding of AR5 WGI but is also a new finding since AR4, request insertion of the following text from AR5 WGI SPM:  It is likely that the ocean warmed from 3000 m to the bottom for the period 1992 to 2005, with the largest warming observed in the Southern Ocean. [Government of Japan]	Rejected. Too much information about ocean warming already.
Topic 1	32	39	32	40	Nothing is said about the warming of the ocean below the upper 75m in order to corroborate the argument. No confidence levels assigned for this statement. [Government of Netherlands]	Noted. Text contains statement of fact.
Topic 1	32	42	32	45	The significance of salinity changes is lost. Density differences are a critical element in ocean circulation, and density is affected by temperature and salinity. Therefore salinity changes in key areas have the potential to alter global ocean circulation in the future. [Government of United States of America]	Noted.
Topic 1	32	42	32	45	Even though oceanic surface salinity trends do reflect changes in (Evaporation - Precipitation) at the ocean surface to an extent, salinity changes are unlikely to result entirely from changes in evaporation and precipitation. Changes in ocean surface circulation may also play an important role and need to be accounted for. [Government of United States of America]	Reject. We cannot explain everything at depth. Potential role of ocean circulation is reflected in lower confidence in causes.
Topic 1	32	43	32	45	"Medium confidence" only applies to the changes, not the indirect evidence. Suggested rewrite for clarity: "These regional trends in ocean salinity give medium confidence that evaporation and precipitation over the oceans have changed." [Government of Netherlands]	Taken into account. It is true but changes the written style
Topic 1	32	47	32	49	I was unclear why the AMOC was singled out here - seemed to be of most relevance for Europe and North America. Why no discussion of El Nino, for example? [Keith Shine, United Kingdom]	Noted. But AMOC is one candidate mechanism for abrupt and irreversible change in climate
Topic 1	32	47	32	49	There is no observational evidence of a long-term trend in the Atlantic Meridional Overturning Circulation: Maybe the ACC could be included here, as there ARE changes? In WGI ch3 ES, second point in "changes in water masses and circulation" it reads "there is medium confidence that the ACC shifted south between 1950 and 2010, at a rate equivalent to about 1° of latitude in 40 years" [Lena Menzel, Germany]	Reject. ACC is not a candidate mechanism for abrupt and irreversible change.
Topic 1	32	47	32	49	Please make this statement understandable when reading also page 70, lines 16-20, i.e. how this bullet goes together with the latter, and make sure all is well picked up in Article 2 Box [Andreas Fischlin, Switzerland]	Taken into account. Sentence simplified.
Topic 1	32	47	32	49	Rather than focusing only on the AMOC, the point should be made that the ocean is a large volume and complex system, and therefore it has a lot of inertia. That is the ocean has the capacity to absorb a lot of energy before significant circulation changes will be manifest. However, at the that point, the changes will be hard to reverse. [Government of United States of America]	Noted. Energy uptake is treated in preceding paragraphs. AMOC is one candidate mechanism for abrupt and irreversible change in climate system, and its stability

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Topic 1	32	47	32	49	The Atlantic Meridional Overturning Circulation's (AMOC's) variability occurs at time scales of about 30 years. Thus a decade long continuous monitoring is not sufficient to quantify longterm trends in AMOC. Observational evidence has already been provided to indicate that the AMOC has been slowing down in the past few decades (For example: Bryden, Harry L., Hannah R. Longworth, and Stuart A. Cunningham. "Slowing of the Atlantic meridional overturning circulation at 25 N." Nature 438.7068 (2005): 655-657). Thus it is not as reported in the draft that there is lack of observational evidence for a decline in the strength of AMOC. [Government of United States of America]	Rejected. The Bryden et al. paper has been discredited by the continuous observation at 26.5°N.
Topic 1	32	51	32	51	Consider replacing "anthropogenic" by "increased levels of" because enhanced uptake of any kind of CO2 will result in ocean acidification [Government of Netherlands]	Reject. The observed rise in atmospheric CO2 concentration is anthropogenic.
Topic 1	32	51	32	51	Suggest deleting "gradual" - this is subject to interpretation, and some would suggest that the acidification is rapid. [Government of Canada]	Accepted.
Topic 1	32	51	32	53	The signature of ocean acidification exhibits a great degree of regionality. Thus, It would be nice to see a global distribution of the areas where ocean acidification manifests most profoundly, since upwelling, coastal as well as open ocean, plays an important role in that process. [Government of United States of America]	Noted. Information not available from WG1 report.
Topic 1	32				• SYR [P32 Section 1.2.1] does not provide rate of warming during 1998-2012 period as given in SPM (WGI). [Government of Saudi Arabia]	Taken into account. Corresponding paragraph from
Topic 1	33	1	33	1	"High agreement among analyses provides medium confidence" is inconsistent wording. [Government of Netherlands]	sentence removed
Topic 1	33	1	33	3	This statement is copied from WGI 3.8.3 on p. 300-301. The relevant statements in WGII 6.1.1.3 and 30.3.2.3 also refer to WGI 3.8.3. Therefore, consider removing the references to WGII. [Government of Netherlands]	sentence removed
Topic 1	33	1	33	3	The context of mentioning thermocline oxygen concentrations is unclear to me, and probably even more unclear for those from e.g. WG3 background. I would either elaborate, if it is really as important as the other things around it, or delete, as being too detailed. [Keith Shine, United Kingdom]	sentence removed
Topic 1	33	3	33	3	WGII 6.1.1.3, 30.3.2.3: these references are not appropriate here. WGII discusses the responses of marine life to climate related changes in the ocean, but the basis is thoroughly presented in the WGI reference. However, if you wish to keep the two references here, you should discuss if the corresponding WGII references should also be included in the CO2 and temperature parts. [Lena Menzel, Germany]	references removed
Topic 1	33	5	33	29	Please consider reflecting the content of the bolded text better in the paragraphs coming under and vice versa. For example, please consider mentioning the Antarctic sea ice and permafrost in the bolded text, and adding a few sentences to describe glaciers and snow cover in the text? [Government of Norway]	Taken into account.
Topic 1	33	5	33	29	Section 1.2.3. addressing observed changes in the cryosphere offers lots of information on ice sheets, sea ice and permafrost, but no details at all on glacier retreat. More balance in content is needed. [Government of Switzerland]	Material on glaciers added.

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Topic 1	33	5			A better information flow and structure in this chapter would begin with the section on the drivers of change before addressing observed changes. [Government of Switzerland]	Taken into account. Unclear what is meant by "Chapter".
Topic 1	33	7	33	9	Sentence states that mass of Greenland and Antarctic ice sheets have decreased. However, changes in the ice mass of Greenland and Antarctica are not shown in Figure 1.1. Similarly, Figure 1.1 does not show any measurements of glacier areas or lengths to support the statement that "glaciers have continued to shrink almost worldwide". [European Union]	cannot include everything in the limited space.
Topic 1	33	7	33	9	The statement implies that evidence of change in all cryospheric components is shown in Fig. 1.1, however the figure only shows sea ice trends (i.e. the figure is not a summary of cryospheric change) - consider reversing the order of the text and figure references or placing the figure reference lower down in this section where sea ice is discussed. Suggest also considering whether permafrost warming could be included in the summary statement with all other cryospheric components. [Government of Canada]	Changed as suggested
Topic 1	33	7	33	9	Over the last two decades: this time frame is only valid for Greenland and Antarctic ice sheets, but not for the other ice-masses, correct? Needs rewording to emphasize the "continue" for the other ice masses to make clear that the 2 decades timeframe does not apply to all. [Lena Menzel, Germany]	Text says continuing change for the other components.
Topic 1	33	7	33	9	Shouldn't the slight increase in Antarctic sea ice be mentioned here? [Government of United States of America]	text improved to describe regional and total antarctic changes.
Topic 1	33	7	33	16	According to the WG I report, 1.3.4.3, page 137 the loss of ice from the Antarctic ice sheet is occurring only (and not "mainly" as being referred) in the northern Antarctic Peninsula and the Amundsen Sea, while it is relatively stable or even thickening slightly in the rest of Antarctica. The value showing an increase of ice loss for this continent (referred in 1.13) occurs only because this loss is significant in the northern Antarctic Peninsula. The following is suggested: - don't generalize the ice mass loss to Antarctica, but rather specify it to the Peninsula only; - include the information given in the WG I report 1.3.4.3, page 137 (153 from the pdf) referred above, i.e., that the ice mass loss in the Antarctica Peninsula is significant, and this is why there is a net loss of ice in the Antarctic continent, but in the rest of Antarctica the ice sheet is relatively stable or slightly thickening. [Government of Netherlands]	The headline statement has been retained but the underlying text is now more specific.
Topic 1	33	8	33	8	Although northern hemisphere snow cover is mentioned in the header, it is not elaborated on in the following paragraphs. Maybe this is OK, [Keith Shine, United Kingdom]	now included
Topic 1	33	9	33	9	decrease in extent (high confidence): some of these ice masses decrease with very high confidence (WGII ch4, ES). Check if it is an option to say "high to very high confidence" or "at least high confidence" [Lena Menzel, Germany]	high confidence is appropriate

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Topic 1	33	10	33	10	Lines 7-8 make a reference to a global decrease of glaciers, but nothing else is referred to this part in this sub-chapter showing evidence of it. Thus, consider adding the following paragraph between the paragraphs from lines 7-9 and 11-16, : "The average rate of ice loss from glaciers around the world, excluding glaciers on the periphery of the ice sheets, was very likely 226 [91 to 361] Gt yr <sup>-1</sup> over the period 1971 to 2009, and very likely 275 [140 to 410] Gt yr <sup>-1</sup> over the period 1993 to 2009. {WGI 4.3}". Sentence can be found in the SPM of WGI B.3, page 9 of the report (page 25 of the pdf). [Government of Netherlands]	Glacier material now included.
Topic 1	33	11	33	11	To include after growth: due to historical acumulation of emissons since the preindustrial times. [Government of Bolivia]	this is an observational section. Attribution material not included
Topic 1	33	11	33	11	Because of increase in ice by 6Gt/yr the sentence should state "The average change in ice rate ...." instead of loss. [Government of Netherlands]	numbers now deleted to simplify text.
Topic 1	33	11	33	13	For consistency with the WG1 SPM and to improve clarity it would be helpful to use the term "ice mass" instead of simply "ice" when quantifying the ice mass loss of Greenland and the Antarctic ice sheet in section 1.2.3. [Government of Germany]	Acxcepted - change adopted
Topic 1	33	11	33	16	Can we convincingly to use Greenland's glaciers change during 1992-2001 and 2002-2011 to pinpoint the climate change effect on them? One usually uses the change of more than 30 years data to reflect the long-term effects of climate change. [Zong-Ci Zhao, China]	These results are quoted from WGI, and yes the results are meaningful
Topic 1	33	11	33	16	Replace lines from 11 to 16 with the following sentence "The average rate of ice loss from glaciers around the world, excluding glaciers on the periphery of the ice sheets, was very likely 226 [91 to 361] Gt yr <sup>-1</sup> over the period 1971 to 2009, and very likely 275 [140 to 410] Gt yr <sup>-1</sup> over the period 1993 to 2009." [Government of Italy]	Material on glaciers added, but not at the expense of deleting ice sheet information.
Topic 1	33	13	33	13	Because of increase in ice by 37Gt/yr the sentence should state "The average change in ice rate ...." instead of loss. [Government of Netherlands]	numbers now deleted to simplify text.
Topic 1	33	18	33	19	The original text reports "very high confidence" instead of "high confidence". {WGI 4.2.2.9 on p. 329-330} [Government of Netherlands]	WGI SPM says high confidence
Topic 1	33	18	33	19	Please consider to change the preposition before every season from "in" to "for" so that the sentence reads "... has decreased for every season and in every successive decade ....". Rationale: The change from " in every season" to "for every season" is to prevent the reader to understand this as a statement saying that every season have followed a season with less ice. In our understanding the statement here is to be understood as a statement of seasonal trends. [Government of Norway]	Change adpoted
Topic 1	33	21	33	22	and very likely in the range 9.4 to 13.6% per decade (range of 0.73 to 1.07 million km <sup>2</sup> per decade) for the summer sea ice minimum: please emphasize more clearly that the summer data are included in the annual data [Lena Menzel, Germany]	Summer sea ice minimum now included.
Topic 1	33	22	33	22	Add "(perennial sea ice)" after "ice minimum". This will help to a better understanding of what does really mean "sea ice minimum", and is part of this same sentence in the SPM of the WG 1 report, B.3, page 9 of the report (page 25 of the pdf). [Government of Netherlands]	accepted - change adopted.

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Topic 1	33	22	33	22	Remove reference to WGI Figure SPM.1 as it applies to global mean temperature increases instead of the changing cryosphere. Maybe you meant to refer to figure1.1? [Government of Netherlands]	Changed to Figure 1.1
Topic 1	33	22	33	22	WG1 Figure SPM.1: reference not correct. This is WGI Figure SPM.3 now [Lena Menzel, Germany]	Changed to Figure 1.1
Topic 1	33	22	33	22	Before: "It is very likely...", the authors should consider adding: "The extent of the older and thicker Arctic sea ice components (the perennial and multi-year components) decreased between 1979 and 2012 (very high confidence); and, the average winter sea ice thickness within the Arctic Basin decreased between 1980 and 2008 (high confidence)." Rationale: See AR5 WG1 Chapter 4 Executive Summary and Sections 4.2.2.1, 4.2.2.3, and 4.2.2.4. An understanding of the decrease in thickness is indispensable to understanding total ice loss, interannual variability, and the increasing rate of ice loss. [Government of United States of America]	Too great a level of detail to include here.
Topic 1	33	23	33	23	"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,..." This contradicts lines 12 to 14 on page 33 [H-Holger Rogner, Austria]	Lines 12-14 are for the ice sheet - this is for sea ice. No change
Topic 1	33	23	33	23	This sentence talks of Antarctic sea ice extent having increased yet the previous lines 18-22 in the same page talk of a decrease in extent of Arctic sea ice. This seems to be a contradiction but if indeed the extent of Antarctic sea ice has increased, then there is need for further explanation to justify this. [Government of Kenya]	The statements are correct. Here the observations are reported.
Topic 1	33	27	33	29	Can anything be said about observed changes in permafrost extent? [European Union]	material now included.
Topic 1	33	27	33	29	Perhaps the link between permafrost decline and release of GHGs could be highlighted here? [European Union]	Greenhouse gas implications reported elsewhere.
Topic 1	33	31			The title should just read "Sea level" (just like 1.2.1 reads "Atmosphere") [Government of Hungary]	Change done
Topic 1	33	33	34	3	We are missing information about terrestrial glaciers in this section in the mountain ranges in the Northern America, South America, Europe, and Asia. [Government of Netherlands]	These need to be in 1.2.3 not 1.2.4
Topic 1	33	37	33	40	It is very likely that the mean rate of global averaged sea level rise: are all numbers needed here? would it be an option just to state that the rate of sea level rise was highest in the last two decades, and then give the mean numbers for 1901-2010 and 1993-2010? [Lena Menzel, Germany]	The text has been simplified by deleting some numbers. But it would be misleading to state that the highest rate was in the last
Topic 1	33	39	33	39	Should be 'the higher rate during the latter period' [Government of Switzerland]	corrected, thank you
Topic 1	33	39	33	40	It is likely that similarly high rates occurred between 1920 and 1950: the background of this sentence requires explanation. [Lena Menzel, Germany]	This is an important piece of information directly from the WGI
Topic 1	33	54	34	3	Remove lines from 33 to 3 [Government of Italy]	Reject. Sea-level change is
Topic 1	33	54	34	3	not very clear why preindustrial data (last interglacial period) are only included for sea level rise. Why are preindustrial data not relevant for the other parameters/variables? [Lena Menzel, Germany]	Paleo sea level data is important for understanding the magnitude of potential sea level changes. There is insufficient space to add additional text here. The reader is

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Topic 1	33	54			Add a sentence about the relevance of this comparison [Government of Sweden]	There is insufficient space to add additional text here. The reader is referred to the relevant sections of
Topic 1	33	55	33	55	There are issues with the time period of the last interglacial period (quote p.425 WGI " Particularly important issues with regard to the LIG are (1) the ongoing debate on its initiation and duration (cf. 130 to 116 ka, Stirling et al., 1998; 124 to 119 ka, Thompson and Goldstein, 2005),": Suggestion to change (129,000 to 116,000 year ago) to (approximately 120,000 years ago) especially because the time period is not important because the next sentence refers to several thousand years after it. [Government of Netherlands]	This is text direct from the WGI report. No change.
Topic 1	34	5	39	7	In my view the graph showing GHG emission "transfers" through trade that were deleted from WGIII during approval should be introduced in this section, using a country aggregation more difficult to attack, if that is possible. In my view the point that trade between different regions results in substantial relocations of GHG emissions related to production and allows some regions to consume more "upstream" GHG embodied in the products is very important and should come through, if by any means possible. [Helmut Haberl, Austria]	Reject, synthesis report needs to be aligned with approved text in underlying SPMs.
Topic 1	34	7	34	7	well mixed greenhouse gas: gas or gases? use of singular and plural varies in this section [Lena Menzel, Germany]	Sentence reworded for clarity
Topic 1	34	7	34	8	There is need to explain what is meant by the phrase " well mixed greenhouse gase" [Government of Kenya]	Sentence reworded for clarity
Topic 1	34	7			use "gases" instead of "gas"; add "that are responsible for XX% of global climate change" (or: that are the most important contributors to the radiative forcing" or similar) after the paranthesis. This addition would explain why these gases are discussed and why they are discussed at the beginning of the chapter. [Government of Hungary]	Sentence reworded for clarity
Topic 1	34	8	34	8	large' - a substantive word needed. [Venkatachalam Ramaswamy, United States of America]	Sentence reworded for clarity
Topic 1	34	8	34	8	Sentence does not make sense - should it read "Despite the efforts of multinational ..." ? [European Union]	Reject, approved text
Topic 1	34	8	34	8	Despite multinational (delete 'of') [Peter Thorne, Norway]	accepted - change adopted.
Topic 1	34	8	34	8	"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 [Keith Shine, United Kingdom]	Reject, approved text
Topic 1	34	8	34	8	Grammatical error: remove "of" [Government of Canada]	accepted - change adopted.
Topic 1	34	8	34	9	Not all multinational institutions and national policies have aimed at mitigating emissions, not even in promises. [Venkatachalam Ramaswamy, United States of America]	Reject, approved text



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Topic 1	34	8	34	11	The sentence might be an overgeneralization. The closest relation to this sentence was found in WGIII_AR5_FD_Ch04, page 10 of 117 (page 412 from pdf), lines 19-33, but only relating this to developing countries. Consider a full stop (period) after "... the preceding decade." Change the remainder of the sentence to "The increases in greenhouse gas emissions are mainly driven by economic and population growth." [Government of Netherlands]	Agreed, text reworded
Topic 1	34	8			Replace "Depite of" with "Despite" or "In spite of". [David Wratt, New Zealand]	Reject, approved text
Topic 1	34	8			"Despite of" is very strange wording. Suggest replace with "Although there are ..." [Government of New Zealand]	Reject, approved text
Topic 1	34	9	34	9	Suggest revising this sentence to say "total anthropogenic GHG emissions" since this statement may not hold true for individual gases. [Government of Canada]	agreed
Topic 1	34	11			to add to the developed, high levels of emissions countries and the principle of common but differentiated responsibilities. [Government of Nicaragua]	Rejected, too detailed here
Topic 1	34	13	34	13	Natural and anthropogenic forcings: should "radiative" be included in title? [Lena Menzel, Germany]	agreed
Topic 1	34	15	34	20	please provide reference [Government of Netherlands]	Reference added
Topic 1	34	16	34	16	"variation in energy fluxes" - this is not quite correct - as the climate system responds to the forcing, the energy fluxes "revert" to their unperturbed quantity. Also the statement doesnt make clear the top-of-atmosphere perspective. Perhaps be more explicit "RF quantifies the extent to which the top-of-atmosphere energy fluxes are perturbed by the drivers"? [Keith Shine, United Kingdom]	Sentence reworded for clarity
Topic 1	34	16	34	16	"Radiative forcing (RF) quantifies the variation in energy fluxes caused by these drivers." Consider explaining what is meant by energy fluxes and the relevance of this variation to climate change questions, and why a positive RF value leads to warming and a negative value leads to cooling. The link may not be clear to a policymaker, and the concept of RF remains unclear as a result. [Government of Germany]	Sentence reworded for clarity
Topic 1	34	16	34	17	Industrial era defined here as 1750-2011, though elsewhere e.g. p11, line3, pre-industrial temperatures are referred to from 1850s. This point requires clarification, to avoid confusion to reader. [European Union]	Explicit date range used
Topic 1	34	18	34	18	Is there a strong sense among the authors that "larger than zero" and "smaller than zero" are easier for readers to understand than "positive" and "negative"? If not, suggest using the latter terminology. [Government of Canada]	Yes, text retained
Topic 1	34	22	34	22	Change "well mixed" to "well-mixed". [Government of Japan]	text reworded
Topic 1	34	22	34	33	These two paras do not fit here as the section is about RF in general. Suggest to move them right after the title 1.3.2. The only thing that needs to be said here, and needs to be said highlighted, is that it is most importantly the human-induced emissions of some gases that are mainly responsible for climate change, and not natural processes. [Government of Hungary]	structure slightly changed, trends in gases appropriate for drivers section

