List of Substantive Edits to the IPCC WGI AR5 Final Draft

Disclaimer

This list is intended to cover all the substantive edits* made to the report prior to publication and includes corrections of errors identified after the submission of the Final Draft (version 7 June 2013) and edits made to ensure consistency between individual Chapters/Technical Summary/Annexes as well as full consistency of the Summary for Policymakers and the underlying report. However, the list might not be fully comprehensive and copy edits are generally not part of this list.

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* This document also includes the changes listed in IPCC-XXXVI/Doc. 4.

Technical Summary

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TS	1	45			TOC to be updated, TFE.2 missing and needs to be included between TS.2.6 and TS.2.7
TS	1				Added Technical Summary Supplementary Material providing further detail regarding all 10 SPM figures with the supporting Technical Summary Figures
TS	1				Section refererences throughout the Technical Summary to the underlying Chapters have been copy edited, updated for consistency, and in some instances corrected for errors identified
TS	1				Technical Summary figures have been copy edited, updated for consistency with the underlying report, and in some instances corrected for errors identified.
TS	5	24			add line of cite " {2, 3, 4, 5, 6, 13}" after "."
TS	5	31			Replace: "It is certain that Global Mean Surface Temperature (GMST) has increased since the late 19th century (Figure TS.1). Each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade of the 2000's has been the warmest. The global combined land and ocean temperature data show an increase of about 0.89°C [0.69–1.08] over the period 1901–2012 and about 0.72°C [0.49-0.89] over the period 1951–2012 when described by a linear trend . The warming from 1850–1900 (early industrial) to 1986–2005 (reference period for the modelling chapters and the Atlas in Annex 1) is 0.61°C [0.55 to 0.67], when calculated using HadCRUT4 and its uncertainty estimates. It is also virtually certain that maximum and minimum temperatures over land have increased on a global scale since 1950. {2.4.1, 2.4.3, Supplementary Material 2.SM.3}" with "It is certain that global mean surface temperature (GMST) has increased since the late 19th century (Figures TS.1 and TS.2). Each of the past three decades has been successively warmer at the Earth's surface than any the previous decades in the instrumental record, and the decade of the 2000's has been the warmest. The globally averaged combined land and ocean temperature data as calculated by a linear trend [Footnote 5], show a warming of 0.85 [0.65 to 1.06] °C [Footnote 6], over the period 1880–2012, when multiple independently produced datasets exist, about 0.89 [0.69 to 1.08] °C over the period 1901–2012, and about 0.72 [0.49 to 0.89] °C over the period 1951–2012 when based on three independently-produced data sets. The total increase between the average of the 1850–1900 period and the 2003–2012 period is 0.78 [0.72 to 0.85] °C, based on the Hadley Centre/Climatic Research Unit gridded surface temperature data set 4 (HadCRUT4), the global mean surface temperature dataset with the longest record of the three independently-produced data sets. The warming from 1850–1900 to 1986–2005 (reference period for the modelling chapters and the Atlas in Annex I) is 0.61 [0.55 to 0.67] °C, when calculated using HadCRUT4 and its uncertainty estimates. It is also virtually certain that maximum and minimum temperatures over land have increased on a global scale since 1950. [Footnote 7] {2.4.1, 2.4.3; Chapter 2 Supplementary Material Section 2.SM.3}" [Footnote 5] The warming is reported as an unweighted average based on linear trend estimates calculated from Hadley Centre/Climatic Research Unit gridded surface temperature data set 4 (HadCRUT4), Merged Land–Ocean Surface Temperature Analysis (MLOST) and Goddard Institute for Space Studies Surface Temperature Analysis (GISTEMP) data sets (see Figure TS.2; Section 2.4.3). [Footnote 6] In the WGI contribution to the AR5, uncertainty is quantified using 90% uncertainty intervals unless otherwise stated. The 90% uncertainty interval, reported in square brackets, is expected to have a 90% likelihood of covering the value that is being estimated. The upper endpoint of the uncertainty interval has a 95% likelihood of exceeding the value that is being estimated and the lower endpoint has a 95% likelihood of being less than that value. A best estimate of that value is also given where available. Uncertainty intervals are not necessarily symmetric about the corresponding best estimate. [Footnote 7]Both methods presented in this paragraph to calculate temperature change were also used in AR4. The first calculates the difference using a best fit linear trend of all points between two years, e.g., 1880 and 2012. The second calculates the difference between averages for the two periods, e.g., 1850 to 1900 and 2003 to 2012. Therefore, the resulting values and their 90% uncertainty intervals are not directly comparable.
