

IPCC Special Report on the Ocean and Cryosphere in a Changing Climate

Chapter	From page	From line	To page	To line	Correction																													
Technical Summary	6		6		Figure TS.2: "Permafrost" changed to "permafrost thaw" for more clarity, symbol adapted accordingly (content/statement didn't change)																													
Technical Summary	6		6		Figure TS.2: "Ocean oxygen loss" changed to "Ocean oxygen content" for more clarity, symbol adapted accordingly (content/statement didn't change)																													
Technical Summary	10	29	10	29	minus sign missing: replaced "123" by "-123"																													
Technical Summary	10	36	10	36	replaced "Figure TS.5" by "Figure TS.5a and b"																													
Technical Summary	11	12	11	12	changed "and" to "or" between "snow-dominated" and "glacier-fed".																													
Technical Summary	12	3	12	5	Replaced sentence starting with "In regions dominated" by "In regions with mostly smaller glaciers (e.g., Central Europe, Caucasus, North Asia, Scandinavia, tropical Andes, Mexico, eastern Africa and Indonesia), glaciers are projected to lose more than 80% of their current ice mass by 2100 under RCP8.5 (medium confidence), and many glaciers will disappear regardless emission scenario (very high confidence)."																													
Technical Summary	12	28	12	28	replaced 'projected' by "expected to"																													
Technical Summary	12	45	12	48	Changed sentence "Current adaptation ... beyond 2°C warming (high confidence)" to "Current snowmaking technologies are projected to be less effective in a warmer climate in reducing risks to ski tourism in most parts of Europe, North America and Japan, in particular at 2°C global warming and beyond (high confidence)."																													
Technical Summary	14	0	14	18	Figure TS.5: For more clarity previous Figure TS.5 has been replaced by a re-designed version TS.2a and a supporting, rather table-like Figure TS.2b. The figure caption has been adapted to reflect the changes and improve clarity																													
Technical Summary	15	38	15	38	replaced "Figure TS.5" by "Figure TS.5a and b"																													
Technical Summary	16	2	16	8	The ES statement on Arctic sea ice required revision for consistency with underlying chapter text to say "Arctic sea ice extent continues to decline in all months of the year (high confidence); the strongest reductions in September (likely $-12.8 \pm 2.3\%$ per decade; 1979-2018) are unprecedented in at least 1000 years (medium confidence). It is virtually certain that Arctic sea ice has thinned, concurrent with a shift to younger ice: since 1979, the areal proportion of thick ice at least 5 years old has declined by approximately 90%. Approximately half the observed sea ice loss is attributable to increased atmospheric greenhouse gas concentrations (medium confidence). Changes in Arctic sea ice have potential to influence midlatitude weather on timescales of weeks to months (low to medium confidence). {3.2.1.1; Box 3.2}"																													
Technical Summary	16	37	16	39	The time period for the discharge trends to the Arctic ocean has been corrected in the ES (and chapter text). Correct period is 1976-2017, not 1976-2018 as cited previously.																													
Technical Summary	27	23	27	23	replaced "Figure TS.5" by "Figure TS.5a and b"																													
Technical Summary	35	21	35	28	Replaced with "Anthropogenic climate change may have contributed to a poleward migration of maximum tropical cyclone intensity in the western North Pacific in recent decades related to anthropogenically-forced tropical expansion (low confidence) There is emerging evidence for a number of regional changes in tropical cyclone behaviour such as an increase in annual global proportion of Category 4 or 5 tropical cyclones in recent decades, severe tropical cyclones occurring in the Arabian Sea, those making landfall in East and Southeast Asia, increasing in frequency of moderately large US storm surge events since 1923 and the decreasing frequency of severe TCs making landfall in eastern Australia since the late 1800s, but low confidence that these represent detectable anthropogenic signals. {6.3}"																													
Chapter 1	17		17		Update from AR5 assessed value to SR1.5 assessed value. Please change: "AR5 assessed that global mean surface warming from the pre-industrial (1850-1900) to the recent past (1986-2005) reference period was 0.61oC (likely range of 0.55oC to 0.67oC). SR1.5 assessed that global mean surface temperature during the present day interval (2006-2015) was 0.87oC (likely range of 0.75oC to 0.99oC) higher than the average over the 1850-1900 pre-industrial period (very high confidence; IPCC, 2018)." to instead read "SR1.5 assessed that global mean surface warming from the pre-industrial (1850-1900) to the recent past (1986-2005) reference period was 0.63oC (likely range of 0.57oC to 0.69oC), and during the present day interval (2006-2015) was 0.87oC (likely range of 0.75oC to 0.99oC) higher than the average over the 1850-1900 pre-industrial period (very high confidence; IPCC, 2018)."																													