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Topic 1	34	23	34	24	According to the background report (WG I B.5, p. 11 (p.27 from pdf)), the statement that the current concentration is substantially higher than anytime within the last 800,000 years is true to all the main greenhouse gases, and not only to CO2. Thus, change the sentence in a way that you refer to all these gases. A change of the sentence can be, for example, the following: "The concentration of these greenhouse gases (Figure 1.1) is substantially higher than anytime within the last 800,000 years. CO2 concentration is now rising at its fastest-observed..." [Government of Netherlands]	Agreed, text reworded
Topic 1	34	23	34	25	We propose to add the sentence: "Also the atmospheric concentrations of methane and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years." [Government of Germany]	text reworded but differently than suggested
Topic 1	34	24	34	25	Suggest that the time period for the 2.0 ppm/yr increase in CO2 should be precisely defined rather than just saying "now". We suspect this value is for the decade ending in 2010, but one would obtain a higher value (2.14 ppm/yr) if the most recent 10 year period (2004-2013) was used. [Government of Canada]	Dates now given
Topic 1	34	25	34	25	Slightly strange to quote the decadal rate as in per year [Keith Shine, United Kingdom]	Rejected, standard of rest of report
Topic 1	34	25	34	27	CH4 concentrations were stable since the late 1990s instead of early 1990s, as WGI 6.3.3.1 on p. 506 reports a near-zero growth rate during 1999-2006. So replace "early" by "late". [Government of Netherlands]	Agreed, text reworded
Topic 1	34	26	34	27	'After almost one decade of stable CH4 concentrations since the early 1990's, atmospheric measurements have shown renewed growth since 2007'. Some possible reasons for the rebound should be given here. [Government of Switzerland]	Rejected, too detailed and uncertain to discuss here
Topic 1	34	27	34	27	Replace "0.75 ppb yr-1" by "0.73 ± 0.03 ppb yr-1"; AND add "over the last three decades" after "0.73 ± 0.03 ppb yr-1". Although "0.75 ppb yr-1" was found in the background report, the use of "0.73 ± 0.03 ppb yr-1" is better for consistency with p. 34 l. 25. The suggested value can be found in the WGI, Executive Summary, page 467 (483 of the pdf) as well as the suggested addition. [Government of Netherlands]	Accepted
Topic 1	34	29	34	29	Change "well mixed" to "well-mixed". [Toshihiko Takemura, Japan]	Text now deleted as too detailed
Topic 1	34	29	34	30	Please provide some more information on the meaning of "perspective" in this context. [Government of Germany]	Text now deleted as too detailed
Topic 1	34	29	34	33	The differences between 'emissions based and concentration based perspectives' could be explained in more detail. [European Union]	Text now deleted as too detailed
Topic 1	34	29	34	33	Readers might not understand what is meant by "from either the emission based or concentration based perspective" and might therefore be confused by the rest of this paragraph. The difference is explained later in the SYR in a footnote to Fig 2.1 on page 51. My suggestion is that only the statement "Changes in carbon dioxide are the largest single contributor to historical RF" be retained and the rest of this paragraph be deleted. However if you wish to retain the full paragraph then perhaps the footnote from Fig 2.1 should be used here as well. [David Wratt, New Zealand]	Text now deleted as too detailed

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Topic 1	34	29	34	33	Unclear to laypeople what the distinction between the concentration- and emission-based perspective is. Suggested rewrite: "CO2 emissions are the largest single contributor of historical RF. The total anthropogenic RF since 1750 is 2.29 ... etc.". If lines 30-33 are kept, refer to WGI 8.5.1 on p. 697-698. [Government of Netherlands]	Text now deleted as too detailed
Topic 1	34	29	34	34	please provide reference [Government of Netherlands]	Text now deleted as too detailed
Topic 1	34	33	34	33	Reference to main report missing. [Government of Italy]	Text now deleted as too detailed
Topic 1	34	35	34	35	Too many digits, change "2.29 [1.13 to 3.33] W m <sup>-2</sup> " to "2.3 [1.1 to 3.3] W m <sup>-2</sup> " [Government of Netherlands]	Accepted
Topic 1	34	35	34	35	"is" ... many other quantities in the WG1 observational section are just that, observations. Forcing is not one of these. So I think it would be better to say "the total ... RF ... is CALCULATED TO BE" to make clear that this is a model derived quantity rather than an observable [Keith Shine, United Kingdom]	Accepted
Topic 1	34	35	34	36	Suggest stating first that "The total anthropogenic radiative forcing is positive (that is, has a warming effect)" before getting into numbers. [Government of Canada]	Accepted
Topic 1	34	35	34	39	Suggest providing some further explanation in this paragraph about the increase since 1970. Is this growth linked to accumulated substances or is it fueled more generally by economic and population growth? [Government of Canada]	Agreed, some detail added
Topic 1	34	35	34	48	Topic 1.3.1 & Figure 1.2: The two paragraphs (line 35 – 48) and presented numbers in the top diagram of Figure 2.1 are not matched. Please clarify the rest of other anthropogenic forcings, except aerosol as it is only mentioned, with values relevant to the diagram. [Government of Republic of Korea]	Figure split and changed for clarity
Topic 1	34	37	34	37	"substantially higher" becomes an abstract word, especially when the background report clearly refers a percentage value. So add "(43%)" after "substantially higher", this way it becomes clear how substantially higher it is. [Government of Netherlands]	Accepted
Topic 1	34	37	34	37	Suggest removing the word "substantially" and adding the radiative forcing and range from the AR4 if this can be done in a way directly comparable to the AR5. [Haroon Kheshgi, United States of America]	text reworded
Topic 1	34	37	34	39	If the improved estimates of aerosol forcing is a larger contributor to the higher estimate of net radiative forcing, then suggest that this be listed first before the continued increase in GHGs. [Haroon Kheshgi, United States of America]	Rejected, in line with underlying chapter, effects are roughly same magnitude
Topic 1	34	41	34	41	Grammatical error: "include" should be "includes" [Government of Canada]	accepted
Topic 1	34	41	34	42	Suggested rewrite: "In Figure 1.2, the "other anthropogenic forcings" bar includes a warming contribution from ozone changes and cooling contributions from land-use albedo and aerosol changes." [Government of Netherlands]	Bars of figure are clarified in caption
Topic 1	34	41	34	57	Summarize and combine the 2 paragraphs. [Government of Italy]	rejected, paragraphs say different things but have been simplified
Topic 1	34	42	34	45	It is not stylistically consistent to bold text in the middle of the paragraph. Suggest edits such that this text comes at the paragraph inception to aid readability. [Peter Thorne, Norway]	Accepted, reworded

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Topic 1	34	43			The fact that the aerosol effect is -0.9 [-1.9 to -0.1] is not clear in Figure 1.2. Is this part of the "Other Anthrop." category? If so should be stated clearly. [Government of Netherlands]	Accepted, now explicitly stated
Topic 1	34	44	34	45	We propose to add: "...positive contribution from black carbon absorption of solar radiation." [Government of Germany]	Accepted
Topic 1	34	45	34	47	All of this paragraph should be in BOLD. [Government of United States of America]	Rejected, consistent with main messages in report
Topic 1	34	45			I suggest "an offsetting" be replaced by "a partially offsetting". [David Wratt, New Zealand]	Accepted
Topic 1	34	46	34	46	"the combined impact of aerosols" becomes vague: which combined impact? Change this into the information existing in this sentence in the background report (WGI SPM, C., page 14 (page 30 of the pdf): "aerosols and their interactions with clouds" [Government of Netherlands]	Text reworded to be explicit
Topic 1	34	47	34	47	While we understand that this in the section on observations, this is also a synthesis, so that we think that it would be important to briefly explain that the role of aerosols may not remain the same in the future, due to their short life-time in the atmosphere and their other polluting effects. [Government of Belgium]	Future is beyond scope of this topic, rejected
Topic 1	34	50	34	50	"can" - they DO cause natural forcings, so I would delete the "can [Keith Shine, United Kingdom]	accepted
Topic 1	34	50	34	57	Less probable natural forcings (e.g., due to large-scale clathrate atmospheric release) can also have a significant impact on climate change, and, despite their epistemic uncertainty, these potential forcings should not be ignored. [Carl Southwell, United States of America]	Rejected, only main terms mentioned here
Topic 1	34	50	34	57	Topic 1.3.1: 'There was a strong solar minimum in 2008/2009, which contributed a small cooling effect over the last 15 years' couldn't be found its source WGI 7.4 and 8.4. Even WGI SPM has a quite brief sentence relevant to this sentence but not quite supportive. Please provide where the authors get this. [Government of Republic of Korea]	Text now deleted as too detailed
Topic 1	34	50			"Changes in solar irradiance and volcanoes" ~ volcanic activities [Government of Hungary]	text reworded but differently than suggested
Topic 1	34	51	34	51	I would place "major" before "volcanic" - it is not all eruptions (indeed, it is not even all major eruptions if they are of the wrong type) that have a large impact [Keith Shine, United Kingdom]	Accepted
Topic 1	34	51			Please add the word "cooling" before "impact". [Government of Germany]	Accepted, and reworded
Topic 1	34	52	34	53	Could this be changed to 'caused a reduction in RF of 0.11'? [European Union]	text now deleted
Topic 1	34	52	34	53	Consider adding the missing part of this sentence, found in the SPM of WG I, C., page 14, which is ", which is approximately twice as strong as during the years 1999-2002." to be included in the end of this sentence in the SYR. [Government of Netherlands]	text now deleted
Topic 1	34	53	34	53	"contribute" - as we do not have direct observations of TSI over this period, some qualifier is needed "are believed to", "are estimated to have" [Keith Shine, United Kingdom]	Accepted

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Topic 1	34	54	34	54	This is an example of where I believe the SYR has stayed in its disciplinary bunker ... a reader from outside this community may not appreciate there is an 11-year cycle in TSI and so "minimum" has no context (indeed, the reader may be confused as to the sign of the overall change being positive if it has recently been a minimum!) [Keith Shine, United Kingdom]	text now deleted
Topic 1	34	54	34	55	The following part of this sentence "which contributed a small cooling effect over the last 15 years" was not found in the background report as being related to the solar minimum of 2008/2009. [Government of Netherlands]	text now deleted
Topic 1	34	54	34	55	Missing word --> There was a strong solar minimum in 2008/2009, 54 which contributed to a small cooling effect over the last 15 years. [Government of Netherlands]	text now deleted
Topic 1	34	54	34	55	The solar minimum in 2008/2009 followed a maximum around 2001/2002. So it seems, the solar minimum contributed a small cooling effect nearly over the last 10 years, not 15 years, please correct. [Government of Germany]	text now deleted
Topic 1	34	54	34	55	The wording of this sentence seems unclear : it might possibly be understood as suggesting that there was a cooling over the last 15 years (to which this solar minimum contributed), while the intention is not to say that a cooling was observed. Please ensure that the wording is consistent with the SPM of WGI. [Government of Belgium]	text now deleted
Topic 1	34	54	34	57	It appears that these findings are pointing to the observed reductions in surface warming trend over the periode 1998-2012. We believe that this is policy relevant information, but it should also include the other possible contributors such as redistribution of heat within the ocean. This is clearly linked in WGI SPM Section D.1 page 13. [Government of Norway]	text now deleted
Topic 1	34	55	34	55	I am not sure that the cosmic ray effect is of sufficient importance (compared to many others not discussed) to warrant inclusion here, but if it is kept, then some context is needed - maybe "effect of cosmic rays, the flux of which is modulated by variations in solar activity". [Keith Shine, United Kingdom]	text now deleted
Topic 1	34	57	34	57	Also refer to WGI SPM (p. 14) and WGI Box 9.2 (p. 769 in 9.4) for lines 50-55. So, suggested references: "{WGI SPM, 7.4, 8.4, 9.4}". [Government of Netherlands]	text now deleted
Topic 1	34	57	34	57	change (medium evidence, high agreement) to medium confidence to make statements onsistent troughout the syr [Government of Netherlands]	text now deleted
Topic 1	35	0	35	0	The diagram calls to the 3rd bar "Total Anthropogenic" but the second figure calls it "combined anthropogenic forcings". Suggestion: give the same name, using preferably "Total anthropogenic forcings" since it has a clearer and easier interpretation of what it wants to explain. (see also comment 1, 35, 4-7) [Government of Netherlands]	Figure headings are clarified
Topic 1	35	0	35	0	For consistency, use whiskers in both top and bottom figure [Government of Netherlands]	Figures now split and made consistent
Topic 1	35	0	35	0	Give a title to the top diagram that directly elucidates the reader to what does the diagram wants to show. [Government of Netherlands]	Accepted
Topic 1	35	0	35	0	Give a correct title to the x-axis of the bottom diagram [Government of Netherlands]	Accepted

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Topic 1	35	0	35	0	remove natural variability as it is has no forcing bar, but only an uncertainty range. This is confusing to the non-expert reader. Also include in the caption it refers to solar irradiance changes and volcanic aerosols (WGI, chapter 10, page 883) [Government of Netherlands]	Rejected but caption clarified
Topic 1	35	0	35	0	remove grey shading to indicate import bars, and move combined ant. Forcings bar to 2nd position to indicate importance and facilitate comparison with radiative forcing; [Government of Netherlands]	Rejected but figures now split
Topic 1	35	0	35	0	label the figures a) and b); [Government of Netherlands]	Figures now split
Topic 1	35	0	35	0	Two slightly different figures are not necessary (only difference is radiative forcing vs warming, and time periods 1750-1850). Suggestion: - Combine to one figure by putting the different GHGs in the greenhouse gas bar in second figure. [Government of Netherlands]	Figures now split
Topic 1	35	0			Figure 1.2, top diagram : Small vertical lines at the end of error lines, as in bottom diagram, would be nice [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
Topic 1	35	1	35	1	It is not suitable to show "CO2 equivalent" in the top of Figure 1.2 because the forcing mechanisms of aerosols, land-use change, change in solar irradiance, and volcanic eruptions are much different from that of greenhouse gases and then they cannot convert to "CO2 equivalent" concentrations. [Toshihiko Takemura, Japan]	Rejected, they are here in SYR
Topic 1	35	1	35	2	Figure 1.2: the two panels seem to be partly repetitive. Is it possible to create one combined graph? If both panels are needed, they should be consistent in style, if possible add legends for colors in both panels. If "WMGHG" in top panel and "Greenhouse gases" in bottom panel mean the same, the name should also be the same. The same applies to top "other anthrop" & "total anthrop" and bottom "other anthropogenic forcings" & "combined anthropogenic forcings" [Lena Menzel, Germany]	Figures now split. They say different things, so important to retain
Topic 1	35	1	35	2	Figure 1.2, bottom panel: Add x axis title [Lena Menzel, Germany]	Accepted
Topic 1	35	1	36		Refocused figures 1.2 and 1.3 [Government of Costa Rica]	Figures now split
Topic 1	35	1	39	7	Figures 1.2, 1.3, 1.4 , 1.5 and 1.6 are all on CO2 emissions. Although they all have different foci, it would be desirable if some could be combined in order to avoid the impression of repetition. Moreover, the combined figures could be panels of one figure on CO2 emissions, as in figure 1.1 (multiple observed indicators of a changing global climate system). Discuss if combination of figures for "forcings" and "human activities" is an option. [Lena Menzel, Germany]	Figures are changed but focus on co2 is appropriate
Topic 1	35	2	35	2	This very prominent figure is certainly technically correct within ist framework of assumptions. However, to the layman it seems to suggest that natural forcings and internal variability of the climate system are negligible 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]	Figure clarified

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Topic 1	35	3	35	17	Figure 1.2, lower panel. 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]	Figure clarified
Topic 1	35	4	35	7	It is being assumed by the reader that Total Anthrop.=WMGHG+Other Anthrop., because this is not written in the caption in order to ensure a correct interpretation of the data.Suggestion: Explain what total or combined anthropogenic is in the caption (see comment 1, 35, -) [Government of Netherlands]	Caption and headings are clarified
Topic 1	35	4	35	17	Do not like these two figures together. The problem is the message in the bottom figure purports to speak about forcings yet its uncertainty bars are different in sense than that in the top figure, which is because the derivation methods differ. State what 'other anthro forcings' mean i.e., what do they include? The caption speaks of aerosol cooling, but not all aerosols cool. [Venkatachalam Ramaswamy, United States of America]	Figures now split
Topic 1	35	6			Please replace "error lines" by "whiskers" as usual when referring to uncertainty - not errors. [Government of Germany]	Accepted
Topic 1	35	8	35	8	Page 35, Line 8. If I may express an opinion, I am glad that this figure is here. It shows clearly the consequences of the forcings changes on the observed temperature change, with the conclusion that the observed changes on a60 year period can be successfully described human influences, and that the competing alternative forcings, ie natural and internal variability donot have a contribution to make on this time scale. [Nathaniel Lee Bindoff, Australia]	Thank you, no action required
Topic 1	35	8	35	17	The legend of Figure 1.2 for bottom diagram seems strange. Why does explanation for assessed likely ranges (whiskers), which are error bars, come first? Explanations for each term, e.g., natural forcings, internal variability should come first, and later for the errors. [Akihiko Murata, Japan]	Caption and headings are clarified
Topic 1	35	9	35	9	use "total anthropogenic forcings" instead of "Combined anthropogenic forcings" if changing in in the figure (see comment 1, 35, -) [Government of Netherlands]	Accepted
Topic 1	35	10	35	17	Explain in the caption what is meant by "natural variability". If this is not possible and its bar in the diagram has been deleted as was suggested in another comment, delete the reference to it from the caption as well (see comment 1, 35, -) [Government of Netherlands]	Accepted
Topic 1	35	10	35	17	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 (899 from pdf), so, if this is it, describe it in the caption. [Government of Netherlands]	accepted

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Topic 1	35	11	35	13	It is not clear what is meant by "fingerprints for external forcing", turning this sentence incomprehensible. Clarify in a way that a non-expert can understand it. Suggested rewrite: "These ranges (colours) are based on comparing "fingerprints" of individual forcings to climate model simulations with observed climatic changes (WGI FAQ 10.1) and do not rely on the estimated radiative forcing magnitudes from the top panel." [Government of Netherlands]	Caption and headings are clarified
Topic 1	35	12	35	13	Page 35, line 12 to 13. I would replace the phrase, ";and do not rely on the estimated radiative forcing...from the top panel", with ";and are an independent estimate of the contributions of radiative forcing to the climate response at the earth's surface ."  The point being it is an indepenent assesment method of the climate response, and this is a way of showing that essentially the same response is seen in multiple way,.... [Nathaniel Lee Bindoff, Australia]	Figures now split
Topic 1	35	15	35	15	Page 35, line 15. The correlation that is referred to here does not give the cause of the correlation, and so it might be useful to say (if possible) that the correlation in uncertainty is caused in part from the correlation (in time and spatially) in the emission of greenhouse gases and aerosols, thus making the separation for attribution more difficult. The uncertainty, as I understand it is really about the characterisation of the uncertainty in Aerosols, and that reflects into the GHG contribution in this analysis. The AR4 radiation figure in the SPM showed this uncertainty in Aerosols relative to WMGHG. The top panel of this figure (Figure 1.2) also shows this same point, the main part of the uncertainy comes from the aerosols more than the uncertainty around the greenhouse gases. [Nathaniel Lee Bindoff, Australia]	Caption clarified
Topic 1	35	19	38	24	Would it be appropriate to discuss the 'trillionth ton' at this point? i.e. the IPCC defined emissions cap which should be aimed for to keep temperature change below 2 deg C. Highlight how far towards this target observed emissions are. [European Union]	Rejected, different units are used here



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Topic 1	35	19	38	24	Human activities affecting climate drivers are not summarized in the SPM 1. We propose two state one or more of the following conclusions from Section 1.3.2: 1. About half of cumulative anthropogenic CO2 emissions between 1750 and 2010 have occurred in the 21 last 40 years (high confidence). 2. About half of these anthropogenic CO2 emissions remained in the atmosphere ( $880 \pm 35$ GtCO <sub>2</sub> ) since 8 1750. The rest was removed from the atmosphere by sinks, and stored in the natural carbon cycle 9 reservoirs. 3. Total anthropogenic GHG emissions have continued to increase over 1970 to 2010 with larger absolute 14 decadal increases toward the end of this period (high confidence). 4. CO2 emissions from fossil fuel combustion and industrial processes contributed about 78% of the total 22 GHG emission increase from 1970 to 2010, with a similar percentage contribution for the period 2000–23 2010 (high confidence). 5. Annual anthropogenic GHG emissions have increased by 10 GtCO <sub>2</sub> eq between 2000 and 2010, with 8 this increase directly coming from energy supply (47%), industry (30%), transport (11%) and 9 buildings (3%) sectors (medium confidence). Accounting for indirect emissions raises the contributions 10 of the buildings and industry sectors (high confidence). 6. Regardless of the perspective taken, the largest share of anthropogenic CO2 emissions is emitted by a 12 small number of countries (high confidence). 7. Globally, economic and population growth continue to be the most important drivers of increases in 18 CO2 emissions from fossil fuel combustion. The contribution of population growth between 2000 and 19 2010 remained roughly identical to the previous three decades, while the contribution of economic 20 growth has risen sharply (high confidence). [Government of Netherlands]	Text added to bring in more human activity detail
Topic 1	35	21	35	23	• SYR [P35 L 21-23] Insert uncertainties and CO2 emissions from Agriculture  [Government of Saudi Arabia]	Rejected, too detailed here
Topic 1	35	21	36	30	Many numbers are not easily traceable with the given references. [Lena Menzel, Germany]	Agreed, referecing improved and checked
Topic 1	35	21	38	24	Rather than put a footnote about GtCO <sub>2</sub> eq, the authors should consider including a box explaining what it is. It would be too much effort to have to go read yet another report. [Government of United States of America]	Text and footnote clarified and metric box pointed to where it is now briefly discussed
Topic 1	35	22	35	22	It was found $555 \pm 85$ PgC in the WGI, which agrees with the 2000 stated here after conversion and rounding. However, it is confusing because the numbers are not rounded in WGIII. Suggestion to keep the not-rounded values for consistency with WGIII [Government of Netherlands]	Taken into account. New text uses consistent rounding.
Topic 1	35	22	35	22	Cumulative emissions shown here is 2000 GtCO <sub>2</sub> the WG I SPM states 1890 GtCO <sub>2</sub> 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]	Taken into account. New text uses consistent rounding.
Topic 1	35	22	36	3	WGIII 5.2 on p. 11 mentions $660 \pm 290$ Gt instead of $680 \pm 300$ , which is consistent with conversion from WGI 6.3. Also, round $585 \pm 330$ for consistency within the SYR or preferably use the unrounded values. See also comment 1, 36, 8-12 [Government of Netherlands]	Taken into account. New text uses consistent rounding.