TS	5	42			Replace the phrase, "Although the trend uncertainty is large for short records, the" with "The"
TS	5	44			After reference to footnote 6 insert text: "Trends for short periods are uncertain and very sensitive to the start and end years. For example, trends for 15-year periods starting in 1995, 1996, and 1997 are 0.13 [0.02 to 0.24], 0.14 [0.03 to 0.24] and 0.07 [-0.02 to 0.18], respectively."
TS	5				Footnote 6: Dataset footnote to include spelled-out names
TS	6	29			replace "intervals" by "periods"
TS	6	31			replace "these intervals were not as synchronous across seasons and regions as the" by " "these regional warm periods were not as synchronous across regions as the"
TS	6	52			Change "mitigated" to "reduced" and "reducing" to "diminishing" (trickle-back from SPM correction). The complete sentence should now read: "Instrumental biases in historical upper ocean temperature measurements have been identified and reduced since AR4, diminishing artificial decadal variation in temperature and upper ocean heat content, most prominent during the 1970s and 1980s."
TS	6	56	7	4	Change this paragraph to read: "It is likely that the ocean warmed between 700–2000 m from 1957 to 2009, based on five-year averages. It is likely that the ocean

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					warmed from 3000 m to the bottom from 1992 to 2005, while no significant trends in global average temperature were observed between 2000 and 3000 m depth from circa 1992 to 2005. Below 3000 m depth, the largest warming is observed in the Southern Ocean. [3.2.4, 3.5.1, Figure 3.2b, Figure 3.3, FAQ 3.1]."
TS	6	56			Change "1957 to 2010" to "1957 to 2009" to match P3L34, P10L41, & P11L423; Yes see following Ch03 comment regarding TS page 6 line 56 to page 7 line 4
TS	7	11			insert *high confidence* in line 11 before, "with"
TS	7	12			add line of cite " {Boxes 3.1, 13.1}" after "."
TS	7	13			insert "%" after "3" so that "each account for 3 of" reads "each account for 3% of".
TS	7	14			insert *high confidence* at the end of line 14
TS	7	24	7	26	In order to be consistent with Chapter 3 formulation, change "It is likely that the ocean warmed between 700 and 2000 m from 1957 to 2010, based on 5-year averages. It is likely that the ocean warmed from 3000 m to the bottom from 1992 to 2005, when sufficient observations became available for a global assessment. No significant trends in global average temperature were observed between 2000 and 3000 m depth for either overlapping time period. The largest changes in deep ocean temperature have been observed close to the sources of deep and bottom water in the northern North Atlantic and especially in the Southern Ocean, with anomaly amplitudes lessening along the routes through which these waters spread. {3.2.4, 3.5.1}" to "It is likely that the ocean warmed between 700-2000 m from 1957 to 2009, based on 5-year averages. It is likely that the ocean warmed from 3000 m to the bottom from 1992 to 2005, while no significant trends in global average temperature were observed between 2000 and 3000 m depth from circa 1992 to 2005. Below 3000 m depth, the largest warming is observed in the Southern Ocean. {3.2.4, 3.5.1; Figures 3.2b, 3.3; FAQ 3.1}"
TS	7	36			replace "[5.4]" by "[5.4.2]"
TS	7	43			replace "[5.4]" by "[5.4.2]"
TS	7	47			replace "[5.4]" by "[5.4.1]"
TS	8	5			Change 1950 to 1951
TS	8	7			Remove sentence beginning "Available…"
TS	8	10			Change 1900 to 1901
TS	8	11			Add sentence regarding other latitudes as in agreed SPM precipitation bullet and reference to new TS precipitation figure provided by author team to TSU which consists of a six panel figure (3 datasets by 2 periods). New sentence reads: "For other latitudes area-averaged long-term positive or negative trends have low confidence (see TFE.1. Figure 1) "
TS	8	11			Change 1950 to 1951
TS	8	45			Add text after "per decade" to "per decade (range of 0.45 to 0.51 million km2 per decade)"
TS	8	49			Change text "per decade" to "per decade (0.73 to 1.07 million km2 per decade)"
TS	8	50			replace "There is medium confidence from reconstructions that the current (1980 to 2012) summer sea-ice retreat and increase in sea-surface temperatures in the Arctic are anomalous in the perspective of at least the last 2,000 years." by "There is medium confidence from reconstructions that the current (1980 to 2012) Arctic summer sea-ice retreat was unprecedented and sea-surface temperatures were anomalously high in the perspective of at least the last 1,450 years."; italicize "medium confidence"
TS	8	56			change "2-months" to "3 months".