Chapter 1	17		17		Table CB1.1: minor update to 5-95% ranges on global mean surface air temperature data (reflecting a minor update to the order in which the calculation is done, and bringing the 5-95% ranges into better agreement with AR5 reported values). Updated data presented here: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">GMSAT Scenario</th> <th colspan="2">2031-2050</th> <th colspan="2">2081-2100</th> </tr> <tr> <th>Mean</th> <th>5% 95%</th> <th>Mean</th> <th>5% 95%</th> </tr> </thead> <tbody> <tr> <td>RCP2.6</td> <td>0.9</td> <td>0.5 1.4</td> <td>1.0</td> <td>0.3 1.7</td> </tr> <tr> <td>RCP4.5</td> <td>1.1</td> <td>0.7 1.5</td> <td>1.8</td> <td>1.0 2.6</td> </tr> <tr> <td>RCP6.0</td> <td>1.0</td> <td>0.5 1.4</td> <td>2.3</td> <td>1.4 3.2</td> </tr> <tr> <td>RCP8.5</td> <td>1.4</td> <td>0.9 1.8</td> <td>3.7</td> <td>2.6 4.8</td> </tr> </tbody> </table>	GMSAT Scenario	2031-2050		2081-2100		Mean	5% 95%	Mean	5% 95%	RCP2.6	0.9	0.5 1.4	1.0	0.3 1.7	RCP4.5	1.1	0.7 1.5	1.8	1.0 2.6	RCP6.0	1.0	0.5 1.4	2.3	1.4 3.2	RCP8.5	1.4	0.9 1.8	3.7	2.6 4.8
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Chapter 2	3	21	3	21	minus sign missing: replace "123" by "-123"																													
Chapter 2	3	46	4	3	Replace entire sentence starting with "in some areas" by "Glacier retreat and snow cover changes have contributed to localized declines in agricultural yields in some high-mountain regions, including High Mountain Asia, the western USA, and the tropical Andes (medium confidence)."																													
Chapter 2	4	31	4	31	Replace "Artificial snowmaking ... in some regions (medium confidence)" with "In some places, artificial snowmaking has reduced the negative impacts on ski tourism (medium confidence)"																													
Chapter 2	4	43	4	45	Replace entire sentence starting with "In regions dominated" by "In regions with mostly smaller glaciers (e.g., Central Europe, Caucasus, North Asia, Scandinavia, tropical Andes, Mexico, eastern Africa and Indonesia), glaciers are projected to lose more than 80% of their current ice mass by 2100 under RCP8.5 (medium confidence), and many glaciers will disappear regardless emission scenario (very high confidence)."																													
Chapter 2	4	52	4	52	change "medium confidence" to "high confidence".																													
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Chapter 2	5	28	5	31	Change sentence "Current adaptation ... beyond 2°C warming (high confidence)" to "Current snowmaking technologies are projected to be less effective in a warmer climate in reducing risks to ski tourism in most parts of Europe, North America and Japan, in particular at 2°C global warming and beyond (high confidence)."
Chapter 2	8	1	8	1	footnote in figure: replace low latitude sentence by "including tropical Andes, Medico, eastern Africa and Indonesia"
Chapter 2	8	1	8	1	footnote in figure: replace Yukon line by "including parts of Yukon Territory and British Columbia, Canada"]
Chapter 2	10	1	10	7	Figure 2.2. Update the caption, to read : "Synthesis of trends in mean annual surface air temperature in mountain regions, based on 4672 observation stations (partly overlapping) aggregated in 38 datasets reported in 19 studies. Each line refers to a warming rate from one dataset, calculated over the time period indicated by the extent of the line. Colors indicate mountain region (Figure 2.1), and line thickness the number of observation stations used. Detailed references are found in Table SM2.2, which also provides additional information on trends for individual seasons and other temperature indicators (daily minimum or maximum temperature)."
Chapter 2	16	1	16	1	Figure 2.4: Wrong labeling of the regional bars on the map for 3 regions: 'i' should be 'g' (Low Latitudes) ; 'g' should be 'h' (New Zealand) and 'h' should by 'i' (Southern Andes)
Chapter 2	18	16	18	16	add 'for RCP8.5' after 80%
Chapter 2	18	46	18	46	1) Add this new reference to the reference list in brackets: "Cullen et al. (2013)"; 2) add this reference to reference list: Cullen, N. J. , Sirguey, P. , Mölg, T. , Kaser, G. , Winkler, M. , and Fitzsimmons, S. J. , 2013: A century of ice retreat on Kilimanjaro: the mapping reloaded. The Cryosphere , 7: 419–431.
Chapter 2	19	13	19	13	Change to: "The Low Latitudes region includes the glaciers in the tropical Andes, Mexico, eastern Africa and Indonesia. Region Alaska includes adjacent glaciers in the Yukon Territory and British Columbia, Canada."
Chapter 2	26	47	26	47	replace 'in most regions' by 'in all regions regardless emission scenario'
Chapter 2	28	33	28	33	remove: "(FAQ 2.1, Figure 1b-d)"
Chapter 2	28	34	28	34	remove: letters "e-g" after "Figure 1", so that it reads "Figure 1).
Chapter 2	32	9	32	9	replace 'Section 2.3.6' by 'Section 2.3.7'; also on line 39
Chapter 2	32	11	32	15	remove 'Rocky Mountains, USA (Frans et al., 2016; McNeeley. 2017) and move position of Table reference. So, sentence should read: ""There is medium evidence (medium agreement) that reduction in streamflow due to glacier retreat or reduced snow cover has led to reduced water availability for irrigation of crops and declining agricultural yields in several mountain areas (Table SM2.11), for example in the tropical Andes (Bury et al., 2011) and High Mountain Asia (e.g., Nüsser and Schmidt, 2017)."
Chapter 2	32	15	32	15	Add sentence "In the Southern Andes, increased streamflow in the Elqui River in Chile, due to glacier retreat or changing snow cover, has led to increased water availability for irrigation and increased . agricultural yields (Young et al., 2010)."