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Topic 1	35	22			Change to: "Anthropogenic cumulative CO2 emissions were..." [Government of Netherlands]	Accepted.
Topic 1	35	23	36	1	The term flaring might not be obvious to the reader, suggest "flaring of hydrocarbon gases" . [Elvira Poloczanska, Australia]	Role of flaring clarified
Topic 1	35				Figure 1.2. Would it be possible to use the same groups of factors on both charts? Then it would be much easier to understand them. Details such as which GHGs are important are not discussed with warming, so they should not be discussed with RF, either. [Government of Hungary]	Taken into account. Figure has been split and revised.
Topic 1	35				Figure 1.2. Some lables in the lower panel diagram are faint. Consider enhancing them [Government of Kenya]	Taken into account. Figure has been split and revised.
Topic 1	36	0	36	0	Include in the title of the graph the period it refers to (1750-2011) [Government of Netherlands]	Taken into account. Figure has been revised.
Topic 1	36	0	36	0	provide a title (or at least the units) to the y-axis. [Government of Netherlands]	Taken into account. Figure has
Topic 1	36	0	36	0	The legend of the graph related to fossil fuel and cement production should refer "cement production" and not only "cement", to be clearer. [Government of Netherlands]	Taken into account. Figure has been revised.
Topic 1	36	0	36	0	terminology in text and graph are inconsistent as regards to units of mass. Consider changing the units from the graph to GtCO2 yr-1 or change in the caption and subsequent paragraphs to GtC/yr [Government of Netherlands]	Taken into account. Figure has been revised.
Topic 1	36	0			Figure 1.3 : The units should be written along the y-axis [Thomas Stocker/ WGI TSU, Switzerland]	Taken into account. Figure has been revised.
Topic 1	36	0			Is it not clear if the grey part is in addition to the orange one or if it is absolute value from 0 [Thomas Stocker/ WGI TSU, Switzerland]	Taken into account. Figure has been revised.
Topic 1	36	1	36	4	The inconsistency between units in the text (GtCO2) and in the figure (GtC) might confuse readers not familiar with the fact that there is a factor of 44/12 or 3.66 needed to convert. Suggest picking one set of units. [Government of Canada]	Units normalised to GtCO2
Topic 1	36	2	36	2	QUOTATION: "CO2 from Forestry and Other Land Use (FOLU)" COMMENT: Please consider adding "mainly due to deforestation" to the scentence. [Government of Norway]	Rejected, not needed here
Topic 1	36	2	36	6	This is the first mention of FOLU. Suggest clarifying the distinction between FOLU and AFOLU either here or at the first mention of AFOLU on page 37. This was a re-curring point of confusion in the WGIII SPM, so clarification throughout the text may be helpful. [Government of Canada]	Accepted. Footnote has been added.
Topic 1	36	4	36	4	Figure 1.3 GtC yr-1 should be [GtC/yr] and Gt yr should be [Gt/yr] [Government of United States of America]	Units made consistent throughout doc
Topic 1	36	4	36	4	Provide error bars in Figure 1.3. [Government of United States of America]	Accepted.
Topic 1	36	4	36	5	Flaring is not in the legend for the graph, is this included? [Elvira Poloczanska, Australia]	Accepted, figure revised.
Topic 1	36	4	36	6	Change units of figure to GtCO2, as used in text which refers to this figure (lines 1-3). [European Union]	Accepted.
Topic 1	36	4			The first entry in the legend in Figure 1.3 needs to include "flaring" to make it consistent with the figure caption as well as the text in line 1 of page 36. [Government of New Zealand]	Accepted.

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Topic 1	36	4			Figure 1.3. This figure shows annual CO2 emissions, but the discussion in the preceding paragraph where it is referred to (pg 35, ln 21 to pg 36, ln 3) is about cumulative emissions. The text notes that about half of anthropogenic cumulative CO2 emissions in last 40 years, but this can't be seen from the figure. Consider replacing this figure with one showing cumulative emissions. [Government of Canada]	Accepted.
Topic 1	36	5	36	5	The "2" of CO2 should be a subscript [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
Topic 1	36	5	36	6	The units in this figure need to be GtCO2 to correspond to the rest of the SYR. [European Union]	Accepted.
Topic 1	36	6	36	6	FOLU abbreviation is redundant. Remove [Government of Netherlands]	Rejected, both are needed here
Topic 1	36	6	36	6	"gigatonnes" should be written in singular form (usually units are not written in plural form) [Thomas Stocker/ WGI TSU, Switzerland]	Accepted
Topic 1	36	6	36	6	A connection word is missing in front of "1750-2011" [Thomas Stocker/ WGI TSU, Switzerland]	Accepted, word added
Topic 1	36	6	36	6	Gt/yr should be GtC yr <sup>-1</sup> (C is missing and according to the WG units convention per year is yr <sup>-1</sup> and not /yr) [Thomas Stocker/ WGI TSU, Switzerland]	GtCO2 now used
Topic 1	36	6			add C to a unit "(GtC/yr) [Government of Netherlands]	GtCO2 now used
Topic 1	36	8	36	8	To which anthropogenic CO2 emissions is the word "these" referring to? Consider deleting it or provide to which anthropogenic CO2 emissions is it being referred to. [Government of Netherlands]	Text clarified
Topic 1	36	8	36	8	it is not about half, but about 40% of the cumulative CO2 emissions remained in the atmosphere. [Monika Rhein, Germany]	Accepted, 40% not stated
Topic 1	36	8	36	9	Consider revising this sentence for clarity: About half of anthropogenic Co2 emissions since 1750 remained in the atmosphere in [year?] (880 ± 35 GtCO2). [Government of Canada]	Not needed here, year is obvious
Topic 1	36	8	36	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: 240 +- 10 PgC -> 880 +- 37 (instead of 880 +- 35); 160 +- 90 -> 587 +- 330 (instead of 585 +- 330). Thus, consider revising it and refer to WGI not WGIII). See also comment 1, 35, 22 - 1, 36, 3 [Government of Netherlands]	Accepted. Numbers taken from WG1 and converted to CO2.
Topic 1	36	8	36	12	• SYR [P36 L8-12] Insert uncertainties [Government of Saudi Arabia]	Main uncertainties added
Topic 1	36	8	37	17	Much of the numbers can also be found on Figure 1.5 that is much easier to read. If you add +- values (and possibly emission values) to the chart most of the text becomes redundant and could be deleted. [Government of Hungary]	Taken into account. Text has been simplified.
Topic 1	36	8		40	This information is better to presented in a table format. As running text it is unreadable. [Government of Sweden]	Text shortened and clarified
Topic 1	36	8			"About half of ..." should be replaced by "Nearly half of ..." , because 880 Gt is clearly less than half of 2035 Gt. [Government of Norway]	Accepted, 40% not stated
Topic 1	36	9	36	9	The rest were removed (emissions and not emission so they are plural) [Peter Thorne, Norway]	Accepted
Topic 1	36	10	36	10	no statement on confidence [H-Holger Rogner, Austria]	Highlighted confidence
Topic 1	36	10	36	10	Is this "only" virtually certain or even more so and can be stated as a fact? [Government of Sweden]	This is from WG1

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Topic 1	36	10	36	11	It is not clear that the phrase "since pre-industrial times" is needed at the end of the sentence. It makes more sense if the sentence ends at "atmosphere" [Government of New Zealand]	Accepted
Topic 1	36	10			suggest to highlight "virtually certain" by using italics [Government of Hungary]	Highlighted confidence
Topic 1	36	11	36	11	change "this estimate ..." to : "Ocean uptake was $570 \pm 110$ GtCO <sub>2</sub> between 1750 and 2011." [Government of Netherlands]	Accepted
Topic 1	36	12	36	12	The original sentence refers that the soils are those not affected by land use change (WGI, chapter 6 - Executive summary, page 467 (483 from the pdf)), so not all soils. So consider adding the following to this sentence in the SYR, after "soils": "not affected by land use change" [Government of Netherlands]	Rejected, too detailed here
Topic 1	36	12	36	12	The number given for storage in terrestrial biosphere is not compatible with SPM WG1 ist not 585 Gt CO <sub>2</sub> , but 547 (i.e. rounded to 550 Gt CO <sub>2</sub> ) [Monika Rhein, Germany]	Reject. Statement is wrong.
Topic 1	36	12	36	12	There has been a large confusion about the century half life time for CO <sub>2</sub> . 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. We suggest adding words explaining that the sinks are not there forever. [Government of Belgium]	Reject. Topic 1 is about past changes only.
Topic 1	36	14			Change to: "Total annual anthropogenic GHG emissions have..." [Government of Netherlands]	Accept.
Topic 1	36	15	36	15	"Despite" - I think this is unacceptable. Many countries have indeed met their Kyoto Protocol obligations and this style of writing that leads the reader to infer that international policy has been a complete failure is misleading and needs more nuancing. Much of the growth in emissions has been from countries outside of the Annex 1 group. [Keith Shine, United Kingdom]	Rejected, this wording is from WGIII SPM
Topic 1	36	15	36	18	WGIII 5.2 (p. 9, l. 11-12) states: "Total GHG emissions increased by 8 GtCO <sub>2</sub> eq over the 1970s, 6 GtCO <sub>2</sub> eq over the 1980s, and by 2 GtCO <sub>2</sub> over the 1990s". This implies a $(8 + 6 + 2) / 30 \approx 0.5$ GtCO <sub>2</sub> increase per yr instead of 0.4. So recalculate. [Government of Netherlands]	Reject. Numbers were checked and are correct
Topic 1	36	15	36	18	"...annual GHG emissions grew on average by 1.0 giga tonne carbon dioxide equivalent (GtCO <sub>2</sub> eq)(2.2%) per year from 2000 to 2010....." is as same as the description on Lin 12-16, Page 38, "Annual anthropogenic GHG emissions have increased by 10 GtCO <sub>2</sub> eq between 2000 and 2010....." [Songli Zhu, China]	Agreed
Topic 1	36	18	36	18	Indicate which WG report the references in footnote 6 refer to {3.9.6, Box TS.5, Annex II.2.9, } [Government of Netherlands]	Accept. References clarified by referring to metrics box in topic 3.
Topic 1	36	18	36	18	Consider removing footnote 7 from this report. Uncertainty interval is stated earlier and it is confusing that GHG emissions are rounded to 2 significant digits because this differs with the underlying background reports and is not consistent throughout the SYR. [Government of Netherlands]	Accept. This is included in relevant captions.
Topic 1	36	18	36	18	Footnote 6 and throughout the report. Why have SAR GWPs been used? Seems strange to me, since the AR5 ones have been long available and AR4 ones are to be used in the KP second reporting period. At the very least, the footnote needs to say something like "use of AR5 values would change these estimate CO <sub>2</sub> -equivalents by approximately x%". [Keith Shine, United Kingdom]	Accept. Caption expanded and reference to metrics box added

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Topic 1	36	22	36	22	Unclear if fossil fuel combustion and industrial processes contribute to 78% of total (i.e. including natural) OR total anthropogenic GHG emission. [Government of Netherlands]	Taken into account. Text revised.
Topic 1	36	22	36	30	This paragraph is a little unclear. It says CO2 emissions from fossil fuel combustion contributed 78% of total GHG emission increase from 1970-2000, and a similar contribution for 2000-2010. The text then switches to talk about growth of fossil fuel related GHG emission from 2010-11 and 2011-12 (3% and 1-2% respectively). To help maintain clarity/consistency, suggest indicating what percentage of overall GHG emissions increase these fossil fuel emissions represent. Is the percentage of fossil fuel related GHG emissions contributing to emissions growth increasing, decreasing or still holding steady? [Government of Canada]	Taken into account. Text revised.
Topic 1	36	25	36	25	Looking at changes from one single year to the next seems to be focusing on short-term noise. Better to look at changes between longer time windows. [Government of United States of America]	Taken into account. Text revised to de-emphasise short-term changes.
Topic 1	36	30	36	30	Consider removing footnote 8 from SYR, because the reference to EDGAR database doesn't add much to the reader. However, if it is kept in the SYR, then include the correct reference for EDGAR database, because Annex II.9 is not in the SYR but in one of the background reports. [Government of Netherlands]	Accept. Reference clarified.
Topic 1	36				In footnote 8 the reference to the Annex II is from the AR5 WG3 report I think; if so then this should be stated. Furthermore, it would be better if emission estimates were compared/synthesized between AR5 WGI and WGIII where possible and draw from the primary literature noting any important differences. [Haroon Kheshgi, United States of America]	Accept. Reference clarified.
Topic 1	37	0	37	0	The original graph (WGIII Figure SPM.1 / Figure 1.3) is more accurate on 1 decimal level. Using the original values would be more consistent with the text, e.g. SYR p. 36, l. 16 states 2000-2010 annual average of 1.0 GtCO <sub>2</sub> eq, which is consistent with WGIII Figure SPM.1 (9.5 Gt in 10 years), but not with SYR Figure 1.4 (9 Gt in 10 years). In addition the way the percentages are shown now, they don't give a total of 100% as they should. [Government of Netherlands]	Reject. This is the WG3 SPM graph. The issue arises due to rounding and is clarified in a footnote.
Topic 1	37	0			Figure 1.4 : Both in figure and caption /yr should be yr <sup>-1</sup> , and in the figure parenthesis should be used instead of bracket around units [Thomas Stocker/ WGI TSU, Switzerland]	Accepted; citation lined up with style guide
Topic 1	37	1	38	1	Figure 1.5: This figure is not cited any part of the section 1.3, although the sentences (line 8-37 in page 37) are explained this figure. Therefore the indication (Figure SPM.2) will be better to amend as Figure 1.5. [Government of Republic of Korea]	Taken into account. Figure revised; units made consistent. Callout added.
Topic 1	37	3	37	3	QUOTATION: "CO2 from Forestry and Other Land Use (FOLU)" COMMENT: Please consider adding "mainly due to deforestation" to the scentence. [Government of Norway]	Reject. This is nothing we highlight in WG3 summary material.
Topic 1	37	6	37	6	It is missing in this caption how the non-CO2 gases were converted into CO2-equivalent emissions in 2010. Please provide this information here or in a footnote [Government of Netherlands]	Taken into account. Figure revised; units made consistent.

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Topic 1	37	8	37	8	"GHG emissions have increased by {10} [9] GrCO2eq..." [Government of United States of America]	Reject. Not clear what is meant by this comment. The 10GtCO2eq is a rounded number and as such
Topic 1	37	8	37	8	It also says 10Gt in the WGIII SPM.2 (probably rounded), but from the figure 1.4 just above the increase seems to be 9 Gt, so seems inconsistent. Suggestion: add "almost" in addition to putting the 49.5 Gt back in the figure like it is in the SPM figure. [Government of Netherlands]	Reject. This is due to rounding. We have added a footnote for clarification as in WG3 SPM.
Topic 1	37	8	37	8	on page 36 line 16 it is stated an annual GHG emission increase by 1.0 GtCO2eq per year between 2000 and 2010. How come that on this line it says annual increase by 10 GtCO2eq? It might be meant that Total anthropogenic GHG emissions increased, but not saying that annual GHG emissions increased. [Government of Netherlands]	Accept. We have added the word "total" for clarification.
Topic 1	37	8	37	11	"Annual anthropogenic GHG emissions have increased by 10 GtCO2eq between 2000 and 2010....." is basically as same as the description on Line 15-18, Page 36, "...annual GHG emissions grew on average by 1.0 giga tonne carbon dioxide equivalent (GtCO2eq)(2.2%) per year from 2000 to 2010.....". It's better to delete it. [Songli Zhu, China]	Reject. This finding is about how individual sectors have contributed to this increase.
Topic 1	37	8	37	11	Since there are uncertainty it is relevant to add "about" before "10Gt" in this sentence to indicate the uncertainty. [Mingshan SU, China]	Accept
Topic 1	37	8	37	11	This sentence should give a expression of uncertainty, e.g., add "approximately" near "10GtCO2eq" [WENJIE DONG, CHINA]	Accept
Topic 1	37	8	37	11	10GtCO2eq was increased during 2000-2010, which is duplicated at L16-27P36. Please remove! [WENJIE DONG, CHINA]	Reject.
Topic 1	37	8	37	11	• SYR [P37 L8-11] add Agriculture sector [Government of Saudi Arabia]	Reject. This is approved text. AFOLU was left out, because it is unclear whether emissions have
Topic 1	37	8	37	17	It is not very scientific to pick two data points, 2000 and 2010, for a comparison without considering short-term changes. If the two years were 1997 and 2007, the numbers and the conclusions would be very different. It is suggested that trend values are used in order to avoid that IPCC is charged with making a dirty game with statistics. The same is suggested for all other situations where short term changes are assessed. [Government of Hungary]	Reject. This has been discussed at length during WG3 approval. IPCC assessment focus on the new literature and much of this literature concentrates on most recent emission changes. This is
Topic 1	37	9	37	10	The total percentage for sectors is 91%, missing 9%. [Government of Netherlands]	Reject. This is correct, but has been discussed at length during WG3 approval session. 9% are from AFOLU, but literature say different things about emission
Topic 1	37	10	37	11	What is meant by "indirect emissions"? This phrase is used elsewhere in the SYR, and it needs explaining. [European Union]	Reject. Indirect emissions are explained in the text. The term is
Topic 1	37	11	37	12	Suggestion: remove " Since 2000, GHG emissions have been growing in all sectors, except AFOLU" because it is clear from the sentences above and could cause some confusion about what happened before 2000. [Government of Netherlands]	Reject. This is approved WG3 language and has been discussed at length during approval session. There is a diverse literature on