TS	9	10			Add text "per decade" to read "per decade (0.13 to 0.20 million km2 per decade)"
TS	9	10			insert to give "1979 and 2012 (very high confidence)"
TS	9	12			insert before {4.2.3.} to give... "There are also contrasting regions around the Antarctic where the ice-free season has lengthened, and others where it has decreased over the satellite period (high confidence) {4.2.3.}."
TS	9	16			Change paragraph from "There is very high confidence—with a very few regional exceptions—that, since AR4, overall glaciers world-wide have continued to shrink as revealed by the time series of measured changes in glacier length, area, volume and mass (Figure TS.1, Figure TS.3). Measurements of glacier change have increased substantially in number since AR4. Most of the new data sets, along with a globally complete glacier inventory, have been derived from satellite remote

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					sensing {4.3.1, 4.3.3}" to "There is very high confidence that glaciers world-wide are persistently shrinking as revealed by the time series of measured changes in glacier length, area, volume and mass (Figure TS.1, Figure TS.3). The few exceptions are regionally and temporally limited. Measurements of glacier change have increased substantially in number since AR4. Most of the new data sets, along with a globally complete glacier inventory, have been derived from satellite remote sensing {4.3.1, 4.3.3} "
TS	9	22			Replace "most ice was lost" with "the largest contributions to global glacier ice loss were"
TS	9	48			Figure TS.3: change "in terms of sea level equivalent (in millimetres)" to "in terms of mass (Gt) and sea level equivalent (mm)"
TS	10	50			Insert "tropospheric" before "water vapour"
TS	10	55	11	5	In order to support Figure SPM.2, Figure 2.29 is included in the Technical Summary as TFE.1, Figure 2. Revise the corresponding revised TFE.1 text from "When virtually all the land area is filled in using a reconstruction method, the resulting time series of global land precipitation shows little change since 1900." to "Some regional precipitation trends appear to be robust (TFE.1, Figure 2), but when virtually all the land area is filled in using a reconstruction method, the resulting time series of global land precipitation shows little change since 1900."
TS	11	16			Replace "increases in" with "climate"
TS	11	29			Insert caption for new TFE.1 Figure 2: "TFE.1, Figure 2: Maps of observed precipitation change over land from 1901 to 2010 (left-hand panels) and 1951 to 2010 (right-hand panels) from the Climatic Research Unit (CRU), Global Historical Climatology Network (GHCN) and Global Precipitation Climatology Centre (GPCC) data sets. Trends in annual accumulation have been calculated only for those grid boxes with greater than 70% complete records and more than 20% data availability in first and last decile of the period. White areas indicate in complete or missing data. Black plus signs (+) indicate grid boxes where trends are significant (i.e., a trend of zero lies outside the 90% confidence interval). Further detail regarding the related Figure SPM.2 is given in the TS Supplementary Material. {Figure 2.29; 2.5.1}"
TS	11	33	11	34	To be consistent with Ch4, change text from "Snow cover decreased most in spring when the average extent decreased by around 8% (7 million km2) over the period 1970–2010 compared with the period 1922–1970. " to "Snow cover decreased most in June when the average extent decreased very likely by 53% (40 to 66%) over the period 1967 to 2012."