Chapter 2	33	42	33	42	replace 2010 with 2100 in "A similar transition to runoff peaks earlier in the year by 2010 "
Chapter 2	35	44	35	45	Remove sentence starting with 'In river basins'
Chapter 2	51	3	51	3	add 'for RCP8.5' after '2050'
Chapter 2	53	12	53	12	replace 2.3.6 by 2.3.5
Chapter 2	56	11	56	11	Section 2.3.6, not 2.3.5
Chapter 2	56	41	56	41	Add "for the European Alps" after "Alpine Convention"
Chapter 2 SM	2	5	2	10	Replace entire lines 5-10 by "within the depicted regions boundaries. Permafrost area is taken from Obu et al. (2019) but restricted to only include the permafrost in mountains, as defined based on a ruggedness index larger than 3.5 (Gruber, 2012, Figure 2.1). Within each high-mountain region, regional permafrost area is calculated on a grid with 30 arc-second resolution (~1 km), as the sum of fractional permafrost area multiplied by the area of each grid cell; permanent snow and ice are excluded and masked based on landcover data from the European Space Agency Climate Change Initiative (ESA CCI Land Cover).
Chapter 2 SM	39		39		under Western Canada/USA remove entire 2 rows 'Cascades and Rocky Mountains/Cascades
Chapter 2 SM	39	5	39	6	replace the sentence starting with "Confidence levels" by 'Evidence' refers to the strength of the evidence in attributing the impact to cryosphere changes using the summary terms 'limited' (L), 'medium' (M) or 'robust' (R) (Figure 1.4).
Chapter 2 SM	39	8	39	8	replace "Attribution Confidence" by "Evidence"
Chapter 2 SM	39		49		replace all instances of 'H' by 'R' in the 5th column (column that currently is 'Attribution confidence')
Chapter 2 SM	45		45		2. column, row Patagonia: change 'Floods' to 'Glacier lakes'
Chapter 2 SM	45		45		3. column, row Central Chile: change 'Peak flows' to 'Increase in maximum annual flow'
Chapter 2 SM	45		45		4. column, row Central Chile: remove 'currently' and remove ; 'affecting water security in dry months'
Chapter 2 SM	45		45		Add new entry between Patagonia and Central Chile (2. and 3 row): 1. col= Chile; 2. col=Agriculture; 3. col=Increased water availability for irrigation and agricultural yields; 4. col= Increased runoff due to more glacier melt; 5. col=M; 6. col=pos; 7. col=Young et al., 2010)
Chapter 2 SM	47		47		2. column, all rows under Himalaya that have 'Floods': replace all 4 cases of 'Floods' by 'Glacier lakes'
Chapter 3	3	36	3	36	The time period for the discharge trends to the Arctic ocean needs to be corrected in the ES and chapter text. Correct period is 1976-2017, not 1976-2018 as cited currently (Chapter 3 Page 4; Chapter 3 Page 62 Section 3.4.1.3.2).
Chapter 3	4	11	4	17	The ES statement on Arctic sea ice requires revision for consistency with underlying chapter text. Please revise to: "Arctic sea ice extent continues to decline in all months of the year (<i>high confidence</i>); the strongest reductions in September (<i>likely</i> $-12.8 \pm 2.3\%$ per decade; 1979-2018) are unprecedented in at least 1000 years (<i>medium confidence</i>). It is <i>virtually certain</i> that Arctic sea ice has thinned, concurrent with a shift to younger ice: since 1979, the areal proportion of thick ice at least 5 years old has declined by approximately 90%. Approximately half the observed sea ice loss is attributable to increased atmospheric greenhouse gas concentrations (<i>medium confidence</i>). Changes in Arctic sea ice have potential to influence midlatitude weather on timescales of weeks to months (<i>low to medium confidence</i>). {3.2.1.1; Box 3.2}"
Chapter 3	4	39	4	39	Number range should read 1460-1600
Chapter 3	6	29	6	29	Confidence level should be: very high confidence

Chapter 3	6	30	6	32	Text should read: "This is projected to release 10s to 100s of billions of tons (Gt C), up to as much as 240 Gt C, of permafrost carbon as carbon dioxide and methane to the atmosphere with the potential to accelerate climate change"
Chapter 3	11	3	11	4	Box 3.1: remove likelihood and add confidence statement: "Over the last two decades, Arctic surface air temperature has increased at more than double the global average (<i>high confidence</i>)."
Chapter 3	20	7	20	7	The following sentence to be added to improve traceability: "In particular, compiled datasets on observed trends in ocean acidification from different observational platforms can be found in Table SM5.3."
Chapter 3	20	34	20	34	The following sentence to be added to improve traceability: "Similar to other regions (Table SM5.3), observed changes in the carbonate chemistry of the Arctic are indicative of ongoing ocean acidification (<i>high confidence</i>)"
Chapter 3	20	41	20	41	„Although the increase of pH and saturation states by biological uptake of CO2" replaced by "Although the increase of pH and saturation states by biological carbon fixation that consumes DIC" to avoid confusion.
Chapter 3	25	25	25	26	Section 3.2.2.1: add confidence statement: "...but the clear link between summer sea ice extent and cumulative CO2 emissions provide a basis for when consistent ice-free conditions may be expected (<i>high confidence</i>)."
Chapter 3	33		33		Caption Figure 3.5. Please replace the entire existing caption with this text: "Figure 3.5: Schematic summary of key drivers that are causing, or are projected to cause, direct effects on Arctic marine ecosystems (see Section 3.2.1.2). Effects presented here are described in the main text (Sections 3.2.3.1, 3.2.4.1.1, 3.2.4.2, 3.2.4.3) with associated confidence levels and citations. For mixed effects, no confidence level is given (see main text for details on how multiple drivers cause interacting positive and negative effects). Projected effects are conceptual representations based on high emission scenarios (Section 3.2.1.2). The cross-sectional view of the Arctic ecosystem shows the association of key functional groups (marine mammals, birds, fish, zooplankton, phytoplankton and benthic assemblages) with Arctic marine habitats. Species depicted in the fishing net are not a comprehensive depiction of all target species."