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Topic 1	37	11		14	The total percentage is 100.4%. Also why have 6.4% with one decimal? [Government of Netherlands]	Accept. We round to two significant digits to represent uncertainty adequately.
Topic 1	37	12	37	12	"...except AFOLU [not quite true; 2008" 2008 were higher due to destruction of Indonesian jungles to grow Palm Oil] [Government of United States of America]	Reject. This is approved WG3 language and has been discussed at length during approval session. There is a diverse literature on
Topic 1	37	12	37	12	AFOLU should be defined here which is, I believe, its first use in the underlying text. [Peter Thorne, Norway]	Accept. Footnote added and acronym written out.
Topic 1	37	12	37	12	add the meaning of the acronym AFOLU [Government of Netherlands]	Accept.
Topic 1	37	12			AFOLU not defined; first time used. Is the intent to use both AFOLU and FOLU acronyms? If so, there will be a need to indicate how they are different. [Stewart Cohen, Canada]	Accept. Footnote added
Topic 1	37	12			Should this be "AFOLU" or "FOLU" (to be consistent with the caption of Figure 1.4). If AFOLU, please provide an expansion for this acronym in parentheses, since this is the first time it has been used. [David Wratt, New Zealand]	Accept. Explanation added.
Topic 1	37	14	38	17	The paras on P 37 L 14-20 and on P 38 L 8 -17 have some duplications, please straighten up text. [Government of Germany]	Reject. It is important to keep it as is.
Topic 1	37	17	37	17	'Figure SPM.2' should be 'Figure 1.5' [Government of Japan]	Accept
Topic 1	37	17	37	17	Refer to Figure 1.5 instead of Figure SPM.2. [Government of Netherlands]	Accept
Topic 1	37	17	37	17	Here is mentioned 31 and 19% for industry and buildings, while it says 32 and 18% in WGIII SPM.2 p.10-11 and It says 19% for buildings in WGIII 9.2 and just over 30% for industry in WGIII. These values are not consistent. Suggestion: to check the ones that are the most accurate and use those. [Government of Netherlands]	Numbers are correct
Topic 1	37	17	37	17	Figure SPM.2: is this reference meant to be WGIII Figure SPM.3? [Lena Menzel, Germany]	Reject. It is meant to be Figure 1.5
Topic 1	38	0	38	0	This figure is adjusted from WGIII Figure SPM.3. However, some of the values don't match: "Energy 1.4%" is 1.08% in the original and "AFOLU 0.87%" is 0.88% in the original. [Government of Netherlands]	Numbers checked
Topic 1	38	0	38	0	Change the percentage value of AFOLU in the pull-out of the graph (under the indirect CO2 emissions) to 1 decimal case only. [Government of Netherlands]	Reject. This is consistent with WG3 two digit rounding approach.
Topic 1	38	0	38	0	Add to the title of the graph "in 2010", after "Sectors [Government of Netherlands]	Reject. The reference to the year is included in the figure and does
Topic 1	38	0	38	0	Figure 1.5: is it intentionally that some percentages such as 1.4, 0.87, 9.6 seem to be very precise numbers, whereas other numbers are rounded? Please check for consistency with WGIII figure SPM.3 and WGIII figure 1.3 [Lena Menzel, Germany]	Reject. All rounded to two significant digits.
Topic 1	38	0			Figure 1.5 : Is It written in the bottom "Direct emissions" and "indirect CO2 emissions". CO2 should be written or in both, or not at all, but the 2 should be consistent. Also, CO2eq should be written CO2-eq [Thomas Stocker/ WGI TSU, Switzerland]	Reject. We only have indirect emission estimates for CO2 - not for non-CO2 emissions.
Topic 1	38	1	38	1	Comments on Figure 1.5:Put direct emission and indirect emission in the same figure will cause confusing. [Mingshan SU, China]	Reject. It is important to highlight multiple perspectives on historic

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Topic 1	38	1	38	1	The caption of Figure 1.5 should specify the year 2010. The text for the sectors in the Figure should be enlarged. [Government of Switzerland]	Reject. The caption contains the reference to 2010.
Topic 1	38	2	38	10	Figure caption : the sentence "Total anthropogenic GHG emissions (GtCO <sub>2</sub> eq/yr) by economic sectors" should be "Total anthropogenic GHG emissions by economic sectors in 2012 (GtCO <sub>2</sub> -eq)". This is more clear in consistent with the units given in the figure. Also, CO <sub>2</sub> eq should consistently be written as CO <sub>2</sub> -eq The sentence "Inner circle shows direct GHG emission shares (in % of total anthropogenic GHG emissions) " seems confusing -- the orange part of the inner circle is actually the indirect emissions [Thomas Stocker/ WGI TSU, Switzerland]	Reject. Emissions are reported for 2010. We clarify the caption further.
Topic 1	38	6	38	6	What is [A.II.9.1]? Annex of the SYR or annex of WGIII because this caption is a copy-paste from WGIII ? Same comment for the "Annex II.9" on line 10. If it is WGIII annex, it should be specified and written between braces {}. [Thomas Stocker/ WGI TSU, Switzerland]	Accept.
Topic 1	38	6	38	7	AFOLU indicated in Figure 1.5, while FOLU indicated in earlier figures (see earlier comment on page 37). The figure caption refers to both as well as Chapter 11 (is this WGIII?). Suggest a footnote indicating the differences between AFOLU and FOLU, citing sources within WGI and WGIII. [Stewart Cohen, Canada]	Accept. Footnote added.
Topic 1	38	6	38	10	References to Annex II, chapter 11 and annex II.9 should be removed altogether or substituted with references to the original background reports. [Government of Netherlands]	Accept. Reference to WG3 clarified.
Topic 1	38	9	38	9	The superscripted number "6" after GWP100 doesn't seem to mean anything. Delete it or put the appropriate footnote in [Government of Netherlands]	Reject. This is an important clarifying footnote.
Topic 1	38	10	38	10	The correct reference is WGIII Figure SPM.3. [Government of Netherlands]	Reject. This is the correct
Topic 1	38	10	38	10	WGIII Figure SPM.2: should this be WGIII Figure SPM.3? [Lena Menzel, Germany]	Reject. The reference is correct.
Topic 1	38	12	38	12	The largest share is an unclear expression (even with the following detail.) A "large share"? [Government of Sweden]	Reject. Finding has been removed due to space constraints.
Topic 1	38	12	38	13	To include what is in red. Regardless of the perspective taken, the largest share of anthropogenic CO <sub>2</sub> emissions is emitted historically and irrespective of the period by a 12 small number of countries [Government of Bolivia]	Reject. Finding has been removed due to space constraints.
Topic 1	38	12	38	14	Please keep this statement explaining that most emissions occur in a very limited number of countries. It is very policy relevant statement. [Government of Germany]	Reject. Finding dropped due to space constraints.
Topic 1	38	12	38	16	Suggest inserting "Regional patterns of GHG emissions are shifting along with changes in the world economy." to the headline. (WG3 TS) [Government of Japan]	Reject. This section is too space constrained to add further material.
Topic 1	38	12	38	16	The conclusion that in 2010, carbon dioxide emitted by 10 countries from industrial and fossil fuel combustion accounted for about 70% is too one-sided. It is suggested to add information on their population share in the world total and their difference in per capita emission, or just to delete the paragraph. [Government of China]	Accept. Paragraph has been deleted for space constraints.



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Topic 1	38	12	38	16	the paragraph will make "the small number of countries" be blamed and guilt. It is better to delete it. [Songli Zhu, China]	Accept. Paragraph has been deleted for space constraints.
Topic 1	38	12	38	16	Recommend reviewing this wording against the final wording in the WGIII SPM and underlying WGIII report. The underlying WGIII report refers to the number of countries accounting for 25% of emissions. The phrase in the second sentence stating "a similarly small number..." is too vague and should be replaced with more specific info or removed. [Government of Canada]	Reject. The WG3 SPM does not contain that finding. It is part of the TS, but excluded here for space constraints.
Topic 1	38	12	38	16	It would be fair to also mention the CO2 emissions on per capita basis, because of the very different sizes of countries. It is clear that large countries tend to have high total amount. But small ones can have high per capita emissions, although the total may be small. They have equal responsibility to reduce the CO2 emission as the large countries. [Government of Switzerland]	Reject. Report too sace constrained to add further detail.
Topic 1	38	13	38	14	Request addition of "(9 countries and 1 regional economic integration organization)" after "10 countries," in line with statement from UNFCCC(*) which reads, "Currently, there are 196 Parties (195 States and 1 regional economic integration organization) to the United Nations Framework Convention on Climate Change."  *: <a href="http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php">http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php</a>  Alternatively suggest maintaining text from AR5 WGIII Ch1, p3, lines 42-43:  Treating the 27 members of the EU as a single country, about ten large countries—from the industrialized and developing worlds—account for 70% of world emissions. (robust evidence, high agreement) [1.3]. [Government of Japan]	Reject. Paragraph deleted due to space constraints
Topic 1	38	13	38	16	"consumption-based CO2 emissions" should be explained for readers. [Keigo Akimoto, Japan]	Reject. Paragraph deleted due to space constraints
Topic 1	38	14	38	16	Mixed tenses. Emit is a present tense use and emitted is the past tense. The first part is about present behavior so emit is correct but the second part is about historical behavior. We have emitted those CO2 molecules we are not in the process of emitting them so this sentence as written at least from a tautological perspective makes no sense and therefore needs to be rewritten. [Peter Thorne, Norway]	Reject. Paragraph deleted due to space constraints
Topic 1	38	15	38	15	The largest share is an unclear expression (even with the following detail.) A "large share"? [Government of Sweden]	Reject. Paragraph deleted due to space constraints
Topic 1	38	15	38	15	An explanation is needed - the statement of what is "consumption-based CO2 emissions" especially for those read SYR only. [Government of Japan]	Reject. Paragraph deleted due to space constraints
Topic 1	38	16	38	17	Suggest adding a figure showing anthropogenic CO2 emissions by country. [Government of Italy]	Reject. Paragraph deleted due to space constraints

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Topic 1	38	18	38	24	Suggest being specific about the increased use of coal relative to other forms of energy. Does this apply to 2000-2010? Or another time frame? And what is the time frame of the longstanding trend of decarbonization? [Government of Canada]	Reject. The time reference is clear due to the figure reference.
Topic 1	38	19	38	21	time reference unclear for economic growth. Suggestion to reformulate into: "In the last decade the contribution of population growth remained roughly the same as in the previous three decades, while the contribution of economic growth has risen sharply (high confidence)." [Government of Netherlands]	Reject. We prefer to stick with the approved language from the WG3 SPM.
Topic 1	38	20	38	20	change "roughly identical" to "roughly the same" (identical sound very precise while roughly isn't) [Government of Netherlands]	Reject. We prefer to stick with the approved language from the WG3
Topic 1	38	20	38	20	"roughly" is ambiguous word. Maybe rather use "almost" or even take this word out. [Government of Netherlands]	Reject. We prefer to stick with the approved language from the WG3
Topic 1	38	21	38	21	how much sharply risen? Be more specific to avoid ambiguity. [Government of Netherlands]	Reject. This becomes clear from the figure. This is a high level
Topic 1	38	22	38	22	add .. Energy intensity of GDP [Monika Rhein, Germany]	Accept
Topic 1	38		38		Could you include a figure showing how the split in emissions per sector differs between high and low income countries? This is important to communicate. [Government of United Kingdom of Great Britain & Northern Ireland]	Reject. We decided to exclude regional information at this highest level of synthesis.
Topic 1	38				use same number of decimal spaces for numbers. [Government of Netherlands]	reject, 2 sig fig used
Topic 1	38				Figure 1.5 The labels are very faint. Consider enhancing them [Government of Kenya]	accepted
Topic 1	38				• SYR [P38 Figure 1.5] Add Agriculture as economic sector and respective GHG emissions [Government of Saudi Arabia]	Reject. It is present as AFOLU - consistent with WG3 report.
Topic 1	39	0			Figure 1.6 : It is not fully clear if the different colors bar have to be read in absolute (from 0) or with respect to the one below (as in Figure 1.4). [Thomas Stocker/ WGI TSU, Switzerland]	Noted.
Topic 1	39	0			Figure 1.6 :Units should be "GtCO <sub>2</sub> per decade", and written between parenthesis [Thomas Stocker/ WGI TSU, Switzerland]	Accepted. Axis label corrected.
Topic 1	39	1	39	7	Unclear legend: Change in emissions relative to when? What is energy intensity of GDP? CO <sub>2</sub> or CO <sub>2</sub> equivalents? suggestions: explain "energy intensity of GDP" (=total primary energy supply per GDP) in the text and also explain what the change is relative to. [Government of Netherlands]	Reject. Figure is clear.
Topic 1	39	4	39	5	Suggestion to re-phrase into " The size of the segment represents the amount of increase or decrease in the decadal change". [Government of Netherlands]	Reject. Language is clear.
Topic 1	39	5	39	5	unclear choice of words "holding the respective other factors constant." Provide a clearer alternative to express what is meant by this. [Government of Netherlands]	Reject. Language is clear and approved.
Topic 1	39	7	39	7	The correct reference for the figure is WGIII Figure TS.6. [Government of Netherlands]	Reject. Figure reference correct.
Topic 1	39	7	39	7	WG III SPM.3: should this be WG III SPM.6? [Lena Menzel, Germany]	Reject. Figure reference correct.
Topic 1	39	10	39	15	The text of section 1.4, which appears inside the box, is repeated on page 40 in section 1.4.1, it seems redundant, because it too often. [Government of Costa Rica]	Text has been revised, but some repetition is unavoidable as one moves up the levels of

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Topic 1	39	11	39	12	This statement is not consistent with the language used in the WGI SPM which says "human influence has been detected in ...etc." . Here the text says "human influence has been detected and attributed in....etc." Justification for the differences in language between the WGI SPM and this SYR will need to be included in the text unless the SYR text is revised to be consistent with the WGI conclusion. [Government of Canada]	Accepted, statement is revised to be consistent
Topic 1	39	11	39	15	This phrasing captures the essence of the entire Topic 1. I think it should be used in the summary with some supporting details. [Government of United States of America]	Thanks, we trust that this can also be said about the now revised text. The SPM text now contains
Topic 1	39	13	39	13	Suggested edit for clarity: "...sea level rise; and IT IS LIKELY TO HAVE BEEN the dominant cause..." [Government of United States of America]	accepted, sentence revised
Topic 1	39	13	39	13	has been' and 'been' are repeated. Please revise sentence. [Government of France]	accepted, sentence has been revised
Topic 1	39	13	39	13	The first "been" should probably be deleted. [Government of Sweden]	accepted, sentence has been
Topic 1	39	13	39	13	consider deleting the word "been" after "likely" [Government of Kenya]	accepted, sentence has been
Topic 1	39	13	39	13	Remove the repetition in 'and has been extremely likely been the dominant cause of [...]' [Government of Switzerland]	accepted, sentence has been revised
Topic 1	39	14	39	15	Please consider to rephrase this sentence "Changes in climate have caused impacts on natural and human systems on all continents and across the oceans, as observed in recent decades.". As it is now it is not clear if climate change has first caused impacts in recent decades, or if the impacts are first now in recent decades large enough to be detectable. [Government of Norway]	Now using standard WGII SPM phrase
Topic 1	39	14	39	15	There is no likelihood statement attached to this statement on impacts. A likelihood or confidence qualifier is needed. [Government of Canada]	Similar to the WGII SPM, it was not found to be possible to assign one single uncertainty level to all systems - some have high
Topic 1	39	17	39	19	Please consider rephrasing this sentence to read. "The relationship between changes in the climate system, as well as in any natural or human system, and their causes are established following a consistent ...". Rationale: At the moment the sentence can be misinterpreted to say that observed changes in the climate system is caused by climate. As a minimum the current formulation needs a comma after ".... by climate" in line 18. [Government of Norway]	see response to T1-35; section has been revised
Topic 1	39	17	39	39	I found this whole section hard to follow and somewhat repetitious. It could be redrafted to something shorter and with fewer caveats. I have no immediate, specific, suggestions to this end but wanted to note that I found this passage as stands unduly hard to parse. [Peter Thorne, Norway]	The entire section has been deleted and replaced by a shorter introduction of these matters, based on the cross WG IPCC
Topic 1	39	19	39	19	No references provided in this draft - what is IPCC GPGP?? [H-Holger Rogner, Austria]	Reference has been fixed by adding a footnote
Topic 1	39	19	39	20	Cross-check the clarity of the statement. [Government of United Republic of Tanzania]	see response to T1-35

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Topic 1	39	19	39	21	<p>The description of "detection" and "attribution" could benefit from more clarification: It is now unclear in which order detection and attribution analyses are performed and which data are included in the respective analyses. Since a change needs to be detected before it can be attributed to a causal factor, detection could be described as follows : "Detection addresses whether a change in a natural or human system can be detected in a statistical sense". Thereby it is clear that detection addresses whether a change has been observed with statistical confidence regardless of cause and whether the cause is known or not. For "attribution" it is unclear whether this analysis evaluates relative contributions of several climatic factors, or multiple factors in general (such as e.g. habitat modification, pollution, overexploitation and alien species for biological systems, or e.g. economic, political or demographic factors for human systems). Please consider to clarify this in the sentence.</p> <p>[Government of Norway]</p>	See response to T1-35; section has been revised, balancing the level of detail possible in a short document with clarity
Topic 1	39	19	39	22	<p>Lines 19 and 22 refer to "IPCC GPGP, 2020" - this reference is not expanded anywhere. Replace by reference to a WG chapter/section instead if possible, or expand the reference. [European Union]</p>	See T1-152
Topic 1	39	19	39	22	<p>The wording of the first part of this sentence is unclear. Suggest: Climate change is detected when a statistical change occurs in the climate or a natural human system affected by the climate, whilst attribution evaluates... [Government of United Kingdom of Great Britain &amp; Northern Ireland]</p>	see response to T1-35; note that definitions are based on a cross WG guidance paper
Topic 1	39	19	39	22	<p>Could not find a reference list for this draft and IPCC GPGP is not familiar...it needs a reference. [Haroon Kheshgi, United States of America]</p>	see response to T1-35
Topic 1	39	19		20	<p>"Detection addresses the question of whether climate 19 or a natural or human systems affected by climate .." this part of the sentence is unclear [Government of Hungary]</p>	See response to T1-35
Topic 1	39	20	39	20	<p>"In a statistical sense" is probably unnecessary here. May be confusing. [Government of Sweden]</p>	see response to T1-35; reference to statistics is necessary here for
Topic 1	39	20	39	20	<p>system and not systems here because its context is the singular and not the plural. [Peter Thorne, Norway]</p>	see response to T1-35

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Topic 1	39	20	39	20	<p>page 39, line 20: "..has actually changed in a statistical sense,..." should be changed to explain that the detection is relative to to our understanding of internal variability of the climate system. I would suggest using the words in the GPGP paper like...</p> <p>...climate has changed in observations if its likelihood of occurrence by chance due to internal variability alone is determined to be small, for example, &lt;10%.</p> <p>That way the detection does not sound arbitrary. Clearly this sentence should be there....</p> <p>page 39, line 20: "..has actually changed in a statistical sense,..." should be changed to explain that the detection is relative to to our understanding of internal variability of the climate system. I would suggest using the words in the GPGP paper like...</p> <p>...climate has changed in observations if its likelihood of occurrence by chance due to internal variability alone is determined to be small, for example, &lt;10%.</p> <p>That way the detection does not sound arbitrary. Clearly this sentence should be there....</p> <p>[Nathaniel Lee Bindoff, Australia]</p>	see response to T1-35. Note that definition section needs to work equally for impacts and climate change, and we have to balance content with length, hence ability to fully explain methods is limited
Topic 1	39	20	39	20	Systems should be system (without "s") [Government of Belgium]	see response to T1-35
Topic 1	39	20			Change "systems" to "system" [Government of New Zealand]	see response to T1-35
Topic 1	39	21	39	21	<p>Page 39, line 21, suggest replace "change" with "observed change"</p> <p>to be clear that we are trying to explain the observations....</p> <p>[Nathaniel Lee Bindoff, Australia]</p>	see response to T1-35
Topic 1	39	22	39	25	The meaning of "results from attribution studies support" is unclear. Please reformulate. [Government of Sweden]	see response to T1-35; cross reference has been added as full explanation is not possible given
Topic 1	39	23	39	23	please explain or rephrase "confounding factors" [Government of Denmark]	see response to T1-35
Topic 1	39	23	39	24	move {WGI 10} to after results from attribution studies, i.e. : " Results from attribution studies {WGI 10} support projections of future climate change (Topic 2), as well as...." - this chapter has to do with detection and attribution, not future projections (although 10.8 looks at implications for future projections) [Government of Netherlands]	Rejected, this is a brief crosslink explaining the role of attribution
Topic 1	39	27	39	27	This paragraph is an example of lack of synthesis in SYR. It seems there are good reasons for the different approaches of the two WG's, especially as the spatial scales of attribution required by WG2 may be below what can sensibly be done by WG1 - perhaps this could be made clearer? [Keith Shine, United Kingdom]	see response to T1-35