TS	11	48	11	50	To be consistent with Ch12, change text from "It is virtually certain, that precipitation increase will be much smaller, approximately 2% K–1, than the rate of lower tropospheric water vapour increase (~7% K–1), due to global energetic constraints. It is virtually certain that changes of average precipitation in a much warmer world will not be uniform, with some regions experiencing increases, and others with decreases or not much change at all. " to "The precipitation increase is projected to be much smaller (about 2% C–1) than the rate of lower tropospheric water vapour increase (about 7% C–1), due to global energetic constraintsChanges of average precipitation in a much warmer world will not be uniform, with some regions experiencing increases, and others with decreases or not much change at all."
TS	11	50			Replace "high latitudes" with "high latitude land masses"
TS	11	52			Add "and subtropical" after "mid-latitude"
TS	12	2			Change 'multi model mean' to 'multi model mean change' in two instances on page 12 line 2-3, also page 85 line 7-8
TS	12	10	12	11	Replace sentence starint gwith "The high northern…" with "Increased runoff is likely in high northern latitudes, and consistent with the projected precipitation increases there."
TS	12	21			Insert "and changes in the Earth's gravitational field" after "the land"
TS	12	24			Change "2.0" to "1.9" and "3.5" to "3.6"
TS	12	26	12	26	Change range of CO2 concentrations to 350 and 450 ppm, consistent with Ch5
TS	12	26	12	30	Replace "...sedimentary records suggest periodic deglaciation of West Antarctica and parts of the East Antarctica. Ice sheet models suggest near-complete deglaciation of the Greenland, West Antarctica and partial deglaciation of East Antarctica. Together, the evidence suggests that GMSL was above present levels at that time, but did not exceed 20 m above present (high confidence)" to "there is high confidence that GMSL was above present, implying reduced volume of polar ice sheets. The best estimates from various methods imply with high confidence that sea level has not exceeded +20 m during the warmest periods of the Pliocene, due to deglaciation of the Greenland and West Antarctic ice sheets and areas of the East Antarctic ice sheet. {5.6.1, 13.2}."
TS	12	32	12	38	Replace "During the Last Interglacial Period (about 129,000 to 116,000 kayears ago), when peak global warmth was not more than 2°C above pre-industrial temperatures, and peak global annual SSTssea surface temperatures were 0.7 [0.1 to 1.3] °C warmer (medium confidence), maximum GMSL was at least 5 m

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					higher than at present (very high confidence), but did not exceed 10 m (high confidence)" with "There is very high confidence that maximum global mean sea level during the last interglacial period (129,000 to 116,000 years ago) was, for several thousand years, at least 5 m higher than present and high confidence that it did not exceed 10 m above present, implying substantial contributions from the Greenland and Antarctic ice sheets. [5.6.2, 13.2.1] This change in sea level occurred in the context of different orbital forcing and with high-latitude surface temperature, averaged over several thousand years, at least 2°C warmer than present (high confidence). [5.3.4]
TS	12	40	12	47	Replace "Based on proxy data, the magnitude of centennial-scale global mean sea level variations did not exceed 0.25 m over the past few millennia (medium confidence). The current rate of global mean sea level change, starting in the late 19th to early 20th century, is, with medium confidence, unusually high in the context of centennial-scale variations of the last two millennia. Tide gauge data also indicate a likely acceleration during the last two centuries. Based on proxy and instrumental data, it is virtually certain that the rate of global mean sea level rise has accelerated during the last two centuries, marking the transition from relatively low rates of change during the late Holocene (order tenths of mm yr–1) to modern rates (order mm yr–1). {3.7, 5.6.3, 13.2}" with "Proxy and instrumental sea level data indicate a transition in the late 19th to the early 20th century from relatively low mean rates of rise over the previous two millennia to higher rates of rise (high confidence). It is likely that the rate of global mean sea level rise has continued to increase since the early 20th century {3.7, 3.7.4, 12 5.6, 13.2}"
TS	12	52			Change 1930 to 1920
TS	12	54			Change "0.000 to 0.013 [–0.002 to 0.019]" to "0.000 [–0.002 to 0.002] to 0.013 [–0.007 to 0.019]"
TS	13	2			Delete "global mean"
TS	13	6	13	9	replace "Ocean thermal expansion and glacier mass loss are very likely the dominant contributors to GMSL rise during the 20th century" with "Ocean thermal expansion and glacier mass loss are the dominant contributors to GMSL rise during the 20th century (high confidence)."