Chapter 3	33		33		Figure 3.5. figure to be updated with the latest version that combines panel a and panel b
Chapter 3	58	22	58	22	Section 3.4.1.1.1: The trend period for Arctic June snow cover extent should be 1967 to 2018
Chapter 3	59	30	59	32	Text should read: "During the decade between 2007 and 2016, the rate of increase in permafrost temperatures was $0.39 \pm 0.15^\circ\text{C}$ for colder continuous zone permafrost monitoring sites, $0.20 \pm 0.10^\circ\text{C}$ for warmer discontinuous zone permafrost, giving a global average of $0.29 \pm 0.12^\circ\text{C}$ across all polar and mountain permafrost (Biskaborn et al., 2019)."
Chapter 3	61	33	61	33	Text should read: "In some well-studied regions, there is high confidence that area burned..."
Chapter 3	62	37	62	37	The time period for the discharge trends to the Arctic ocean needs to be corrected in the ES and chapter text. Correct period is 1976-2017, not 1976-2018 as cited currently (Chapter 3 Page 4; Chapter 3 Page 62 Section 3.4.1.3.2).
Chapter 3	63	41	63	41	Section 3.4.2.1: add mention of RCP2.6: "Under RCP2.6 and RCP4.5, Arctic snow cover duration stabilizes..."
Chapter 3	64	4	64	6	Text should read: "This was caused by wide range of model sensitivity in permafrost area to air temperature change, resulting in a large range of projected near-surface permafrost loss by 2100: 2-66% for RCP2.6 (24±9%; mean±95%CI) , 15-87% under RCP4.5 and 30-99% (69±10%; mean±95%CI) under RCP8.5.
Chapter 3 SM	16		16		Figure SM3.9, Land panel, Alaska group, Migration tetris box: change impact direction symbol to negative
Chapter 3 SM	16		16		Figure SM3.9, Land panel, Russian Arctic group, Cultural Services tetris box: change shading to low confidence
Chapter 3 SM	17		17		Table SM3.8. On line for "Antarctic - Southern Ocean - Sea Ice Extent" - remove entry "Low" for column "Attribution to climate change" and leave cell blank.
Chapter 3 SM	21		21		Table SM3.10, Land block, Alaska group, Migration line: change impact direction column content to read: "Positive (or neutral, see note in impact column)"
Chapter 4	6	20	6	20	Replace i.e. with incl.: Social barriers (incl. governance challenges)
Chapter 4	7	4	7	7	add '{4.4.6}' after the sentence
Chapter 4	8	7	8	7	Delete coasts, - first word on line 7: <coasts,> cities, and
Chapter 4	8	23	8	23	Insert analysis: decision analysis methods
Chapter 4	10	21	10	23	"The arrow indicated by S18 shows the result of an extensive sensitivity experiment with a numerical model for the Antarctic ice sheet (Schlegel et al 2018) combined, like the results from B19 and "prob.", with results from Church et al. (2013) for the other components of sea level rise." That is, S19 becomes S18 and the last sentence is dropped.
Chapter 4	11		11		Text in red = modifications to be made: In Figure 4.3, on the left hand side (bottom part), change "1985-2005" for " 1986-2005 ".
Chapter 4	11		11		Text in red = modifications to be made: In caption of fig 4.3, change word: « Only Arctic communities remote from regions of rapid glacial-isostatic adjustment have been selected for this assessment »
Chapter 4	13	23	13	23	Remove a: approaches have considerable potential
Chapter 4	15	12	15	13	Change to: "In general, increasing temperatures lead to a lower density of ocean water ("thermal expansion") and therefore a larger volume per unit of mass. "
Chapter 4	15	25	15	27	Add "...(RCP 8.5) since 2006 ..."
Chapter 4	15	55	15	55	currently being experienced
Chapter 4	17	5	17	11	Change to: "These intervals include the Mid-Pliocene Warm Period (MPWP) around 3.3–3.0 Myrs ago, when atmospheric CO2 concentrations were similar to today (~300-450 ppmv; Badger et al., 2013; Martínez-Botí et al., 2015; Stap et al., 2016) and global mean temperature was 2oC–4oC warmer than preindustrial (Dutton et al., 2015a; Haywood et al., 2016). The Last Interglacial (LIG) around 129–116 kyr ago, when global mean temperature was 0.5 oC–1.0oC warmer (Capron et al., 2014; Dutton et al., 2015a; Fischer et al., 2018) and sea surface temperatures were similar to today (Hoffman et al., 2017) also serves this purpose ."
Chapter 4	17	46	17	46	Symbol missing. 7.5 +/- 1.1 m
Chapter 4	32	3	32	3	"Geodynamic models are used to calculate relative sea level changes due to mass changes in the past and future."
Chapter 4	40	31	40	33	change Bamber et al., 2009 and Bamber et al., 2018 to Bamber et al., 2019.