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Topic 1	39	27	39	28	How can a change be an impact before attribution to a cause has been made? Please consider rephrasing this to "Attribution of impacts to climate change considers the links between observed changes in natural or human systems and observed climate change..." or something similar. Furthermore, the wording "link" suggests that no quantification has been made in these cases. Is this the case? [Government of Norway]	see response to T1-35
Topic 1	39	27	39	39	These paragraphs help clarify what is meant by attribution and are essential. It is important that this is either given in the SPM or referred to when describing attribution results. [Haroon Kheshgi, United States of America]	see response to T1-35; note that SPM does not discuss methodological detail
Topic 1	39	29	39	29	"by contrast" instead of "by comparison"? [Keith Shine, United Kingdom]	see response to T1-35 - accepted
Topic 1	39	29	39	30	The phrase "human activity, as well as other external climate drivers" might be more clear if it were instead "human activity, as well as natural external climate drivers." [Government of United States of America]	see response to T1-35
Topic 1	39	30	39	33	Lists factors that are important for local AND regional scales, although starts off with "On local scales..". Change to "On regional or local scales...". Lists from WP1 TS4.8 and 10.6.1.2 [Government of Netherlands]	see response to T1-35
Topic 1	39	31	39	31	Perhaps this is a tautology - isn't the larger climate variability due to the greater role played by dynamical factors? It is written as if the variability and dynamics are distinct things [Keith Shine, United Kingdom]	see response to T1-35
Topic 1	39	33	39	33	"greater difficulty" - I am not sure about this - we are pretty good at modelling relevant processes on these scales from an NWP point of view. Where we have the difficulty is in modelling how these relevant processes will change as a result of climate change. [Keith Shine, United Kingdom]	see response to T1-35
Topic 1	39	33	39	34	This sentence is a bit hard to follow. Do you mean that linking observed changes in natural and human systems to human caused climate change is difficult, i.e. that it is difficult to separate the effects of human drivers from natural variation for these changes? If so, we believe that this is described well enough in the sentence prior to this, and you could consider to delete this sentence. [Government of Norway]	see response to T1-35
Topic 1	39	33	39	34	Page 39, line 33 to 34. Replace this sentence "This is why attribution.... are not easy to achieve." with something like "It is for these reasons that the attribution of the direct links of the impacts of climate change with human drivers can be difficult to achieve."  Sorry for the word smithing. [Nathaniel Lee Bindoff, Australia]	see response to T1-35
Topic 1	39	34			It is still for local scales? [Government of Hungary]	see response to T1-35
Topic 1	39	34			Suggest "achieve" is changed to "establish" [Government of New Zealand]	see response to T1-35

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Topic 1	39	36	39	37	There is a key distinction here between the WGI material where changes in climate are attributed to human influence, and the WGII material where impacts are attributed to climate change, but not necessarily to anthropogenic climate change. This important distinction could easily be missed by readers. Suggest replacing this sentence with 'section 1.4.2 discusses attribution of impacts on natural and human systems to observed changes in climate'. [Government of Canada]	see response to T1-405
Topic 1	39	36	39	39	This short paragraph introduces the following sub-sections but the same format was not used in the previous sections, e.g. 1.3. Either take it out or have it consistent across the report. [Government of Netherlands]	Paragraph has been removed
Topic 1	39				Fig 1.6. This figure is difficult to understand. [Government of Sweden]	Noted.
Topic 1	39				Figure 1.6. The colour key labels are faint. Consider some slight enhancement [Government of Kenya]	Final figure quality is better
Topic 1	40	1	41	43	Given the degree to which observational key findings have been thinned in 1.2 arguably some of these findings should be combined or removed. [Peter Thorne, Norway]	Section has been shortened
Topic 1	40	3	40	4	Same comment as per page 39 lines 11-12: This statement is not consistent with the language used in the WGI SPM which says "human influence has been detected in ...etc." . Here the text says "human influence has been detected and attributed in....etc." Justification for the differences in language between the WGI SPM and this SYR will need to be included in the text unless the SYR text is revised to be consistent with the WGI conclusion. [Government of Canada]	Accepted, text has been fixed
Topic 1	40	5	40	5	Figure 1.7 is misreferenced as Figure 1.6 in the text here and p. 41, line 13. This may be a more widespread problem than these two references or this figure. [Government of United States of America]	Accepted, Figure referencing has been fixed
Topic 1	40	5	40	5	"Figure 1.6"should be "Figure 1.7". [Government of Japan]	accepted
Topic 1	40	5	40	5	Incorrect figure reference: should be Figure 1.7 [Government of Netherlands]	accepted
Topic 1	40	5	40	5	Minor typo: The reference to Figure 1.6 is wrong. It should be "(Figure 1.7)". This is also the case for page 41 line 13, line 27, and line 34. [Government of Norway]	accepted
Topic 1	40	5	40	5	Change "Figure 1.6" to "Figure 1.7" (same in other sentences). [Toshihiko Takemura, Japan]	accepted
Topic 1	40	5	40	5	Page 40, line 5. The reference to figure 1.6 does not seem right here, do we mean figure 1.7? I could not easily find a refernece to figure 1.7 (with all of its panels) [Nathaniel Lee Bindoff, Australia]	accepted
Topic 1	40	5	40	5	Page 40, line 5. The reference to figure 1.6 does not seem right here, do we mean figure 1.7? I could not easily find a refernece to figure 1.7 (with all of its panels) [Nathaniel Lee Bindoff, Australia]	accepted
Topic 1	40	7	40	18	This figure seems fairly important and has an extensive description, but it is not referenced, explained, or synthesized to the rest of the content at any point in the text. Please consider incorporating into the discussion at one point and explaining its relevance. [Government of Germany]	figure is crossreferenced with text in three bullets, now with corrected numbering

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Topic 1	40	8	40	8	Figure 1.7 is the centerpiece of evidence for the contribution of man's activities to the warming trend and related effects. But it really looks busy. At the bottom there are 3 global averages, but they do not match the 3 panel types shown in the maps. This makes a case for cherry picking. It is understandable why there isn't a summary for sea ice, because the Antarctic behaves opposite from the Arctic and the mean would be close to zero. In that case, why not keep only the global mean panels (since the ones broken down by location all show the same thing) and just add the Arctic and Arctic sea ice. or skip the global average panels and make the figure bigger and easier to read. [Government of United States of America]	Rejected, figure illustrates role of forcing in continental and ocean-basin scale changes, and global averages relate to panels shown above
Topic 1	40	8	40	8	It is very peculiar that temperature and OHC are omitted for the Arctic; especially the Arctic is at the top Figure 1.7. For the Antarctic, it instigates the conundrum that Antarctic sea ice is increasing while both temperature and OHC have an overall increasing trend. [Government of United States of America]	rejected, figure based on WGI report where OHC is assembled across basins shown. Both Arctic and Antarctic sea ice are shown
Topic 1	40	8			In Figure 1.7 the word Central America is not written in the region where South America is located. Is this for lack of space?. [Government of Costa Rica]	Yes, only North and South American land regions are
Topic 1	40	11	40	11	I could not find "blue panels" in Figure 1.7. [Akihiko Murata, Japan]	rejected, figure as approved in WGI plenary with faint blue bg for
Topic 1	40	12	40	12	Baseline for temperatures is 1880-1919; change to 1850-1900 (preindustrial). Results may then be more easily compared with other figures in this report. [European Union]	rejected, many of the datasets are not available in sufficient quantity 1850 on, see WGI report
Topic 1	40	16	40	16	I do not see details in WG1 figure SPM6. Perhaps the details are in the underlying WG1 report which should be referenced here instead of the SPM. [Haroon Kheshgi, United States of America]	reference to TS figure added, where detail is given
Topic 1	40	21	40	21	To include what is in red. temperature from 1951 to 2010, considering the historical influence of accumulation of emissions. [Government of Bolivia]	Comment unclear
Topic 1	40				Figure 1.7 The tile labels are generally small and faint. Consider increasing the font size and also increase the size of the diagrams slightly [Government of Kenya]	Printed version quality improved
Topic 1	40				Figure 1.7 is referenced as Figure 1.6 throughout section 1.4.1. Please adjust. [Government of Switzerland]	accepted
Topic 1	41	4	41	4	For consistency with WG1-SPM, add word 'natural' before 'internal variability.' [Government of Japan]	accepted
Topic 1	41	5	41	5	"internal variability" - perhaps this should be linked to the hiatus and to Box 1.1 [Keith Shine, United Kingdom]	Reject -- would destroy logical flow.
Topic 1	41	9	41	10	has led to a detectable observed pattern of tropospheric warming and a corresponding cooling in the lower stratosphere since 1961: Year inconsistent/slightly unclear with text in WGI ch10 "have contributed to the warming of the troposphere since 1961 and very likely that anthropogenic forcings, dominated by the depletion of the ozone layer due to ozone-depleting substances, have contributed to the cooling of the lower stratosphere since 1979" Please reword to be more precise [Lena Menzel, Germany]	text consistent with WGI SPM
Topic 1	41	12	41	37	References to Figure 1.6 of SYR: this should this be Figure 1.7 instead [Lena Menzel, Germany]	accepted



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Topic 1	41	12	41	43	The ranges of the attributions should be specified whenever possible in the text. E.g., What is the range of the contribution of anthropogenic forces to the detectable observed pattern of tropospheric warming and a corresponding cooling in the lower stratosphere since 1961? To what extent that the anthropogenic influences have affected the global water cycle since 1960. The information may be found in Figure 1.7, but some key values in text can facilitate readers to have a quick grasp of the extent of the impacts. [Government of Switzerland]	Reject. Synthesis report is not meant to provide all quantitative detail, and much of the desired information is not available from WG1 Ch10.
Topic 1	41	13	41	13	'Figure 1.6' should be 'Figure 1.7' [Government of Japan]	fixed
Topic 1	41	13	41	13	Incorrect figure reference: should be Figure 1.7 [Government of Netherlands]	fixed
Topic 1	41	13	41	13	please check if the figure reference is correct. It seems that the reference should be figure 1.7 [Government of Denmark]	fixed
Topic 1	41	13	41	34	Figure 1.7: Indication of Figure 1.6 in this part means Figure 1.7. Please make this indication have right linkage. [Government of Republic of Korea]	yes
Topic 1	41	17	41	18	This sentence states that human influence has likely contributed ... However, sentence on p. 40, line 20 stated that humans extremely likely contributed to global warming. This sentence on line 17 should then should state that human influence has extremely likely .... to be consistent. [Government of Netherlands]	rejected, assessment is more uncertain for continental regions than for global data
Topic 1	41	20	41	24	I suggest to include some text saying to what extent the changed water cycle is responsible for the climate change. This is necessary as water vapour is a strong greenhouse gas itself and many critiques say that changes in water and clouds in the atmosphere offset the effects of GHGs. [Government of Hungary]	rejected, discussion of feedbacks here would destroy the flow and be too technical
Topic 1	41	20	41	40	The authors suggested specific years for the start of anthropogenic influence on climate changes and their results induced by the changes. It might be because the measurement on the climate change started in the year. The authors should have provided the readers with the reason why the specific years were given. It would be more realistic or more effective for the authors to use a range of time rather than the specific time (i.e. year) as climate change cannot start in a specific year but in specific years. [Young-june Choi, South Korea]	Footnote added with explanation
Topic 1	41	23	41	23	If we say "intensification of heavy precipitation over land regions where data are sufficient (medium confidence)", it means that in all the regions where there are enough precipitation data series heavy precipitation will increase. This is inconsistent with results found for different regions, as it is showed in WGII (i.e. Table SPM2, p. 21-23). Perhaps it could be written as "over some land regions" or "over a great part of land regions". [Maria Carmen Llasat, Barcelona]	Rejected, sentence refers to global watercycle and hence not to point timeseries but a global-scale tendency for intensification
Topic 1	41	23	41	23	intensification of heavy precipitation over land regions where data are sufficient (medium confidence): heavy precipitation is an "extreme event", and is discussed more detailed in this section1.5. Could remove here to avoid repetition [Lena Menzel, Germany]	taken into account, a cross-reference is added but this section talks to physical indicators of a changing watercycle
Topic 1	41	24	41	24	Change "WGI," to "WGI SPM," [Government of Japan]	SPM added
Topic 1	41	24	41	24	Missing SPM as an added reference (as has been done for other references on the page). It is an almost direct quote from the WG1 SPM [Government of Netherlands]	SPM added

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Topic 1	41	24	41	24	Missing reference: mentions attribution of changes of heavy precipitation, but no reference for this in the list. Suggestion: add WGI 10.6 to the list of references [Government of Netherlands]	added
Topic 1	41	24	41	24	Reference to WGI 2.6, what is "Changes in Extreme Events": above it is stated that extreme events are dealt with in part 1.5 of SYR. Check if reference to be removed here, and if heavy precipitation is here in the correct place to be mentioned [Lena Menzel, Germany]	see T1-713
Topic 1	41	24			to add that we need to strengthen monitoring systems data globally to improve levels of trust through cooperation in science and technology, especially in developing countries. [Government of Nicaragua]	rejected, beyond scope of IPCC report
Topic 1	41	27	41	27	Typo: 'Figure 1.6' should read 'Figure 1.7'. [Government of United States of America]	fixed
Topic 1	41	27	41	27	'Figure 1.6' should be 'Figure 1.7' [Government of Japan]	fixed
Topic 1	41	27	41	27	Incorrect figure reference: should be Figure 1.7 [Government of Netherlands]	fixed
Topic 1	41	27	41	27	please check if the figure reference is correct. It seems that the reference should be figure 1.7 [Government of Denmark]	fixed
Topic 1	41	29	41	31	Clarify that it is 'land-based' glacier mass loss. [European Union]	rejected, approved text
Topic 1	41	30	41	31	suggestion to re-phrase to: "... to sea level rise, which are thermal expansion and glacier mass loss." [Government of Netherlands]	sentence revised
Topic 1	41	30			Suggest the sentence be changes to read: "...the two largest contributions to sea level rise: thermal expansion of the oceans and glacier mass loss." [Government of New Zealand]	accepted
Topic 1	41	31	41	31	This statement about ocean acidification is "high confidence very likely" in WGI Chapter 10 ES and is given with high confidence in the WGI TS. Here in the SYR it is given without any confidence or likelihood qualification. [Peter Stott, United Kingdom of Great Britain & Northern Ireland]	accepted, confidence statement added
Topic 1	41	31			is it only glacier mass loss or also sea ice loss? I think sea ice loss is more important. [Government of Netherlands]	rejected, sea ice is not a contributor to sea level
Topic 1	41	34	41	34	'Figure 1.6' should be 'Figure 1.7' [Government of Japan]	fixed
Topic 1	41	34	41	34	Incorrect figure reference: should be Figure 1.7 [Government of Netherlands]	fixed
Topic 1	41	34	41	34	please check if the figure reference is correct. It seems that the reference should be figure 1.7 [Government of Denmark]	fixed
Topic 1	41	34	41	43	these paragraphs on ice and glaciers could be moved up directly after the warming paragraph. [Lena Menzel, Germany]	accepted, paragraph moved up
Topic 1	41	37	41	37	Change "WGI 10.5" to "WGI SPM 10.5," [Government of Japan]	accepted
Topic 1	41	37	41	37	Probably not "Figure 10.6" but "Figure 10.16". [Government of Japan]	fixed
Topic 1	41	37	41	37	Missing SPM as an added reference (as has been done for other references on the page). It is an almost direct quote from the WG1 SPM [Government of Netherlands]	fixed
Topic 1	41	37	41	37	Probably not "Figure 10.6" but "Figure 10.16". [Toshihiko Takemura, Japan]	fixed
Topic 1	41	37			to add that the low reliability of scientific information is generated by the lack of measurement tools that provide precise data on the behavior of the sea in coastal areas, mainly in developing countries. [Government of Nicaragua]	rejected., beyond scope of report

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Topic 1	41	39	42	12	Is the para on P 41 L 39 focusing on polar regions, and not on glaciers generally? Please clarify. In addition, it is peculiar to find statements on glaciers also on P 42 L 12, where the change is attributed to climate change but not to anthropogenic climate change. [Government of Germany]	Wording is used as approved; and refers to global glaciers as indicated in text. Different context to later impact statement on
Topic 1	41	40			Confusing to state "increased surface mass loss". Should it be just "decrease surface mass", which is clearer. [Government of Netherlands]	Wording used as approved in WGI plenary, rejected
Topic 1	41	43	41	43	Change "WGI," to "WGI SPM," [Government of Japan]	added
Topic 1	41	43	41	43	Missing SPM as an added reference (as has been done for other references on the page). It is an almost direct quote from the WG1 SPM [Government of Netherlands]	added
Topic 1	41	45	41	45	How can a change be an impact before attribution to a cause has been made? Please consider rephrasing this to either "Observed changes attributed to climate change" or " Observed impacts of climate change" [Government of Norway]	We prefer to leave the current phrasing as it seems to be the clearest
Topic 1	41	45	41	45	Observed impacts attributed to climate change: timeframes are used extremely sparsely in this section, if at all. Is it possible to include timeframes, at least for some observed changes? Few time frames are in the caption of figure 1.8 - is this sufficient for the entire section? [Lena Menzel, Germany]	The available evidence on observed impacts varies among studies. "Recent decades" is the only way this can be summarized
Topic 1	41	45	43	38	Observed impacts attributed to climate change not summarized in the SPM 1. We propose two choose one or more of the following conclusions: 1. In recent decades, changes in climate have caused impacts on natural and human systems on all 47 continents and across the oceans. 2. In many regions, changing precipitation or melting snow and ice are altering hydrological systems, 12 affecting water resources in terms of quantity and quality (medium confidence). 3. Many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal 5 activities, migration patterns, abundances, and species interactions in response to ongoing climate 6 change (high confidence). 4. Based on many studies covering a wide range of regions and crops, negative impacts of climate change 13 on crop yields have been more common than positive impacts (high confidence). 5. At present the world-wide burden of human ill-health from climate change is relatively small 26 compared with effects of other stressors and is not well quantified. 6. "Cascading" impacts of climate change from physical climate through ecosystems on people can now 32 be detected along chains of evidence. [Government of Netherlands]	These remarks have been considered during the reorganization of the section.
Topic 1	41	47	41	47	Add "observed" before "changes in climate" to make clear that the attribution of impacts is to observed climate change, irrespective of cause. [Government of Canada]	We prefer to keep the approved WGII SPM language. Also, attribution can only be made with respect to observed climate
Topic 1	41	47	41	48	the phrase "recent decades" is vague. Consider quantifying the decades [Government of Kenya]	see response to T1-716
Topic 1	41	49	41	49	See comment 1 regarding clarifying use of natural systems [Elvira Poloczanska, Australia]	We are unsure as to which comment 1 is referred to, and nonetheless we prefer to maintain

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Topic 1	41	49	41	51	The meaning of the sentence is not very clear. Does 'some impacts' refer to climate change impacts? [Government of Switzerland]	Yes, this entire section is about climate change impacts - just as its heading says. What else
Topic 1	41	51	41	51	Missing SPM as an added reference (as has been done for other references on the page). It is an almost direct quote from the WG2 SPM [Government of Netherlands]	Corrected
Topic 1	42	0	42	0	for two bottom figures, keep terminology the same : e.g. 75th percentile OR standard error. [Government of Netherlands]	We prefer to keep the figure as it is for consistency with the plenary
Topic 1	42	0	42	0	The 'warmer arrow cooler' could be removed - find them unclear. [Government of Netherlands]	see response to T1-424
Topic 1	42	0	42	0	Overload of information and confusing (e.g. multiple fish icons in Small Islands group). Suggestion: remove all regional-scale impacts, and any that have a confidence range, leaving only a selection of attributed impacts to make the message clearer that impacts have been attributed world wide [Government of Netherlands]	Our own considerations, and the balance of comments during multiple reviews as well as the WGII Approval Plenary, where the figure was enthusiastically
Topic 1	42	0	42	0	Some changes in location of some of the symbols from Figure 18-3 in WG2 (e.g. fires in S. America). [Government of Netherlands]	all locations will be identical in final printed version
Topic 1	42	0			Figure 1.8, Panel A ) The texts in the box requires revisions : "sea level effects" overlays the fish, "terrestrial ecosystem" overlays the tractor, "livelihoods, health" displays in a strange way, bottom right texts end beyond the box's edge Some boxes inside the figures are a bit too small for the inner text (North Am, central & south Am and small islands") [Thomas Stocker/ WGI TSU, Switzerland]	all technical layout aspects will be handled in final printed version
Topic 1	42	0			Figure 1.8, Panel B ) It is not entirely clear how to interpret the "distribution change in km". Suggest to clarify if this is always a move rather than an increase/decrease in area covered? [Thomas Stocker/ WGI TSU, Switzerland]	It is always an increase or shift in the boundary of the area covered - we prefer to retain the caption as
Topic 1	42	1	42	1	This figure is difficult to follow. The graphics are confusing and seem to contradict the text. For example Antarctica snow and ice have previously noted as being highligh uncertain in the text, yet this figure shows impacts with medium confidence. Further, coastal erosion and sea level graphic (ovserved 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 T1-425
Topic 1	42	1	42	1	The top panel of Figure 1.8 presents a very useful summary of observed climate impacts. But are all the impacts of climate change negative? For example, the impacts of climate change on food production of Europe is minor, but is it positive? Positive and negative impacts cannot be distinguished on this figure. [European Union]	There is intentionally no indication of negative or positive, as this would involve an assessment of values that is not normally made in the literature.
Topic 1	42	1	42	1	Figure 1.8. First panel. The legend 'indicates confidence range' is not needed as the text above already gives a clear indication. [Government of Switzerland]	Figure and caption are identical to the WGII approved versions.
Topic 1	42	1	42	10	Figure 1.8: Part A of this figure seems to present a coarse view of impacts around the globe, so it would be useful to highlight more clearly that this is representing formal attribution studies. [European Union]	see response to T1-425