TS	13	13	13	15	Revise "Medium confidence in global glacier mass balance models used for projections of global changes arises from the ability of the models of the well-observed glaciers to reproduce time series of historical changes of those glaciers using observed climate input." to "Medium confidence in global glacier mass balance models used for projections of glacier changes arises from the process-based understanding of glacier surface mass balance, the consistency of observations and models of glacier changes, and the evidence that Atmosphere–Ocean General Circulation Model (AOGCM) climate simulations can provide realitistic climate input."
TS	13	44	13	57	Caption of TFE.2 Figure 1 revised to read: "(a) The observed and modelled sea level for 1900 to 2010. (b) The rates of sea level change for the same period, with the satellite altimeter data shown as a red dot for the rate. (c) The observed and modelled sea level for 1961 to 2010. (d) The observed and modelled sea level for 1990 to 2010. Panel (e) compares the sum of the observed contributions (orange) and the observed sea level from the satellite altimeter data (red). Estimates of GMSL from different sources are given, with the shading indicating the uncertainty estimates (two standard deviations). The satellite altimeter data since 1993 are shown in red. The grey lines in panels (a)-(d) are the sums of the contributions from modelled ocean thermal expansion and glaciers (excluding glaciers peripheral to the Antarctic ice sheet), plus changes in land-water storage (see Figure 13.4). The black line is the mean of the grey lines plus a correction of thermal expansion for the omission of volcanic forcing in the Atmosphere–Ocean General Circulation Model (AOGCM) control experiments (see Section 13.3.1). The dashed black line (adjusted model mean) is the sum of the corrected model mean thermal expansion, the change in land water storage, the glacier estimate using observed (rather than modelled) climate (see Figure 13.4), and an illustrative long-term ice-sheet contribution (of 0.1 mm yr–1). The dotted black line is the adjusted model mean but now including the observed ice-sheet contributions, which begin in 1993. Because the observational ice-sheet estimates include the glaciers peripheral to the Greenland and Antarctic ice sheets (from Section 4.4), the contribution from glaciers to the adjusted model mean excludes the peripheral glaciers (PGs) to avoid double counting."
TS	14	23	14	26	Revise SLR projections to "0.26 to 0.55 m (RCP2.6), 0.32 to 0.63 m (RCP4.5), 0.33 to 0.63 m (RCP6.0), and 0.45 to 0.82 m (RCP8.5)." i.e. add 0.01 m to the upper numbers. Revise the range for RCP8.5 at 2100 to "0.52 to 0.98 m".
TS	14	38	14	39	replace with: process-based model projections, but there is no consensus in the scientific community about their reliability and there is thus low confidence in their projections.
TS	15	7			Revise “It is likely that since 1950 the number of heavy precipitation events over land has increased in more regions than it has decreased. Regional trends vary but confidence is high for North America with very likely trends towards heavier precipitation events." to "It is likely that since about 1950 the number of heavy precipitation events over land has increased in more regions than it has decreased. Confidence is highest for North America and Europe where there have been likely increases in either the frequency or intensity of heavy precipitation with some seasonal and regional variations. It is very likely that there have been trends towards heavier precipitation events in central North America."
TS	15	16	15	17	Revise "During the last millennium, there is high confidence for the occurrence of droughts of greater magnitude and longer duration than observed since 1900 in many regions." to "There is high confidence for droughts during the last millennium of greater magnitude and longer duration than those observed since the beginning of the 20th century in many regions."

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TS	16	4			delete "approximately" before "1.9 to 3.6°C"
TS	16	4			Replace "2°C to 3.5°C" by "1.9 to 3.6°C"
TS	16	12	16	12	Change "365 [335 to 395]" to read "375 [345 to 405]"
TS	16	12			Revise "In 2000–2009, average fossil fuel and cement manufacturing emissions were 7.8 [7.2 to 8.4] PgC yr–1, with an average growth rate of 3.2% yr–1 (Figure TS.4)." to "In 2002–2011, average fossil fuel and cement manufacturing emissions were 8.3 [7.6 to 9.0] PgC yr–1 (high confidence), with an average growth rate of 3.2% yr–1 (Figure TS.4)."