Chapter 4	48	15	48	15	Change "to a 1 100-year-1" flood to "1-in-100-yr ESL"
Chapter 4	48	23	48	23	Change "a period" to "an average period"
Chapter 4	49	9	49	10	Change "the 1 10-year-1 or 1 10 500-year-1" to "the 1-in-10-year or 1-in-500-year"

Chapter 4	65	1	65	1	Rename header: 4.3.2.1 Point of departure																																																							
Chapter 4	65	2	65	2	Add new sub-header: 4.3.2.1.1 Environmental Dimension of Exposure and Vulnerability																																																							
Chapter 4	65	12	65	12	Replace <i>high evidence</i> with <i>high confidence</i>																																																							
Chapter 4	66	40	66	40	Re-number sub-header: 4.3.2.1.2																																																							
Chapter 4	83	17	83	17	Delete 'On the other hand': ... main harbours). They illustrate ...																																																							
Chapter 4	91	50	91	40	Replace heading with "Economic efficiency of hard and sediment-based protection"																																																							
Chapter 4	93		94		Table 4.8: 1 st column, 2 nd row: add "(Marshes/Mangroves)"																																																							
Chapter 4	93		94		Table 4.8: 1 st column, 3 rd row: remove (Maritime forest)																																																							
Chapter 4	107	19	107	19	Replace 'probable' with 'achievable': objectives are more achievable if																																																							
Chapter 4	112	13	112	13	Replace 'best' with 'most': which methods are most																																																							
Chapter 4	114	1	114	1	Replace 'case' with 'context': effective in another context																																																							
Chapter 4	114				Table 4.9: 3rd column, 2nd row: 1st bullet: Correct reference: Tuts et al., 2015																																																							
Chapter 4	114				Table 4.9: 2nd column; 3rd row: Correct reference: Tuts et al., 2015																																																							
Chapter 4	114				Table 4.9: 3rd column; 3rd row: Bold first sentence: at risk from SLR is underway in many locations.																																																							
Chapter 4	114				Table 4.9: 3rd column; 3rd row: Correct reference: Tuts et al., 2015																																																							
Chapter 4	115				Table 4.9: 2nd column, 2nd row: Correct reference: Tuts et al., 2015																																																							
Chapter 4 SM	13		13		Text in red = modifications to be made: In Figure SM4.4, on the left hand side (bottom part), change "1985-2005" for " 1986-2005 ".																																																							
Chapter 5	3	34	3	34	"from 1970 to 2017" should be "between (1971-1990) and (1998-2017)", or "from the 1971-1990 average to the 1998-2017 average" . The original source in the chapter 5 text for these numbers is p. 5-24, lines 6-7.																																																							
Chapter 5	5	27	5	27	Change "1970" to "1969" consistent with Table 5.1 and in response to governments																																																							
Chapter 5	5	28			0.04-1.46 Gt Cyr-1 -- change "high confidence" to "medium confidence																																																							
Chapter 5	5	37	5	37	Add ... ocean acidification "in the California Current" and...																																																							
Chapter 5	5	38	5	38	Change to... "and deoxygenation in the California Current and Humboldt Current EBUS are observed in the last few decades (high confidence)"																																																							
Chapter 5	7	22	7	22	Add "(medium confidence)" after "by 2100".																																																							
Chapter 5	14	37	14	39	There should not be any references to Flato et al. (2013) in this paragraph, let alone a list of 9. Please delete all of them.																																																							
Chapter 5	17	4	17	4	"(1997-2016)" should be "(1998-2017)". These correct dates are already reflected in the sub-panel (a) title.																																																							
Chapter 5	7	41	7	41	P7, line41. "...projected to decrease by..." should be followed by "3.4% to 6.4% (RCP2.6) and 20.5% to 24.1% (RCP8.5)"																																																							
Chapter 5	29		29		It is virtually certain that ocean pH is declining, and the very likely range of this decline is 0.017 to																																																							
Chapter 5	30	25			25 0.042 (RCP2.6) or 0.287-0.291 (RCP8.5) pH units by 2081-2100, relative to 2006-2105. should be: 25 0.042 (RCP2.6) or 0.287-0.291 (RCP8.5) pH units by 2081-2100, relative to 2006-2015.																																																							