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Topic 1	42	2	42	2	Frame B has a few minor issues. Firstly, the y-axis scale is non-linear (I cant tell if it is logarithmic or not) and it is impossible to tell how big the phytoplankton contribution is, as it is essentially off scale (all you can tell is that it is greater than 400). Second, the right-hand "warmer-cooler" is a bit confusing ... as I understand it, the movement is due to temperature changes and the species are moving to remain "isothermal" - i.e. they are moving into previously cooler water that has become warmer. [Keith Shine, United Kingdom]	The figure has been approved by the WGII Plenary and we prefer to not modify it now.
Topic 1	42	2	42	3	Figure 1.8 caption: 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]	Has been rephrased indeed, following the WGII approved text.
Topic 1	42	3	42	3	In the caption states "based on studies since the AR4". However, in WG 2 report, it states that the figures are based on a variety of tables - including 18.5 that uses papers as early as 2005 (page 77). Suggestion: remove the words, or add 'primarily'. [Government of Netherlands]	We prefer to not modify the WGII approved caption.
Topic 1	42	9	42	9	"data points" is unclear [Government of Sweden]	We prefer to not modify the WGII
Topic 1	42	9	42	10	{WGII 9 Figures 3-3, 4-7, 7-2, 18-3, WGII MB-2, and WG II SPM.2}: WGII chapter 18 gives different references in the corresponding figure caption. Moreover, the Reference to WGII figure 3-3 leads to "Figure 3-3: All published glacier mass balance measurements from the Himalaya" [Lena Menzel, Germany]	To avoid confusion, only the reference to the WGII SPM has been retained - all further line-of-sight will go from there.
Topic 1	42	9			What is meant by "data points"? Is it number of studies, spatital locations, or any other? Unclear to us. [Government of Netherlands]	We prefer to not modify the WGII approved caption.
Topic 1	42	10	42	10	Remove reference to Figure 3-3 and 4-7 (not shown) [Government of Netherlands]	see response to T1-717
Topic 1	42	13	42	14	The following sentence "Glaciers continue to shrink in many regions due to climate change" (SPM-WGII) could be more correct than "Glaciers continue to shrink almost worldwide due to climate change". [Government of Italy]	Statement here is accordance with WGII Plenary Approved SPM language
Topic 1	42	13	43	1	Change to "affecting runoff and water resources downstream (medium confidence)" In WG2 Chpt 18, there is no statement of confidence after the word downstream (in the ES - page 3 , Chpt 18) [Government of Netherlands]	Statement here is accordance with WGII Plenary Approved SPM language
Topic 1	42				Concerning panel B, it is unclear what is shown. Is this the km y which the distribution has moved or expanded? [Government of Netherlands]	see response to T1-58
Topic 1	42				Figure 1.8(C) It should be very clearly noted that the yield increase by green revolution has dwarfed the impacts by climate change in past. Otherwise it gives wrong impression that yield has been decreasing in past due to climate change. [Taishi SUGIYAMA, Japan]	The assessment is about the impacts of climate change, and the relative contribution by other forcings is discussed in several

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Topic 1	42				Figure 1.8. 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]	see response to T1-425
Topic 1	42				Figure 1.8 Labels and symbols are extremely small and faint . Consider enlarging them slightly [Government of Kenya]	Technical presentation will be improved for final version
Topic 1	43	1	43	3	Suggest that reference should be made to WG1,Ch4 as this deals more with detection and attribution of changes in permafrost conditions whereas WG2 focusses more on the impacts of changing permafrost conditions (and relies on WG1 for observed changes in permafrost conditions). [Government of Canada]	Since the text comes verbatim from the WGII SPM, only this reference is now retained. WGs I and II have very carefully coordinated statements about
Topic 1	43	2	43	2	WGII 3.2, 4.3, 18.3, 18.5, 24.4, 26.2, 28.2.; would it be an option to add references to 26.3 and 28.3? [Lena Menzel, Germany]	see response to T1-627
Topic 1	43	2	43	3	Missing SPM as an added reference (as has been done for other references on the page). It is an almost direct quote from the WG2 SPM [Government of Netherlands]	see response to T1-627
Topic 1	43	5	43	10	Missing reference to Figure 1.8 [Government of Netherlands]	To maintain readability, no
Topic 1	43	5	43	11	Changing in distribution and increased hazard for the pest are related to recently climate change, and so the changing in ecosystems structure, suggesting explaining for these. The Speed of Species extinction and ecosystem change under natural climate change during the past millions of years are slower than these Human-induced climate change, but natural climate change during the past millions of years have Promoted adaptive evolution of species and ecosystem succession. Current climate change has increased risk of species extinction, but there are no many examples of current species extinction due to climate change. Under current conditions, climate change may be fueling the role of species extinction, and it will not be the only direct cause. Our understand of species extinction process, and also to understand the evolution of species is not enough, understanding on the impact of climate change on the extinctions is not enough too, and there are still large uncertainties, suggesting explaining for these. [Jianguo Wu, China]	Part of this discussion is dealt with in chapters 4 and 18 of the WG2 report - the text here is a careful summary, crafted for the space limitations of the SYR.
Topic 1	43	5	43	11	Figure 1.8 (b) :This part seems related to the Figure 1.8 (b). Please indicate [Fig. 1.8 (b)] at the end of the paragraph. [Government of Republic of Korea]	see response to T1-429
Topic 1	43	7	43	7	While only a few recent species extinctions have been attributed as yet to climate: Please specify to be clear. Either differentiate between terrestrial, freshwater and marine, or between local and global. WGII ch6 states: "While there was extinction during the PETM, there is currently no evidence for climate-related extinction in the marine record.", although local extinctions may occur, and rising temperature leads to risks of species extinctions. [Lena Menzel, Germany]	While some more specifics are now proposed on related topics, we do not have space in the SYR to distinguish the marine from the terrestrial records with respect to extinctions.

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Topic 1	43	7	43	8	It is not found in the background reports where there is high confidence about species extinction being attributed to climate change (4.3 has low confidence) - but the sentence could also be read that there is high confidence that few species have become extinct due to climate change - this is not clear though. Suggestion: remove 'high confidence' [Government of Netherlands]	This text uses plenary approved WGII summary language.
Topic 1	43	7	43	8	It is not clear if this is a statement about reality (climate change has not caused many extinctions) or about the state of science (not many studies have attributed extinctions to climate change). Suggest clarifying. [Government of Canada]	It is about the reality from the perspective of a scientific assessment, just as the other 4000 pages of the AR5.
Topic 1	43	7	43	10	This sentence states that natural global change without anthropogenic influence was slower but caused a large species shifts. How does this message relates to climate change due to anthropogenic influence? Make a contrast in a sentence such as "natural global climate change caused large ecosystem shifts of species but a recent anthropogenic influence climate change caused even higher or faster changes in ecosystem shifts". [Government of Netherlands]	We believe that the current, plenary approved WGII SPM language says exactly this and prefer therefore not to change it.
Topic 1	43	9	43	9	we would replace a word "significant" with high or large, as significant is used for statistical results. [Government of Netherlands]	WGII Plenary approved SPM language
Topic 1	43	10	43	10	Missing the word 'Figure' in the reference list, should be : WG2 Figure SPM 2.B [Government of Netherlands]	We have reduced referencing to the WGII SPM only
Topic 1	43	10	43	10	WGII 4.2-4, 5.3-4, 6.1, 6.3-4.; Is the reference to 6.4, which includes human activities intended here? [Lena Menzel, Germany]	see response to T1-433
Topic 1	43	10	43	10	The reference WGII SPM.2B should be WGII Figure SPM.2B. It would be clearer and more consistent to indicate Figure in both the citation and in the text. [Haroon Khesghi, United States of America]	see response to T1-433
Topic 1	43	11	43	11	Suggest adding 29.3 as another supporting Chapter reference. [Government of United States of America]	see response to T1-433
Topic 1	43	13	43	24	Figure 1.8 (c): This paragraph seems linked to the Figure 1.8 (c). Please indicate [Fig. 1.8 (c)] at the end of the paragraph. [Government of Republic of Korea]	see response to T1-433
Topic 1	43	13	43	24	this paragraph on crops could be combined with fishery and aquaculture issues. [Lena Menzel, Germany]	It would be hard to support this as it is not mentioned in the WGII
Topic 1	43	13	43	24	Ranges of the negative and positive impacts should be provided. [Government of Switzerland]	Not possible due to space limitations.
Topic 1	43	14	43	16	Number of studies may not be a meaningful metric for assessing the net impacts of climate on crop yields, especially if the count of studies has not been adjusted for publication bias. It seems possible that more studies have come out that specifically focus on cases in which crop yields have been adversely affected by climate change, but such studies are not representative of overall net impacts. Consider deleting this sentence, since the following sentence provide more precise information about impacts in terms of region and crop type. [Government of United States of America]	This is WGII Plenary approved SPM language

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Topic 1	43	16	43	16	has been negative or positive in these regions (high confidence): is the confidence level in the correct position within the sentence? [Lena Menzel, Germany]	This is WGII Plenary approved SPM language
Topic 1	43	18	43	18	Before effects to include: All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability (high confidence). [Government of Bolivia]	This section is about observed impacts, not about potential impacts.
Topic 1	43	19	43	19	Insert a new sentence after the one ending with "crops." as follows: "In addition, some crops dominated by monoculture (such as bananas) are especially vulnerable to yield reduction due to disease migration." [Carl Southwell, United States of America]	This section is about observed impacts, not about vulnerabilities.
Topic 1	43	20	43	20	Insert "(including, but not limited to, drought, flooding, and redistribution of pests and pollinators)" after "security." [Carl Southwell, United States of America]	This is not possible due to space limitations
Topic 1	43	21	43	21	'Figure SPM.2C' should be 'Figure 1.8C' [Government of Japan]	see response to T1-195
Topic 1	43	21	43	21	Incorrect figure reference: should be Figure 1.8C [Government of Netherlands]	see response to T1-195
Topic 1	43	21	43	21	See Figure SPM.2C: is this meant to be a reference to figure 1.8C, or to WGII SPM.2C? [Lena Menzel, Germany]	see response to T1-195
Topic 1	43	21			Is reference to Figure SPM.2C from WGII? [Stewart Cohen, Canada]	corrected
Topic 1	43	23	43	23	Missing the word 'Figure' in the reference list, should be : WG2 Figure SPM 2.C [Government of Netherlands]	reference is now to SPM only
Topic 1	43	26	43	26	remove "relatively" .. It is small compared with.. [Monika Rhein, Germany]	The text is approved WGII SPM
Topic 1	43	26	43	27	Sentence in bold "At present .....not well quantified" needs ot be rewritten as it is it gives an impression that human health issues are less important. But the message is not really that as there is less evidence, less research. Suggested redraft of the sentence is "At present world wide burden of climate change on human health -ill health- is not well quantified. " [Government of India]	The text is approved WGII SPM language.
Topic 1	43	26	43	27	"the world-wide burden of human ill-health from climate change...is not well quantified". Saying that it is not well quantified and then declare that there has been an increase of heat-related mortality/decrease of cold-related mortality could result quite a contradiction. [Government of Italy]	The text is approved WGII SPM language.
Topic 1	43	26	43	28	As written, this text seems to say that decreased cold-related mortality is a burden. In itself, surely this is one positive of climate change? [Keith Shine, United Kingdom]	The text is approved WGII SPM language and does not say that decreased mortality would be a
Topic 1	43	26	43	30	It is worth mentioning the negatives effects on health due to extensions in the geographical range of vectors borne diseases, which can be particularly important in tropical regions (see fig 2.5, page 61) [Pedro Alfredo Borges Landáez, Venezuela]	The assesment of this literature has been very thorough in chapter 18 and no general finding could be made that may be reference in
Topic 1	43	29	43	30	Concerning infectious diseases please expand this with "Zoonotic diseases are central both for food and water-borne diseases as Salmonella and Campylobacter (11.5.2.) and vector-borne diseases as Borrelia, TBE and Rift Valley fever (11.5.1.)" WG (no. is missing) (11 4-6). change to 11.5.1-2, 11.8.3. and Table 11.1, ? 18.4, 25.8 [Government of Sweden]	Not possible due to space limitations.



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Topic 1	43	30	43	30	Insert a new sentence after the one ending with "confidence)." as follows: "Geographic distribution of biomes and microbiomes may also be metamorphosing due to these changes." [Carl Southwell, United States of America]	Not possible due to space limitations and not supported by underlying report
Topic 1	43	30	43	30	Missing WG2 SPM in reference list [Government of Netherlands]	Amended
Topic 1	43	30	43	30	Missing the number of Working group report in the reference list, should be '2' (currently just says WG 11.4-6). Suggestion: change to WG 2 11.4-6 [Government of Netherlands]	Amended
Topic 1	43	32	43	38	There is no confidence statement here, giving the impression of an overly confident statement. Suggestion: add in the term "some", or a confidence interval. Also includes the somewhat weak term 'can', so a reformulation might be in place. [Government of Netherlands]	It is a factual statement that cannot be attributed a confidence level
Topic 1	43	32	43	38	Not sure what the bolded part of the paragraph is trying to say. Probably this is because of the word "through" which is a bit ambiguous. "Through" is also used in line 35 (using a different meaning than the use in line 32) which adds to the confusion. [Government of New Zealand]	We find the meaning of "through" clear enough here. "through studies" has been removed since it is redundant however.
Topic 1	43	32	43	38	This paragraph and the accompanying figure 1.9 seem to be an attempt to assess to what extent impacts can be linked to human drivers on climate. But confusingly it is also limiting itself (apparently, according to the headline statement in bold) to impacts that lead to effects on people. I don't know how to interpret this paragraph or Figure 1.9. It feels like it might support a synthesis statement to the effect that some of the impacts attributed to climate change can be linked to human drivers of climate for example North American snowpack - what about range shifts of fish and microalgae or increased coral mortality ? But I'm perplexed by this paragraph. It feels like it's trying to say something important but I don't understand what. And I don't understand why it is limiting itself to the effects of ecosystems on people when this is the only paragraph that seems to be assessing the links to human drivers on climate. [Peter Stott, United Kingdom of Great Britain & Northern Ireland]	The paragraph is not at all about human drivers on climate and we do not understand why the reviewer should believe so.
Topic 1	43	32	43	38	Awkward sentence and grammatically incorrect. Suggest rephrasing as follows: "Cascading impacts of climate change can now be detected along chains of evidence from the physical climate system through to ecosystems and then people." The sentence on lines 33-34 beginning with "Examples" can be deleted. The examples are given and labelled as such in Figure 1.9. Suggest the following conclusion from Ch. 18 section 18.6.3 would make a useful final sentence to this paragraph: "In all cases, confidence in detection and attribution to observed climate change decreases for effects further down each impact chain." [Government of Canada]	Excellent comment, has been used to shorten and clarify the statement considerably.
Topic 1	43	32	44	34	Figure 1.9 last row middle box . Should it be reduced soil moisture? Because next term is drought ....Please check. [Government of India]	Figure is based on WGII SPM figure; figure doublechecked and
Topic 1	43	32			The concept of "cascades" should be introduced in a clearer manner, or deleted. [Government of Germany]	We believe that the (revised) text, and the illustration, make the case
Topic 1	43	34	43	34	Repeated reference, (WG 2 18.6.3), should be removed. [Government of Netherlands]	Amended

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Topic 1	43	35	43	35	Can not find reference for all N American snowpack - in the figure 1.9 and in the text (as well as in reference Pierce et al 2008), it is only the western N American snowpack [Government of Netherlands]	Amended
Topic 1	44	0	44	0	Difference in links between the Figure in the WG 3 18.4, and the one in the document (The line between glacier shrinkage and changes in river discharge went from dotted to solid, and the confidence went from high/high to medium/medium [Government of Netherlands]	Graphic in present file is now consistent with WGII SPM graphic
Topic 1	44	0	44	0	The image needs to be fine-tuned aesthetically: In some instances the box around the text covers the words. [Government of Netherlands]	Will be corrected in final graphics
Topic 1	44	0			Figure 1.9 : Some boxes should be enlarged (the text touches the borders) [Thomas Stocker/ WGI TSU, Switzerland]	Will be corrected in final graphics
Topic 1	44	1	44	1	Suggest putting a box around every diagram in Figure 1.9, so that the legend can be easily associated with the correct diagram. [Government of United States of America]	We do not consider this necessary
Topic 1	44	1	44	1	Given the importance of ocean acidification in the future, particularly combined with warming temperatures, OA and it impacts should be incorporated into Figure 1.9. [Government of United States of America]	The figure is not about the future but about observed impacts, and for these the assessment is not
Topic 1	44	1	44	1	Figure 1.9: It is a good effort to make this diagram more understandable with better presentation than original one (WGII Figure 18-4). [Government of Republic of Korea]	Thanks, 18-4 has been redrawn alongside
Topic 1	44	1			Figure 1.9. Suggest clarifying in the caption that the climate changes shown are not necessarily anthropogenic. [Government of Canada]	The entire treatment of observed impacts is not relating to anthropogenic climate change - it is impossible to repeat this statement in every single paragraph of the report. At some point, reviewers need to take notice of things that are being said earlier in the text. Note, however
Topic 1	44	1			Figure 1.9, Cryosphere section, 3rd box right side: Suggest that "Alterations in drainage" or "alterations in surface hydrology and surface water distribution" would be better wording than "changes in locations of thermokarst lakes" [Government of Canada]	This could be done but we prefer not to change the figure already in WGII chapter 18 beyond the utmost necessary.
Topic 1	44	7	44	7	Please change the title 1.5 by saying "Vulnerability and extreme events" instead of "Vulnerability, exposure and extreme events" [JACQUES ANDRE NDIONE, SENEGAL]	see response to T1-290
Topic 1	44	7	45	34	Ranges of the increases or decreases stated in Section 1.5 need to be provided whenever possible. The heat-events occurrence in the USA and Europe mentioned here do not support the statement 'There has been increased heat-related mortality and decreased cold-related mortality in some regions as a result of warming', as they are just single events, which do not indicate any trend of increase or decrease. [Government of Switzerland]	Reject. Evidence in WGI Table SPM.1, WGI FAQ 2.2, 2.6; 10.6 GABI? Mortality is not mentioned in WG1

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Topic 1	44	7			1.5: Why is vulnerability linked to extreme events only? If changes are more gradual but intensive, such as the drying out of a lake, there are not extreme events but vulnerability exists. I suggest to de-link and separate the two issues. [Government of Hungary]	This section has been separated in two and this comment is therefore no longer relevant.
Topic 1	44	9	44	9	Changes in many extreme weather and climate events have been observed since about 1950. To include after this, due to the influence of historical accumulation of emissions. [Government of Bolivia]	NO. Not always were attribution to emissions proved
Topic 1	44	9	44	11	I would say "increases" and "decreases" i.e. plural [Lisa Alexander, Australia]	yes, corrected
Topic 1	44	9	44	11	Mixed singular / plural. Changes would yield decreases / increases or decreases in occurrence of / increases in occurrence of and not decrease / increase [Peter Thorne, Norway]	yes, corrected
Topic 1	44	9	44	11	Please consider to switch 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]	Reject. Oceanic uptake is a long term process, not an extreme event
Topic 1	44	10	44	10	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]	This is only a heading statment. These aspects are developed later in the section .
Topic 1	44	10	44	10	The phrase "decrease in cold temperature extremes" is a simplification of language in the WGI SPM that says "the number of cold days and nights has decreased". However, the simplified phrase may be interpreted to mean that cold extremes have gotten colder. To prevent that, we suggest the text be revised to say "fewer cold extremes". [Government of Canada]	Answer as 616.
Topic 1	44	11	44	14	The fragment written in page 44 lines 11-14, is repeated in page 46 lines 11-13 and in page 7, lines 15-17. However in page 46 a "very high confidence" degree is identified while in page 7 nothing is said about the confidence degree. Having in mind that the following statement ends with a "medium confidence" degree (l.18, p.7), it could introduce some confusion. It would be better to include in the fragment of page 7, the "very high confidence degree". [Maria Carmen Llasat, Barcelona]	Accepted. Text modified
Topic 1	44	11	44	14	Missing confidence statement: page 7 of SPM WG2 (very high confidence). Suggestion: "There is very high confidence..." [Government of Netherlands]	IT is only a heading statment . The details are below in the
Topic 1	44	11		14	"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 comment for same text on p.46 lines 11-13) [Government of Hungary]	The section is about extremes, not on climate variability. Usually, human systems and ecosystems are adapted to certain range of climate variability and negative
Topic 1	44	12	44	12	Please be more specific here about what is meant by "cyclones". [Government of United States of America]	It is not necessary, It is heading statment and says such as .It is not excluded neither tropical nor