TS	16	25	16	25	Change "residual terrestrial sink" to read "residual land sink"
TS	16	34			Revise "Land use change emissions between 2000 and 2009 are dominated by tropical deforestation, and are estimated at 1.1 [0.3 to 1.9] PgC yr–1,..." to "Land use change emissions between 2002 and 2011 are dominated by tropical deforestation, and are estimated at 0.9 [0.1 to 1.7] PgC yr–1 (medium confidence),..."
TS	16	39	16	39	Change "545 [460 to 630]" to read "555 [470 to 640]"
TS	16	41	16	41	Revise "278 [275 to 281] ppm in 1750 to 390.5 ppm in 2011" to "278 [273 to 283] ppm in 1750 to 390.5 [390.4 to 390.6] ppm in 2011"
TS	17	17	17	17	Change "150 [60 to 240] PgC between 1750 and 2010" to read "160 [70 to 250] PgC between 1750 and 2011"
TS	17	28			Revise "It is very likely that oceanic uptake of anthropogenic CO2 results in gradual acidification of the ocean. The pH of seawater has decreased by 0.1 since the beginning of the industrial era,..." to "Oceanic uptake of anthropogenic CO2 results in gradual acidification of the ocean. The pH of ocean surface water has decreased by 0.1 since the beginning of the industrial era (high confidence),..."
TS	17	36	17	36	Revise "720 [695 to 745] ppb" to "722 [697 to 747] ppb"
TS	17	53			Change Section "TS.2.8.4 Nitrogen" to "TS.2.8.4 Nitrous Oxide"
TS	19	32			Delete "well-mixed" in caption, change WMGHG to GHG accordingly
TS	19	44	19	44	Revise "RF of 0.17 [0.15 to 0.19]" to "RF of 0.17 [0.14 to 0.20]"
TS	19	47	19	47	Revise "N2O is now likely the third largest WMGHG contributor to RF. " to "Since AR4, N2O has overtaken CFC-12 to become the third largest WMGHG contributor to RF. "
TS	20	31			Insert ", and is attributable primarily to black carbon" after "adjustments"
TS	20	41	20	42	Remove " and inverse studies grouped together"
TS	21	44	21	46	Revise "In the event that such an association exists, it is very unlikely to be due to cosmic ray–induced nucleation of new aerosol particles." to "In the event that such an association existeds, a mechanism other than it is very unlikely to be due to cosmic ray–induced nucleation of new aerosol particles would be needed to explain it."
TS	21	56	21	57	Revise "There has not been any major volcanic eruption since Mt Pinatubo in 1991, which caused a 1-year RF of about –3.7 W m–2, but several smaller eruptions have caused an RF for the years 2008–2011 of –0.10 [–0.13 to –0.07] W m–2 (high confidence), twice as strong in magnitude compared to 1999–2002. The smaller eruptions have led to better understanding of the dependence of RF on the amount of material from and time of the year of high-latitude injections." to "There has not been any major volcanic eruption since Mt Pinatubo in 1991, which caused a 1-year RF of about –3.0 W m–2, but several smaller eruptions have caused an RF averaged over the years 2008–2011 of –0.11 [–0.15 to –0.08] W m–2 (high confidence), twice as strong in magnitude compared to the 1999–2002 average. The smaller eruptions have led to better understanding of the dependence of RF on the amount of material from high-latitude injections as well as the time of the year when they take place."