Chapter 5	39	11			11 productivity is very likely to decline by 4-11% by 2081-2100, relative to 1850-1900, should be: 11 productivity is very likely to decline by 4-11% by 2081-2100, relative to 2006-2015,																																																							
Chapter 5	43	3	43	3	Add "(very likely)" before "Figure 5.13)																																																							
Chapter 5	50	13	50	13	Change from: "region, and semi-enclosed seas such as the Red Sea and Arabian Gulf" to "region, and semi-enclosed seas such as the Red Sea "																																																							
Chapter 5	54	7	54	7	Column 2 has some brackets, and plus, minus signs to be added or replaced and Column 3 has incorrect Ph values to be replaced as indicated: <table border="1"> <thead> <tr> <th></th> <th>Temperature (°C)</th> <th>pH</th> <th>DO (µMol kg⁻¹)</th> <th>POC flux (mmolC m⁻² d⁻¹)</th> </tr> </thead> <tbody> <tr> <td></td> <td>RCP 2.6</td> <td>RCP 2.6</td> <td>RCP 2.6</td> <td>RCP 2.6</td> </tr> <tr> <td>Continental slopes</td> <td>+0.30 (-0.44, +2.30)</td> <td>-0.06 (-0.19, -0.02)</td> <td>-3.1 (-49.3, +61.7)</td> <td>-0.39 (-16.0, +3.9)</td> </tr> <tr> <td>Canyons</td> <td>+0.31 (-0.27, +1.76)</td> <td>-0.05 (-0.13, +0.01)</td> <td>-3.5 (-44.7, +29.3)</td> <td>-0.33 (-10.53, +3.53)</td> </tr> <tr> <td>Seamounts</td> <td>+0.13 (+0.01, +0.67)</td> <td>-0.02 (-0.11, +0.005)</td> <td>-3.5 (-18.9, +4.1)</td> <td>-0.15 (-2.20, +1.33)</td> </tr> <tr> <td>Cold water corals</td> <td>+4.3 (-0.29, +1.85)</td> <td>-0.07 (-0.13, 0.0)</td> <td>-3.5 (-25.6, +24.7)</td> <td>-0.7 (-10.5, +3.4)</td> </tr> <tr> <td></td> <td>RCP 8.5</td> <td>RCP 8.5</td> <td>RCP 8.5</td> <td>RCP 8.5</td> </tr> <tr> <td>Continental slopes</td> <td>+0.75 (-8.4, +4.4)</td> <td>-0.14 (-0.44, -0.02)</td> <td>-10.2 (-67.8, +53.8)</td> <td>-0.66 (-33.33, +10.3)</td> </tr> <tr> <td>Canyons</td> <td>+0.19 (-0.03, +1.14)</td> <td>-0.11 (-0.35, +0.02)</td> <td>-0.8 (-28.8, +10.1)</td> <td>-0.80 (-28.76, +10.07)</td> </tr> <tr> <td>Seamounts</td> <td>+0.66 (-0.75, +3.19)</td> <td>-0.30 (-0.19, +0.001)</td> <td>-0.5 (-7.2, +3.0)</td> <td>-0.50 (-7.18, +2.98)</td> </tr> <tr> <td>Cold water corals</td> <td>+0.96 (-0.42, +3.84)</td> <td>-0.15 (-0.39, +0.001)</td> <td>-10.6 (-59.2, +11.1)</td> <td>-1.69 (-20.1, +4.6)</td> </tr> </tbody> </table>		Temperature (°C)	pH	DO (µMol kg ⁻¹)	POC flux (mmolC m ⁻² d ⁻¹)		RCP 2.6	RCP 2.6	RCP 2.6	RCP 2.6	Continental slopes	+0.30 (-0.44, +2.30)	-0.06 (-0.19, -0.02)	-3.1 (-49.3, +61.7)	-0.39 (-16.0, +3.9)	Canyons	+0.31 (-0.27, +1.76)	-0.05 (-0.13, +0.01)	-3.5 (-44.7, +29.3)	-0.33 (-10.53, +3.53)	Seamounts	+0.13 (+0.01, +0.67)	-0.02 (-0.11, +0.005)	-3.5 (-18.9, +4.1)	-0.15 (-2.20, +1.33)	Cold water corals	+4.3 (-0.29, +1.85)	-0.07 (-0.13, 0.0)	-3.5 (-25.6, +24.7)	-0.7 (-10.5, +3.4)		RCP 8.5	RCP 8.5	RCP 8.5	RCP 8.5	Continental slopes	+0.75 (-8.4, +4.4)	-0.14 (-0.44, -0.02)	-10.2 (-67.8, +53.8)	-0.66 (-33.33, +10.3)	Canyons	+0.19 (-0.03, +1.14)	-0.11 (-0.35, +0.02)	-0.8 (-28.8, +10.1)	-0.80 (-28.76, +10.07)	Seamounts	+0.66 (-0.75, +3.19)	-0.30 (-0.19, +0.001)	-0.5 (-7.2, +3.0)	-0.50 (-7.18, +2.98)	Cold water corals	+0.96 (-0.42, +3.84)	-0.15 (-0.39, +0.001)	-10.6 (-59.2, +11.1)	-1.69 (-20.1, +4.6)
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Chapter 5	55	53	55	53	Add "(medium confidence)" after "POC flux".																																																							
Chapter 5	59	20	59	20	Add "and tidal flats (Murray et al. 2019)" after "Similarly, estuarine wetlands (Section5.3.2)". Add the reference: Murray, N. J., Phinn, S. R., DeWitt, M., Ferrari, R., Johnston, R., Lyons, M. B., ... & Fuller, R. A. (2019). The global distribution and trajectory of tidal flats. <i>Nature</i> , 565(7738), 222.																																																							
Chapter 5	73	56	73	56	Change "FAO, 2018a" to Barange et al. (2018) [then add to reference list "Barange, M., Bahri, T., Beveridge, M.C.M., Cochrane, K.L., Funge-Smith, S. & Poulain, F., eds. 2018. Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options. FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp."]																																																							
Chapter 5	109	6	109	6	Change "FAO, 2018b" to Barange et al. (2018) [then add to reference list "Barange, M., Bahri, T., Beveridge, M.C.M., Cochrane, K.L., Funge-Smith, S. & Poulain, F., eds. 2018. Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options. FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp."]																																																							
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Chapter 5	123		123		3rd row 3 column, line 2: Change "FAO, 2018a" to Barange et al. (2018) [then add to reference list "Barange, M., Bahri, T., Beveridge, M.C.M., Cochrane, K.L., Funge-Smith, S. & Poulain, F., eds. 2018. Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options. FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp."]