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Topic 1	44		44		Figure 1.9 The data relative to forests is completely misleading and quite possibly incorrect. The IUFRO report, mentioned several times in this reviewers comments, suggests that 'medium/low' outcomes are a potentially gross understatement with considerable potential economic consequences, to say little of a rapidly declining natural sink and all that portends. [Harold David Tattershall, United States of America]	Please see WGII Chapter 18 for an explanation of the evidence underlying this figure.
Topic 1	44		45		This section combines climate system and impacts, along with attribution statements. There is also not a comparable section under Topic 2, projections. [European Union]	Noted, however, structure of Topic1 has been provided to us; and the important role of extremes
Topic 1	44		45		This section does not make many statements regarding high-impact low-probability types of event. [European Union]	THER IS MATERILA RELATED TO THIS ASPECT IN TOIC 2
Topic 1	44				Figure 1.9, third panel: what are "high elevation islands" and where are they located? Unclear to us. [Government of Netherlands]	The phrase specifically refers to islands with high elevations, and is the phrase used in WGII Chapter 18 from which this figure is drawn. Please also see WGII Chapter 29 for further explanation, as referenced in WGII Chapter 18. <del>The phrase has been retained to</del>
Topic 1	44				Figure 1.9. A useful figure. Would be good to redraw it using greater letter fond inside the different boxes and use some colors to highlight the arrows. [Avelino G. Suarez Rodriguez, Cuba]	This figure has been revised to enhance clarity.
Topic 1	44				Figure 1.9 Lables are extremely small and faint . Consider increasing font size slightly [Government of Kenya]	This figure has been revised to enhance clarity.
Topic 1	44				Fig 1.9: the term "high elevation islands" I assume means mountaintops and not actual islands. Since this term in not intuitive, suggest adding a definition in caption. [Haroon Kheshgi, United States of America]	The phrase specifically refers to islands with high elevations, and is the phrase used in WGII Chapter 18 from which this figure is drawn. The phrase has been
Topic 1	45	1	45	2	The end of this sentence makes no sense as written. What does 'and consequently their associated risks' mean? What is their referring to? [Peter Thorne, Norway]	It refers to the dependence of risk of these impacts on these factors . See answer to comment 631
Topic 1	45	1	45	4	The language of this paragraph needs improvement ("does" in the second line is most probably incorrect, and at least "it" is missing in the last sentence). [Government of Belgium]	Regarding "does" OK see answer to comment 631
Topic 1	45	2	45	2	"Consequently does" should be "consequently so does." [Government of United States of America]	OK. Taken in account
Topic 1	45	2	45	2	Remove "does" [Lisa Alexander, Australia]	No. If supressed It changes meaning. See comment in 631
Topic 1	45	2	45	3	The term "does" may be removed from the last part of the sentence [Government of India]	See answer to comment 632
Topic 1	45	3	45	4	It would be helpful to add a sentence expanding on why a range of factors complicates quantitative assessment. The The word "it" is missing from this sentence. [Government of United States of America]	See answer to comment 635

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Topic 1	45	4	45	4	Change 'which make difficult' to "which makes it difficult". [Lisa Alexander, Australia]	OK taken in account
Topic 1	45	6	45	6	To include the followin in red: Changes in many extreme weather and climate events have been observed since about 1950, due to the influence of historical acumulation of emissions. [Government of Bolivia]	NO. Not allways were attribution to emissions proved
Topic 1	45	8	45	9	Did heat waves only increased in Europe, Asia, and Australia? How about other continents: there were no increases? Clarify it to a reader as in the sentence before you make a conclusion on a global scale. [Government of Netherlands]	approved text from WG1
Topic 1	45	10	45	11	Is it possible to state in which regions the probability of occurrence of heat waves has doubled? [European Union]	More detailed text in WG1 Ch 10
Topic 1	45	10	45	11	Could not find any evidence in the background reports for a double in the probability of occurrence of heat waves from human influence. In the text (WG1 SPM.1) it states only that it has substantially increased. Suggestion: change back to substantially increased [Government of Netherlands]	Table WG1 SPM 1
Topic 1	45	12	45	12	The table SPM.1 is listed twice in the references (remove last one) [Government of Netherlands]	OK taken in account
Topic 1	45	12	45	12	reference to Table SPM.1 is repeated. [Haroon Kheshgi, United States of America]	OK taken in account
Topic 1	45	14	45	15	There has been increased heat-related mortality and decreased cold-related mortality in some regions as a result of warming (medium confidence).: it may be necessary to emphasize that human mortality is meant, because in the introductory statement "some ecosystems" are included. [Lena Menzel, Germany]	OK taken in account
Topic 1	45	14	45	20	Although the headline here states that there can be decreased cold-related morbidity, there are no quantitative statements in the paragraph of this impact. [European Union]	This statment is based on WGII SPM A-1 , wich in turn is based on chapters 11.4-6, 18.4 and 25.8. The paragraph content reflects the
Topic 1	45	14		20	consistency with text on page 43 line 26-28 ? [Government of Hungary]	It is consistent with page 43 line
Topic 1	45	17	45	17	Change "summer 2003" to "2003 summer" [Lisa Alexander, Australia]	OK taken in account
Topic 1	45	17	45	17	Reference is slightly incorrect: rather than WG2 26.6.1.2, the text comes both from the ES in Chapter 26, and information from 26.6 (not only 26.6.1.2). Suggestion: change to just 26.6 [Government of Netherlands]	The reference as it is is more specific and correct
Topic 1	45	17	45	17	Summer 2003 is pre-AR4, and I wonder if something more recent could be included here. [Keith Shine, United Kingdom]	In the same sentence there is reference to the 2010 Russian
Topic 1	45	17	45	20	These statements are made without qualification i.e. what is the likelihood that the 2003 summer in Europe and the 2010 Russian event were the hottest in the last 500 years? [Lisa Alexander, Australia]	Thwe literature does not provide likelihood,

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Topic 1	45	17	45	20	Please add in line 16 after „... (very high confidence)“: ” and in Europe” and delete line 17-20 beginning with “In Europe ...” because a general statement is possible and stronger than a list of examples. See WGII Chapter 23.5.1 („Further studies since AR4 have confirmed the effects of heat on mortality and morbidity in European populations and particularly in older people and those with chronic disease (Corobov et al., 2012; Corobov et al., 2013; Kovats and Hajat, 2008; Åström et al., 2011).”) [Government of Germany]	The sentence quoted by the comment is not about a trend , but as the likely effect of heat on mortality, No change is needed.
Topic 1	45	18	45	20	Two specific extreme heat events are mentioned here. It would be useful to add that both have been tied to anthropogenic climate change through event attribution studies. [Government of United States of America]	Text has been revised
Topic 1	45	18	45	20	Both of the specific extreme heat events that are mentioned here have been tied to anthropogenic climate change through event attribution studies. It would be useful to mention that here if the underpinning references exist in the chapters. [Government of United States of America]	Chapter 23 does not provide attribution- GABI : how about WG1
Topic 1	45	18	45	20	why is WGII 26.6.1.2 cited here? This statement refers to an event in Europe. It was already cited in line 17, which pertains to North America. [Stewart Cohen, Canada]	OK taken in account
Topic 1	45	18	45	20	As written this sentence makes no sense. Redrafting for clarity would be advisable. [Peter Thorne, Norway]	Disagree. It is an example of what has recently occurred that was
Topic 1	45	22	45	28	If we also consider the conclusions of WGII about heavy precipitation events, the most correct would be to say that the frequency or intensity of heavy precipitation events has likely increased in some regions, not in overall, or the “number of heavy precipitation events has increased significantly in more regions than it has decreased” (see i.e. table SPM2 p.21 WGII report, or p.22 lines 43-53 WGIIAR5_SODall.pdf) [Maria Carmen Llasat, Barcelona]	It is correct as it is in WG1
Topic 1	45	23	45	24	The sentence about humidity could be moved to the end of this section, since the heading and other sentences all refer to rainfall. [European Union]	Humidity is in this paragraph indicating to changes in water
Topic 1	45	24	45	24	Replace "or" with "and". [Government of Netherlands]	Accepted. Text modified
Topic 1	45	24	45	26	This phrasing is confusing because first sentence refers to likelihood while the second reports confidence in changes in other regions. Suggest replacing 'The frequency or intensity' with 'Confidence is high that the frequency or intensity' (similar phrasing appears in WGI). [Government of Canada]	Accepted. Text modified
Topic 1	45	25	45	26	The term "at most medium" is confusing. Consider providing the range of confidence levels associated with various changes in continental precipitation. [Government of United States of America]	Accepted. Text modified
Topic 1	45	26	45	28	This sentence contains two geographical specifiers that seem contradictory: "In land regions where observational coverage is sufficient...global scale intensification..." Please clarify what region(s) are being discussed. [Government of United States of America]	Accepted. Text modified
Topic 1	45	28	45	28	Missing reference to WG1 2.5 [Government of Netherlands]	Accepted. Text modified
Topic 1	45	30	45	36	Do floods here refer to fluvial floods, as suggested by the second and third sentences? [European Union]	OK taken in account

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Topic 1	45	33	45	35	Attending the overall section 3.2.7 of WGII Report (as well as the SREX report), it would be better not underlining the sentence about "recent detection of trends in extreme precipitation...(medium confidence)". Besides this the other paragraphs do not include underlined sentences (except the first one) [Maria Carmen Llasat, Barcelona]	OK taken in account
Topic 1	45	33	45	35	Stylistic consistency - elsewhere with a handful of exceptions it is only the opening paragraph segment bolded. [Peter Thorne, Norway]	OK taken in account
Topic 1	45	33	45	35	This sentence does not make sense. Detection of a trend in extreme precipitation and discharge doesn't say anything about whether this trend is positive or negative. Only positive trends would be associated with increased flood risk. But even if the trends in some regions or at the catchment scale are positive, this may not mean that flood risk is greater at the larger regional scale. Suggest reviewing. [Government of Canada]	OK Positive trends were included.Regarding the risk at regional scale. Here regional is used as apposite to global and the statment may be true in some cases
Topic 1	45	35	45	36	Suggest deletion of sentence. Statement is vague and the magnitude of the impact is not clearly linked to climate change. [Government of Australia]	No. It gives valuable information grouded uno the underlying report
Topic 1	45	36	45	36	"WGII 3.2.3" might be "WGII 3.2.7". [Government of Japan]	OK taken in account
Topic 1	45	36	45	36	Reference to irrelevant figure(WG1 Figure 2.33) [Government of Netherlands]	OK taken in account
Topic 1	45	36	45	36	Reference should be WG2 3.2 rather than just 3.2.3 (more information from 3.2.7 than in 3.2.3) [Government of Netherlands]	OK see answer to comment 667
Topic 1	45	36	45	36	WGII 3.2.3: this is on Streamflow. Maybe reference to WGII 3.2.7 (Extreme Hydrological Events and Their Impacts) would be more appropriate? [Lena Menzel, Germany]	OK see answer to comment 667
Topic 1	45	38	45	43	suggestion: add to this alinea 'the fraction of global population experiencing water scarcity increase with the level of warming in the 21th century' (p. 15 SPM WGII) [Government of Netherlands]	rejected, future changes discussed in topic 2
Topic 1	45	42	45	42	Wrong reference, should be 2.6.2.3 rather than 2.6.2.2 [Government of Netherlands]	Accepted. Text modified
Topic 1	45	43	45	43	Incorrect Figure reference: should be Figure 2.33d (for HY-INT-links to drought) rather than 2.33b (for SD11-daily precipitation) [Government of Netherlands]	Accepted. Text modified
Topic 1	45	45	45	48	Better to put the second sentence first to give more robust information to audience. [Hui JU, China]	Accepted. Text modified
Topic 1	45	45	45	52	Please note that the WG1 provides (SPM Table 1, footnote i) the statement: "There is medium confidence that a reduction in aerosol forcing over the North Atlantic has contributed at least in part to the observed increase in tropical cyclone activity since the 1970s in this region." This is a very important statement and needs to be included in the SYR. [Government of United States of America]	Reject. For balance
Topic 1	45	47	45	48	To be consistent with the WG1 SPM, suggest changing this slightly to: "However, it is virtually certain that intense tropical cyclone activity has increased in the North Atlantic since 1970." [Government of United States of America]	Accepted. Text modified
Topic 1	45	48	45	48	Reference should be Table SPM.1, not just SPM [Government of Netherlands]	Accepted.
Topic 1	45	48	45	49	Space required between these two paragraphs [Lisa Alexander, Australia]	OK taken in account

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Topic 1	45	49	45	49	The following sentence could be unclear and need further explanation: "It is likely that extreme sea levels have increased since 1970, being mainly a result of rising mean sea level". [Government of Italy]	It came from WG1 TS
Topic 1	45	49			to add the most vulnerable regions should strengthen its monitoring system behavior in sea level to develop their powers of observation and analysis. [Government of Nicaragua]	The suggestion implies to make a recommendation, which is something beyond the IPCC
Topic 1	45	51	45	51	Missing reference to WG 1, 3.7.6 [Government of Netherlands]	Accepted.
Topic 1	45	51	45	52	Missing WG2 18.3 from the references [Government of Netherlands]	OK taken in account
Topic 1	45	54	45	57	This paragraph is unclear. Please review it carefully. [Government of United States of America]	Accepted. Text deleted
Topic 1	45	54	45	57	It is not really clear to me what this paragraph means. I think it could be simplified and "While changes in climate variables depend on the variable itself" could be removed. The final sentence doesn't make sense at all. I think you are trying to say that "it is more usual for impacts to be identified locally or regionally rather than globally"? In fact maybe this whole paragraph could be removed. [Lisa Alexander, Australia]	Accepted. Text deleted
Topic 1	45	54	45	57	This short paragraph is out of the context. It is more a general message, hence move it to the introduction of section 1.5. [Government of Netherlands]	Accepted. Text deleted
Topic 1	45	56	45	56	Revise to: "Therefore it is more frequent that..." [Government of Netherlands]	Accepted. Text deleted
Topic 1	45	56	45	56	The second sentence starting with "therefore" is not clear in what it is communicating. Consider rephrasing it for clarity [Government of Kenya]	Accepted. Text deleted
Topic 1	45	56	45	57	The last sentence should probably read: Therefore it is more frequent that they could be identified locally or regionally than at global scale. [Government of Austria]	Accepted. Text deleted
Topic 1	45	56	45	57	This sentence as written makes no sense. It is missing some words or the structure is poor or both. I cannot infer what is intended so cannot make a constructive suggestion as to how to fix this. [Peter Thorne, Norway]	Accepted. Text deleted
Topic 1	45	56	45	57	The final sentence in this paragraph does not make sense - there must be something missing..... [Government of New Zealand]	Accepted. Text deleted
Topic 1	45	56	45	57	Therefore is more frequent that they could be identified locally or regionally than at global scale: sentence may need rewording, please check [Lena Menzel, Germany]	Accepted. Text deleted
Topic 1	45	56	45	57	The wording of this sentence is incomplete/unclear. Suggest: While changes in climate variables depend on both the variable itself and on the geography, impact changes are more geographically heterogeneous as they also depend on social and economic factors. They are therefore more frequently identified at a local or regional scale rather than at a global scale. [Government of United Kingdom of Great Britain & Northern Ireland]	Accepted. Text deleted
Topic 1	45	56			Therefore is more frequent...' should be rewritten [Stewart Cohen, Canada]	Accepted. Text deleted
Topic 1	46	1	46	2	"multidimensional inequalities" is jargon. Can it be replaced with simpler everyday language please ? [David Wratt, New Zealand]	This wording has been retained as it draws directly from the WGII
Topic 1	46	2	46	3	Differential risks' - unclear what this means. Suggestion: remove sentence, change term, or elaborate on what the term means. See also SPM page 7 line 24-25 [Government of Netherlands]	This wording has been retained as it draws directly from the WGII SPM.



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Topic 1	46	3	46	5	The second part of the following sentence is not clear: "People who are socially, economically, culturally, politically, institutionally, or otherwise marginalized are especially vulnerable to climate change and also to some adaptation and mitigation responses". It could be important to clarify the reason why some categories of people are especially vulnerable to some adaptation and mitigation responses. [Government of Italy]	Space limitations do not allow further discussion here, but please refer to the underlying support for this statement in the WGII contribution as indicated in this paragraph, including WGII
Topic 1	46	8	46	8	Insert "race" after "class,". [Carl Southwell, United States of America]	The wording has been retained as it draws directly from the WGII
Topic 1	46	8	46	9	Missing SPM as an added reference (as has been done for other references on earlier pages). It is an almost direct quote from the WG2 SPM [Government of Netherlands]	Added
Topic 1	46	9			to add the obligation of countries most responsible for GHG emissions to substantially strengthen the financial mechanisms of the Convention as the Green Climate Fund, Fund adaptation and others. [Government of Nicaragua]	Comment appears to be misplaced.
Topic 1	46	11	46	11	It is not clear why cyclones are mentioned (and not in a similar statement in WG1 A.1), and why references from Africa (22), Europe (23) and Asia (24) are not referenced - yet the text clearly states "for countries at all levels of development". Suggestion: include references from the other three areas. [Government of Netherlands]	This statement refers to aspects of exposure and vulnerability revealed by the impacts of extremes, and the underlying evidence includes impacts of
Topic 1	46	17	46	19	Missing SPM as an added reference (as has been done for other references on earlier pages). It is an almost direct quote from the WG2 SPM [Government of Netherlands]	SPM is referenced
Topic 1	46	21	46	23	This bullet states that most of the increase in direct and insured losses from weather-related disasters is attributable to increasing exposure of more assets in risk areas. However, WG II 10.7.3 - which is cited as the source of this statement - says that only one study has actually analyzed global normalized insurance losses and that it evaluates too short of a time period to infer a reliable trend. The authors should modify this sentence to match the underlying assessment in the WG II report. [Government of United States of America]	This paragraph has been modified to draw directly from wording in WGII AR5 Chapter 10 and SREX.
Topic 1	46	21	46	23	We think that the initial wording is a bit fuzzy. Insured losses are direct losses but not all direct losses are insured. Maybe "the proportion of" could be placed after the first "and" [Government of Netherlands]	This paragraph has been modified to draw directly from wording in WGII AR5 Chapter 10 and SREX.
Topic 1	46	21	46	24	Suggest clarify 'direct and insured losses'. Some reference point for what constitutes a 'substantial' increase could be provided. [Government of Australia]	This paragraph has been modified to draw directly from wording in
Topic 1	46	22	46	22	References SREX 4.5.3.3 and WG2 10.7.3 listed twice in the same paragraph. Suggestion: remove the first instance on line 22 [Government of Netherlands]	Removed as requested.
Topic 1	46	22	46	23	Should this be increasing exposure and more assets in risk area, or is it correct as written? [European Union]	This paragraph has been modified to draw directly from wording in
Topic 1	46	22	46	23	In SREX SPM B it has high confidence that the major contribution to increased losses from weather-related disasters is from increasing exposure of assets, but there is no confidence comment in the SYR. Suggestion: add (high confidence) at the end. [Government of Netherlands]	Confidence language has been added.