Chapter 5 SM	93	34	93	34	replace "1000m" with "1200m"
Chapter 5 SM	93	36	93	36	Table SM5.10a, row 2(EBUS) , Attribution column replace "NA" with "Low"
Chapter 5 SM	93	36	93	36	Table SM5.10a, row 3(EBUS) , Direction of changes column, replace "Neutral" with "Increase and Decrease"
Chapter 5 SM	93	36	93	36	Table SM5.10a, row 3(EBUS) , Attribution column, replace "NA" with "Low"
Chapter 5 SM	93	36	93	36	Table SM55.10a, row6(Tropical Pacific), Direction of changes column, replace "Neutral" with "Increase and Decrease"
Chapter 5 SM	93	36	93	36	Table SM5.10a, row 6(Tropical Pacific) , Attribution column, replace "NA" with "Low"
Chapter 5 SM	93	36	93	36	Table SM5.10a, row9(Tropical Pacific), Reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row4(North Pacific), reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row12(North Atlantic), reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row16(Tropical Indian Ocean), reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row18(Temperate Indian Ocean), direction of change column, replace "Neutral" with "Increase and Decrease"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row18(Temperate Indian Ocean), attribution column, replace "NA" with "Low"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row20(Temperate Indian Ocean), Reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row22(South Pacific), direction of change column, replace "Neutral" with "Increase and Decrease"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row22(South Pacific), attribution column, replace "NA" with "Low"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row24(South Pacific Ocean), Reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 5 SM	94	0	94	0	Table SM5.10a, row28(South Atlantic) , Reference column, replace "4.2.2.6" with "4.2.2.4"
Chapter 6	3	19	3	26	Replace with "Anthropogenic climate change may have contributed to a poleward migration of maximum tropical cyclone intensity in the western North Pacific in recent decades related to anthropogenically-forced tropical expansion (low confidence) There is emerging evidence for a number of regional changes in tropical cyclone behaviour such as an increase in annual global proportion of Category 4 or 5 tropical cyclones in recent decades, severe tropical cyclones occurring in the Arabian Sea, those making landfall in East and Southeast Asia, increasing in frequency of moderately large US storm surge events since 1923 and the decreasing frequency of severe TCs making landfall in eastern Australia since the late 1800s, but low confidence that these represent detectable anthropogenic signals. {6.3}"
Chapter 6	17		17		Table 6.2 on page 6-17 second last entry: should read '2016' and 'Yellow Sea / East China Sea'. Remove reference to ,Korea Meteorological Administration (2016) here.
Chapter 6	18				Table 6.2: Column 2, row 3: change "Persian/Arabian Gulf" to "Persian Gulf"
Chapter 6	28		28		Figure 6.3a: should read 'Yellow Sea / East China Sea 2016'
Chapter 6	32	52	32	52	Should read 'Yellow Sea / East China Sea 2016'
Chapter 6	32	53	32	54	Change 'Korean Meteorological Administration 2016' to 'Kim and Han (2017)'
CCB-Low Lying Islands and Coasts	5	27	5	27	"The extreme events occurring today, such as storms, tropical cyclones, droughts, floods and marine heat waves amplified by climate change (Herring et al., 2017)..."
CCB-Low Lying Islands and Coasts	5	28	5	28	Text in red = modifications to be made: "...(Section 6.8.5, Box 4.2, Box 6.1). The exposure and vulnerability of small island developing states is highlighted by the World Risk Index with 15 small island countries ranked among the top 20 countries in the 2018 World Risk Index Report. Puerto Rico is ranked 1st and Dominica 10th in 1998-2017 Global Climate Risk report. Societal dimensions... " Sources: - World Risk Index Report 2018: https://weltrisikobericht.de/wp-content/uploads/2019/03/190318_WRR_2018_EN_RZonline_1.pdf - Global Climate Risk report: https://germanwatch.org/sites/germanwatch.org/files/Global%20Climate%20Risk%20Index%202019_2.pdf
CCB-Low Lying Islands and Coasts	5	28	5	28	Text in red = modifications to be made: "...Societal dimensions including isolation and limited resources can combine with climate changes..."
CCB-Low Lying Islands and Coasts	5	30	5	30	Text in red = modifications to be made : Add "(Moser and Hart, 2015; Noy and Edmonds, 2016; Shultz et al 2016)". Source to be added: - Shultz James M., Cohen Madeline A., Hermosilla Sabrina, Espinel Zelde, McLean Andrew (2016) Disaster risk reduction and sustainable development for small island developing states, Disaster Health, 3:1, 32-44, DOI: 10.1080/21665044.2016.1173443
CCB-Low Lying Islands and Coasts	5	33	5	33	Text in red = modifications to be made : Add "(Government of Vanuatu, 2015; Handmer and Iveson, 2017; Magee et al. 2016)" Sources to be added: - Magee, A. D., Verdon-Kidd, D. C., Kiem, A. S., and Royle, S. A.: Tropical cyclone perceptions, impacts and adaptation in the Southwest Pacific: an urban perspective from Fiji, Vanuatu and Tonga, Nat. Hazards Earth Syst. Sci., 16, 1091-1105, https://doi.org/10.5194/nhess-16-1091-2016 , 2016. https://doi.org/10.5194/nhess-16-1091-2016
CCB-Low Lying Islands and Coasts	5	35	5	35	Text in red = modifications to be made: Add "(Government of Fiji, 2016; Cox et al., 2018; Terry et al. 2017)". Sources to be added: - Terry, J.P. A.Y. Annie Lau, Magnitudes of nearshore waves generated by tropical cyclone Winston, the strongest landfalling cyclone in South Pacific records. Unprecedented or unremarkable? Sedimentary Geology 364: 276-285. https://doi.org/10.1016/j.sedgeo.2017.10.009 .

CCB-Low Lying Islands and Coasts	5	38	5	38	Text in red = modifications to be made : "...5 billion USD (UNDP, 2017). Independent estimates exceeded a cumulative impact of 4600 deaths in Puerto Rico following Hurricane Maria (Nishant et al. 2018). Total ... Sources to be added: - Nishant M.P.H., Kishore, Domingo Marqués, Ph.D., Ayesha Mahmud, Ph.D., Mathew V. Kiang, M.P.H., Irmay Rodriguez, B.A., Arlan Fuller, J.D., M.A., Peggy Ebner, B.A., Cecilia Sorensen, M.D., Fabio Racy, M.D., Jay Lemery, M.D., Leslie Maas, M.H.S., Jennifer Leaning, M.D., S.M.H., Rafael A. Irizarry, Ph.D., Satchit Balsari, M.D., M.P.H., and Caroline O. Buckee, D.Phil. Mortality in Puerto Rico after Hurricane Maria N Engl J Med 2018;379:162-70.DOI: 10.1056/NEJMsa1803972
CCB-Low Lying Islands and Coasts	5	39	5	39	Text in red = modifications to be made : "... Total damages in Dominica amounting to..."
CCB-Low Lying Islands and Coasts	5	40	5	40	Text in red = modifications to be made: Add "(The Government of the Commonwealth of Dominica, 2017; Martinez Sanchez et al. 2019)". - Martinez Sanchez, 2018. Impacts from Hurricanes Irma and Maria. & T. S. Stephenson, M. A. Taylor, A. R. Trotman, C. J. Van Meerbeek, V. Marcellin, K. Kerr, J. D. Campbell, J. M. Spence, G. Tamar, M. Hernández Sosa, and K. Stephenson. 2018. Chapter 7. Regional Climate, Caribbean [in "State of the Climate in 2017"]. Bull. Amer. Meteor. Soc., 99 (8), S150–S152, doi:10.1175/2018BAMSStateoftheClimate.1.
CCB-Low Lying Islands and Coasts	5	42	5	42	Text in red = modifications to be made: Add "(Government of Tonga, 2018; Pearce et al. 2019)" - Pearce, P.R, AM Lorrey, and H.J. Diamond. 2019 Tropical Cyclone Impacts Southwest Pacific Basin in "State of the Climate in 2018". Bull. Amer. Meteor. Soc., 100 (9), S132–S133, doi:10.1175/2019BAMSStateoftheClimate.
CCB-Low Lying Islands and Coasts	8	12	8	14	Remove the sentence : "Globally, it is estimated that sea level rise associated with a 2°C warmer world could submerge the homeland of 280 million people by the end of this century (Strauss et al., 2015)."
CCB-Low Lying Islands and Coasts	19	21	19	23	Remove the reference: "Strauss, B. H., S. Kulp and A. Levermann, 2015: Mapping Choices: Carbon, Climate, and Rising Seas, Our Global Legacy. Climate Central Research Report. Climate Central, Princeton [Available at: http://sealevel.climatecentral.org/uploads/research/Global-Mapping-Choices-Report.pdf]."
Annex I: Glossary	2				change definition of "Abrupt climate change: A large-scale change in the climate system that takes place over a few decades or less, persists (or is anticipated to persist) for at least a few decades, and causes substantial disruptions in human and natural systems." to the AR5 SYR definition: "Abrupt change/abrupt climate change: Abrupt change refers to a change that is substantially faster than the rate of change in the recent history of the affected components of a system. Abrupt climate change refers to a large-scale change in the climate system that takes place over a few decades or less, persists (or is anticipated to persist) for at least a few decades and causes substantial disruptions in human and natural systems."
Annex I: Glossary	19				Definition "Marine heatwave": change "extreme warm temperature" to "extremely high temperature"
Annex I: Glossary	25				Change entry for the definition of "Net primary production" from "The amount of carbon fixed by photosynthesis minus the amount lost by respiration over a specified time period." to read: "The amount of carbon accumulated through photosynthesis minus the amount lost by respiration over a specified time period that would prevail in the absence of land use."
Annex I: Glossary	27				Entry "Sea level equivalent (SLE)": correct "surface area of 3.625 × 1000 m ² " to read "surface area of 3.625 × 10 ¹⁴ m ² "
Annex I: Glossary	32				Add the following references in the list of references: HLPE, 2017: Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. Retrieved from: http://www.fao.org/3/a-i7846e.pdf . IPCC, 2000: Land Use, Land–Use Change, and Forestry: A Special Report of the IPCC. [Watson, R.T., I.R. Noble, B. Bolin, N.H. Ravindranath, D.J. Verardo, and D.J. Dokken (eds.)]. Cambridge University Press, Cambridge, UK, 375 pp. IPCC, 2011: Workshop Report of the Intergovernmental Panel on Climate Change Workshop on Impacts of Ocean Acidification on Marine Biology and Ecosystems. [Field, C.B., V. Barros, T.F. Stocker, D. Qin, K.J. Mach, G.–K. Plattner, M.D. Mastrandrea, M. Tignor, and K.L. Ebi (eds.)]. IPCC Working Group II Technical Support Unit, Carnegie Institution, Stanford, California, United States of America, 164 pp. IPCC, 2014: Annex II: Glossary [Mach, K.J., S. Planton and C. von Stechow (eds.)]. In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, pp. 117-130. Moss, R.H. et al., 2008: Towards New Scenarios for Analysis of Emissions, Climate Change, Impacts, and Response Strategies. Technical Summary. Intergovernmental Panel on Climate Change (IPCC), Geneva, Switzerland, 25 pp. Moss, R.H. et al., 2010: The next generation of scenarios for climate change research and assessment. Nature, 463(7282), 747–756, doi:10.1038/nature08823. Park, S. E., N.A. Marshall, E. Jakku, A.M Dowd, S.M. Howden, E.K. Mendham and A. Fleming, 2012: Informing adaptation responses to climate change through theories of transformation. Global Environmental Change, 22(1), 115–126. doi:10.1016/j.gloenvcha.2011.10.003 IUN. 1992: Article 2: Use of Terms. In: Convention on Biological Diversity. United Nations (IUN) pp. 3–4