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Topic 1	46	28		30	Can "observed positive effects" of climate-related hazards be diversification of social networks? We do not think so. Clarify this sentence such as "Observed positive effects of climate-related hazards ....., caused changes in diversification of social .....". [Government of Netherlands]	This wording has been retained as it draws directly from the WGII SPM.
Topic 1	46	38	46	40	The text does not include the confidence statement (although it is included later in the report). Suggestion: There is high confidence that adaptation experience.... (both parts of the statement are high confidence) [Government of Netherlands]	The headline has been revised, comment no longer applies.
Topic 1	46	38	46	48	"adaptation is becoming embedded in some planning processes, with more limited implementation of responses" The 'more limited implementation of responses' is unclear and deserves explanation [H-Holger Rogner, Austria]	As this is approved wording from the WGII SPM we are reluctant to change this. A more detailed explanation is not possible within
Topic 1	46	42	46	43	The text here states" Throughout history, people (...) with varying degrees of success." This is an important statement for explaining the historical human response in brief and should be maintained as written in WG2 SPM. [Government of Japan]	Accepted, retained
Topic 1	46	42	46	43	The sentence beginning with "Throughout human history..." is extremely general and obviously true, and offers little additional content or meaning to the broader report as a result. Consider removing this sentence altogether. [Government of Germany]	We consider this sentence provides important context as it signals that adaptation per se is not a completely novel issue.
Topic 1	46	42	46	46	Suggest including a sentence between "Throughout history, people and societies have adjusted to and coped with climate...with varying degrees of success." and the following sentence that explains why "now" is different than "throughout history". (A greater rate of change (climate change/impacts), infrastructure investment, population growth...). [Government of United States of America]	The text has been revised to point to the fact that now, an overall changing climate is adding pressure.
Topic 1	46	47	46	48	These two lines are repeated in the shaded box just above. Was this intended? [Government of United States of America]	The text in the shaded box has been revised to avoid the direct
Topic 1	46	47	46	48	"with more limited implementation of responses" is very vague. What are "responses"? What exactly does "more limited" mean? [Government of Netherlands]	As this is approved wording from the WGII SPM we are reluctant to change this. The meaning is that implementation is more limited
Topic 1	46	47			"...more limited" is a comparative wording - so please explain more limited than what. (Or else reword). [David Wratt, New Zealand]	As this is approved wording from the WGII SPM we are reluctant to change this. The meaning is that implementation is more limited
Topic 1	46	50	46	50	To include what is in red. There is increasing recognition of the value of social, institutional, community-based adaptation and ecosystem-base [Government of Bolivia]	Sorry we don't understand the comment - the text is included and has been retained in the revised
Topic 1	46	55			to add the projections or scenarios of changing climates for selecting adaptation measures for planning processes. [Government of Nicaragua]	This has will be dealt with extensively in topic 2 and would

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Topic 1	46	57	46	57	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]	This is included in topic 3 as it is about adaptation pathways; this section focuses on experiences (rather than what further steps could be taken for adaptation).
Topic 1	47	1	47	1	To include what is in red. Adaptation experience is accumulating across regions in the public, private and community sector. [Government of Bolivia]	This material is now contained in topic 4 since it provides a better match with an effort to describe
Topic 1	47	1	47	30	Adaptation experience is accumulating across regions in the public and private sector...: The reference to WGII SPM is only at the very end of the paragraph. For clarity, include reference to WGII SPM close to the bold statement as well [Lena Menzel, Germany]	This material is now contained in topic 4 since it provides a better match with an effort to describe policy options and their implementation. References are
Topic 1	47	6	47	6	"roughly" is ambiguous word. Maybe take this word out or change a text to "equally to". [Government of Netherlands]	Comment doesn't seem to apply as the word 'roughly' does not
Topic 1	47	9	47	11	this is not the case in the UK, let's not be fooled. The current government has stifled all resource and funded that was until recently via the Technology Strategy Board funding climate change adaptation work. This has now ceased and it is clear the current government is not funding any more of this kind of work. Funding is now being poured into fracking as the emphasis is too much on money and economic recovery and not the environment. I would not be surprised if this is not the case in other European countries [Jason Fitzsimmonz, England]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic 4 as it provides better context for the discussion of policy options.
Topic 1	47	9	47	11	Adaptation experience. Examples of adaptation practice for Europe are given. But it is quite selective, leaving out, for example, mainstreaming into various spending programmes under the 2013-20 Multiannual Financial Framework, heatwave action planning at national and local levels. Perhaps it should be made clearer that only a handful of examples are given. [European Union]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic 4 as it provides better context for
Topic 1	47	9	47	11	I added the word which marked with red:In Europe, adaptation policy has been developed across all levels of government, with some adaptation planning integrated into coastal, forest and water management, into environmental protection and land planning, and into disaster risk management. [Government of Turkey]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic 4 as it provides better context for
Topic 1	47	9	47	11	I added the word which marked with red:In Europe, adaptation policy has been developed across all levels of government, with some adaptation planning integrated into coastal, forest and water management, into environmental protection and land planning, and into disaster risk management. [Eray Özdemir, Turkey]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic 4 as it provides better context for
Topic 1	47	9	47	11	The role of the European Commission and the relevant policies and measures formulated and implemented should be mentioned here. The EU is the only political entity at the continent level that has been active in implementing mitigation and adaptation measures and policies. [Government of Switzerland]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic

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Topic 1	47	24			to add national and local governments are involved in the planning and evaluation of adaptation through national and local strategies. [Government of Nicaragua]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic
Topic 1	47	27	47	28	What is meant by the term "other development activities"? This is very vague and could use some clarification. [Government of Germany]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic
Topic 1	47	29	47	30	Suggest including Chapter 29, Section 29.6.4 as another supporting Chapter reference. [Government of United States of America]	This bullet is approved WGII SPM text and we see insufficient reason to change this; the material has been shifted to Topic
Topic 1	48	0	48	0	Error in the label of the y axis - in the original, it is normalized density (normalized so area sums up to one), changed to frequency of occurrence in the SYR. However, the numbers on the y axis have not changed, and no longer match up with the number of realizations (114, but the grey bars show less than this). Suggestion: keep the label, but change the numbers so they are actually the number of models. For the observations, just keep the red hatched lines at constant width (as the current base) [Government of Netherlands]	Taken into account. Y-label modified.
Topic 1	48	0	48	0	It appears that there is a contradiction between the opening statements and the graphs. The models look to capture 1951-2012 well, but not the two shorter periods. Furthermore, the comment about spread in models coming from natural/internal variability has been removed, making it even less clear that the models could still be doing a reasonable job for longer term trends. Suggestion remove from page 48 lines 4 to 5 the 'more rapid warming in the second half and cooling following a volcanic eruption, and add in the caption of the figure that spread in the model runs comes from internal variability. [Government of Netherlands]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title.
Topic 1	48	0			Box 1.1, Figure 1 ) °C per decade should be written between parenthesis, as in the original WGI figure ! [Thomas Stocker/ WGI TSU, Switzerland]	Accepted.
Topic 1	48	1	48	39	Suggest identifying the observation source(s) for transparency. [Government of United States of America]	Rejected. Would add too much technical detail to SYR. Line-of-cite to WGI Report ist given for
Topic 1	48	1	48	39	Suggest that the topic of Climate sensitivity [ECS] be raised and discussed much earlier in the document. [Government of United States of America]	Taken into account. Box 1.1 is now placed and called out in
Topic 1	48	1	49	12	This box would be more useful if it was more user orientated and focused on the key messages. This could be done by including an introduction to the box and including more information about the implications of often incorrectly reported, high profile topics of climate sensitivity and ""the pause/slowdown/hiatus". [Government of United Kingdom of Great Britain & Northern Ireland]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title.
Topic 1	48	1	49	12	Box 1.1 should be placed in Section 1.4 where the impact is addressed. It does not fit into Section 1.6, which is about adaptation experience. [Government of Switzerland]	Taken into account. Box 1.1 is now placed and called out in Section 1.2.

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Topic 1	48	1		39	Within the Box, references are given in many different ways: e.g. Box 1.1 or Box SYR.1, or Figure 1.1a and Figure SYR.1a. It is not clear, if these refer to the same underlying material. And where in the SYR-text is the reference to Box 1.1, in which topic should it fit? [Government of Germany]	Accepted. References now consistent.
Topic 1	48	1			Box 1.1 Recent temperature trends and their implications: We are concerned that the main messages of this Box are not coming through as clearly as possible as they are getting lost in the technical details. We recommend revising the first bolded paragraph to convey more clearly that 1. models do reproduce the general features of long term global scale temperatures changes, 2. over shorter periods, there are some inconsistencies between models and observations, 3. investigating the reasons for the inconsistencies can improve our understanding of the climate system response to different forcings and improve model development. [Government of Canada]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title.
Topic 1	48	1			Box 1.1 Recent temperature trends and their implications: Some important information from Box 9.2, on which this Box is based, is missing from this Box. We recommend including the point that there is no systematic bias in forcing in the CMIP5 models over the recent 15 years, which means that the discrepancy between models and observations cannot simply be explained by models overestimating the response to changes in forcing. This finding contributed to the assessment that the recent warming hiatus is attributable in equal measure to a changes in external forcing and to internal variability. [Government of Canada]	Rejected. Alas, that the CMIP5 models show not forcing bias is unrelated to the question of whether they overestimate the response to forcing, be it right or wrong. Hence, no such straightforward conclusion can be drawn as suggested here.
Topic 1	48	3	48	5	The statement that "there is very high confidence that climate models reproduce...." is not supported by Box 1.1, Figure 1a,b. In Figure 1a, the odel simulations significantly overestimate the warming trend over the recent 15 years, and vice versa over the previous period. [Government of South Africa]	Accepted. Callout should have been to Figure 1c; corrected now.
Topic 1	48	3	48	8	change sequence : first the most important sentence: "The observed recent decrease in the rate....external forcing". Followed by the statement "there is very high confidence that climate models.... Eruptions. [Monika Rhein, Germany]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and
Topic 1	48	6	48	8	This is not very clear. Perhaps "internal natural variability" needs better explanation. Are the reduced external forcing not included in the models? If it is, it can not be used to explain the bad correlation between measured and modelled values. Is the conclusion that 15 years is a too short time period to expect a good correlation between modelled and measured values? [Government of Sweden]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title.
Topic 1	48	6		8	"observed recent decrease in the rate of surface warming is attributable .." together with the text piece in lines 28-31 and text on p. 49 lines 4-11): this is one of the most sensitive issue for certain readers (would it be possible to provide some clearer and more consistent wording?) [Government of Hungary]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title.
Topic 1	48	7	48	8	What kind of "external forcing" should be provided. [Zong-Ci Zhao, China]	Taken into account. Sentence in question is verbatim from WGI SPM, but natural forcings are

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Topic 1	48	8	48	8	Here, the confidence is not normally formulated. "Expert judgment" should be removed, and the confidence-related statement should be reformulated according to established standards. [Government of China]	Accepted.
Topic 1	48	9	48	9	Incorrect reference: WG1 3.7 refers to sea-level rise, not surface temperature changes. [Government of Netherlands]	Accepted. Line-of-cite has been simplified.
Topic 1	48	9	48	9	Potentially misplaced reference: WG1 Box 13.2 refers to marine ice-sheet instability, not about recent temperature trends [Government of Netherlands]	Taken into account. Correct reference would have been WG1 Box 13.1, which deals with the
Topic 1	48	10	48	11	Box 1.1, Figure 1: The authors should explicitly discuss how these climate models struggle to accurately reproduce observed warming over (sub-)decadal timescales rather than longer (i.e., multi-decadal) timescales - e.g., in panels (a) and (b). Therefore, the bolded text should be revised to reflect this aspect of global climate models. [Government of United States of America]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title.
Topic 1	48	16	48	16	"(in °C per decade)" -> the "in" should be written outside of the parenthesis [Thomas Stocker/ WGI TSU, Switzerland]	Rejected. This is a caption, not a label.
Topic 1	48	18	48	18	The reference to Figure 1.1 is confusing. Did the authors intend to reference Box 1.1, Figure 1c in their comparison of modeled and observed temperatures for 1951-2012? [Government of United States of America]	Accepted and corrected.
Topic 1	48	18	48	18	Incorrect figure reference: should be 'Box 1.1, Figure 1c' not Figure 1.1a. [Government of Netherlands]	Accepted and corrected.
Topic 1	48	18	48	18	1.1c not 1.1a [Keith Shine, United Kingdom]	Accepted and corrected.
Topic 1	48	18	49	12	the hiatus is explained as being caused by external forcing - that is explained in the box - and by internal variability. I miss a para that explains the important role of the ocean for the internal variability and I strongly advise to add this information. [Monika Rhein, Germany]	Taken into account. Possible ocean contribution is now included, as in WGI SPM.
Topic 1	48	19	48	19	"Box SYR.1" should be "Box 1.1" [Government of Japan]	Accepted and corrected.
Topic 1	48	19	48	19	Incorrect reference label: should be Box SYR 1.1, Figure 1c not Box SYR 1 [Government of Netherlands]	Accepted and corrected.
Topic 1	48	23	48	23	Reference WG1 10.8 Box 12.2 should be in curly brackets ({}), and at the end of the paragraph. [Government of Netherlands]	Accepted and corrected.
Topic 1	48	23	48	23	Incorrect use of the word 'conversely'. Suggestion: replace with 'furthermore' [Government of Netherlands]	Accepted.
Topic 1	48	23	48	23	Why does this sentence begin with "conversely"? This is confusing as the sentence does not seem to be "opposite" to the preceding sentence. Suggest this sentence would be more straightforward if it just began by saying "Independent estimates....etc.". [Government of Canada]	Accepted.
Topic 1	48	23	48	26	Could not find evidence for the independent estimates of radiative forcing etc. since 1970 is consistent with the assessed likely range. Suggestion: remove 'that have been available since 1970' [Government of Netherlands]	Taken into account. Sentence rewritten to make clear that it is heat-storage estimates that have
Topic 1	48	23			Why "conversely"? Please add information about these "independent estimates": are they from observations and models? [Government of Germany]	Taken into account. "Conversely" changed. There is no space to provide extended technical

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Topic 1	48	26			The need for footnote 9 is unclear. Please check, if it is really necessary to explain the concept of ECS in the context of trends over short periods. [Government of Germany]	Noted. Footnote is kept, because the stated consistency in observed energy conservation is
Topic 1	48	28	48	31	We propose to add the following, very important information (WG1, SPM, p.5): "Due to natural variability, trends based on short records are very sensitive to the beginning and end dates and do not in general reflect long-term climate trends." [Government of Germany]	Taken into account. Paragraph containing this sentence has been added to Section 1.2 and to SPM.
Topic 1	48	29	48	30	Figure reference should be at the end of the sentence rather than the middle as the figure(s) refer to the entire sentence. [Government of Netherlands]	Accepted and corrected.
Topic 1	48	30	48	30	Suggest that the word "Nevertheless" be removed. [Government of United States of America]	Taken into account. Entire sentence removed.
Topic 1	48	31	48	31	"Figure SYR.1a" should be "Figure 1.1a" [Government of Japan]	Accepted and corrected.
Topic 1	48	31	48	31	Inconsistent figure reference: in text says Figure SYR.1a, while should be SYR SPM.1(top). [Government of Netherlands]	Accepted and corrected.
Topic 1	48	35	49	1	Page 49 line 1 refers to a forcing trend in tropospheric aerosols (as a contributor to the reduction in surface warming between 1998 and 2012), whereas the previous sentence on page 47 lines 35-37 only mentions volcanic eruptions and solar forcing. Suggest adding mention of tropospheric aerosols as a contributing factor to the reduced warming rate over 1998-2012 to lines 35-37 page 48. Also, the expressions 'downward forcing trend' and "downward phase" are unduly technical. Can these be expressed as "cooling effects" and "cooling phase"? [Government of Canada]	Taken into account. Less technical language used. Explanation of low confidence removed to avoid confusion. (Forcing from tropospheric aerosol shows no trend, but with large uncertainty. This is why it did not show up under "explanations" but under "uncertainty")
Topic 1	48	36	48	36	".increasing to a lesser rate..." should be "increasing at a lesser rate..." [Government of United States of America]	Accepted and corrected.
Topic 1	48	36			Change "....decreasing to a lesser rate...." to ".....decreasing at a lower rate....." [Government of New Zealand]	Accepted and corrected.
Topic 1	48	37	48	37	first instance of the word 'to' should be a dash (-) to be consistent with other ranges of years in the paragraph. [Government of Netherlands]	Taken into account. All dashes in text are now "to"s.
Topic 1	48	38	49	2	There is at least the appearance of some mild inconsistency here between low confidence in quantifying the role of forcing and medium confidence in the expert judgment that attributes the reduced warming roughly equally to internal variability and reduced forcing. In both cases the assessments reflect expert judgment. [Government of Canada]	Noted. The medium confidence in the relative contributions of internal variability and forcing trend results from high confidence in sizeable role of internal variability and low
Topic 1	48		48		Box 1.1 contains useful information but is not referred to in the text. [European Union]	Accepted, thank you. Callout added to Section 1.2.

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Topic 1	48		49		Box 1.1. The box is ill-placed and should be moved to the beginning of Topic 1. Better, it is deleted, or only that information is kept that has not already been discussed previously. However, the charts in the box are very interesting, and point to the need to develop a separate section on how global (and also probably regional) climate modelling is done for historic climate. There is very little information on this in the document which vastly reduces the credibility of the modeling results. It is suggested that it is briefly discussed who, where, and how try to model climate, what are strengths and weaknesses of the current level of modelling (e.g., what can be seen from the charts, or that the models may be OK for the long run, but they may be inaccurate for the short run etc.), and why climatologists are confident that there projections should be accepted. Such methodological descriptions should be included for all major fields of data for which the source of information is not exclusively the literature. References to the relevant methodological sections of the WG reports would also be needed. [Government of Hungary]	Taken into account. Callout added to Section 1.2. Details on model development and model evaluation are given in WG1 Ch09. Space and target audience forbid their inclusion in SYR.
Topic 1	48				In all three graphs is the maximum frequency 8? We think that maximum should be 14. [Government of Netherlands]	Taken into account. Relative frequency is shown. Y-label
Topic 1	48				It is stated that "There is high confidence that climate models reproduce the general features of global scale annual mean surface temperature increase". Figure 1.1 in Box 1.1, shows that models are good at reproducing long term measurements (1951-2012) but quite poor at for specific periods, overestimating 1998-2012 and underestimating 1984-1998. This is not highlighted anywhere in the text of Box 1.1. [Government of Netherlands]	Taken into account. This juxtaposition is brought out much more clearly in revision.
Topic 1	48				Box 1.1. Please consider to also include information regarding trends based on short data records in this box. From WGI SPM page 3 "Due to natural variability, trends based on short records are very sensitive to the beginning and end dates and do not in general reflect long term climate trends.". Also, regarding the observed recent decrease in the rate of surface warming you mention that this is caused from both internal natural variability and external forcings. However, in the following paragraphs you only explicitly mention cooling contributions from radiative forcings, and due not explicitly mention what internal natural variability is and how it relates to the rate of temperature. Please consider to include a paragraph containing redistribution of heat in the ocean and other possible contributors (e.g. as discussed in WGI SPM Section D.1 page 13). [Government of Norway]	Taken into account. Paragraph containing this sentence has been added to Section 1.2 and to SPM.
Topic 1	48				The bold text (lines 3-9) convey a useful message - but does it rely entirely on expert judgement? The rest of Box 1.1 is unhelpful suggest deletion. [Government of United Kingdom of Great Britain & Northern Ireland]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and
Topic 1	49	4	49	12	This paragraph could be moved to follow lines 28-31 on P48 since it discusses a similar issue. More importantly, the fact that models underestimate the warming trend for 1984-1998 is not discussed anywhere. [European Union]	Taken into account. Logical flow has been reversed, to bring out main messages more clearly and to align text better with title. Period



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Topic 1	49	6	49	6	This sentence is confusing. Does the word Variability (last word in this line) refer to "internal variability" (from in the previous sentence) or to variability in general? [Government of United States of America]	Taken into account. Sentences now joined by "which".
Topic 1	49	7	49	8	It might be confusing for some readers where the report states: "Variability sometimes enhances and sometimes counteracts the long-term externally forced warming trend". While in the next sentence (line 8) states: "Internal variability thus diminishes the relevance of short trends for long-term climate change" While experts will likely understand what is meant, these sentences could be combined and rewritten to be clear for all readers. [Government of United States of America]	Taken into account. First of the two sentences has been augmented by references to Box 1.1, Figures 1 a and b. Comparison of these should help make the point clearer.
Topic 1	49	8	49	8	Add extra sentence: "(Figure 1). Models overestimate the trend for 1998-2012 but underestimate the trend for 1984-1998 which could be caused by internal climate variability. [European Union]	Taken into account. Sentence modified to that effect.
Topic 1	49	8	49	10	It states here that the specified forcings in GCMs "may also contain contributions from inadequacies.....". The term "may" suggests that there are model parameters/processes that are somehow not known. Why would there be any uncertainty about this? Please clarify. [Government of United States of America]	Noted. "may" expresses that uncertainties are too large to state with confidence that model forcings are incorrect. Text is almost verbatim from WGI SPM.
Topic 1	49	9			It should be noted that these contributions are only relevant on short time scales and do not affect the climate trend. [Government of Germany]	Rejected. This would be an incorrect statement.
Topic 1	49	10	49	10	The wording should at least read '... from a too strong response to ...' (but it would be simple to use the exact words from WGI SPM, if the change does not have a purpose). [Government of Belgium]	Accepted. WGI SPM wording used.