TS	22	11	22	11	Revise "There is very high confidence that the total anthropogenic RF " to "The total anthropogenic RF"
TS	22	18			Change '(10 to 95%)' to '(at least 30%)'
TS	22	30			Replace "have a clear" with "are virtually certain to cause"
TS	22	38	22	45	Replace Figure TS.7 to include all RF/ERF values. Clarify Figure caption from "Values are RF except for the effective radiative forcing (ERF) of aerosol–cloud interactions (ERFaci). An additional rapid adjustment to aerosol–radiation interactions of –0.1 [–0.3 to +0.1] W m–2 is attributable primarily to black carbon (ERFari-RFari in Figure TS.6)." to "Values are RF except for the effective radiative forcing (ERF) due to aerosol–cloud interactions (ERFaci) and rapid adjustment

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					associated with the RF due to aerosol-radiation interaction (RFari Rapid Adjust.).. Note that the total RF due to aerosol-radiation interaction (–0.35 Wm–2) is slightly different from the sum of the RF of the individual components (–0.33 Wm–2). The total RF due to aerosol-radiation interaction is the basis for Figure SPM.5. Secondary organic aerosol has not been included since the formation depends on a variety of factors not currently sufficiently quantified. The ERF of contrails includes contrail induced cirrus. Combining ERFaci –0.45 [–1.2 to 0.0] Wm–2 and rapid adjustment of ari –0.1 [–0.3 to +0.1] Wm–2 results in an integrated component of adjustment due to aerosols of –0.55 [–1.33 to –0.06] Wm–2. "
TS	23	4	23	4	Change "Over the 21st century, there is very high confidence that the anthropogenic radiative forcing will increase" to "Over the 21st century, anthropogenic RF is projected to increase under the Representative Concentration Pathways".
TS	23	25	23	28	Change "extremely likely" to "extremely likely to be positive". Remove "or increased natural CO2 sources"
TS	23	43	23	43	Revise statement from "Release of carbon from thawing permafrost is very likely to provide a positive feedback, but there is limited confidence in quantitative projections of its strength" to "There is high confidence that release of carbon from thawing permafrost provides a positive feedback, but there is low confidence in quantitative projections of its strength"
TS	26	27	26	27	Revise text from "Because solar forcing has very likely decreased since the advent of direct satellite measurements of total solar irradiance in 1978, ..." to "Because solar forcing has very likely decreased over a period with direct satellite measurements of solar output from 1986 to 2008, ..."
TS	27	44			add line of cite " {Box 9.2}" after "."
TS	28	16	28	26	Correct numbers in this paragraph: 0.23 ± 0.11 to 0.22 [0.1 to 0.34]; 0.34 ± 0.10 to 0.32 [0.22 to 0.42]; 0.30 ± 0.10 to 0.31 [0.19 to 0.40]; 0.13 [0.06 to 0.31] to 0.12 [0.05 to 0.29]; 0.19 [0.10 to 0.40] to 0.19 [0.09 to 0.39]; 0.17 [0.08 to 0.36] to 0.18 [0.08 to 0.37]; 0.04 to 0.05
TS	28	28	28	40	Correct numbers in this paragraph: –0.14 ± 0.10 to –0.16 [–0.27 to –0.06]; 0.0 ± 0.01 to 0.01 [–0.00 to +0.01]; –0.04 to –0.06; revise line of cite to table 8.5.
TS	28	46			Change 0.05 to 0.03
TS	29	44			Corrected Figure Box TS.3-1 included; adapted figure caption
TS	30	10	30	11	Change "...(iii) global mean sea level relative to 1990 (bottom row)." to "... (iii) global mean sea level relative to 1961-1990 (bottom row)."
TS	30		30		Revise caption: spell out data set names rather than institution names; delete "only for the SRES-A1B scenario that"; Move "The publication years of the assessment reports are shown." to be placed before: "(top: right) Same observed globally averaged CO2 concentrations"; move "Appendix 1.A for details on the data and calculations used to create these figures." before "See Chapters 1, 11"; Change "The bars are the "likely ranges (medium confidence) for global mean sea level rise at 2081-2100 with respect to 1986-2005 following the four RCPs." to "The bars are the "likely ranges" (medium confidence) for global mean sea level rise at 2035 with respect to 1961-1990 following the four RCPs."
TS	31	5	31	8	Replace the sentence starting with "Overall the observed temperature record lies within the total range [...]" by "Observations are generally well within the range of the extent of the earlier IPCC projections."
TS	31	28			On global mean sea level: In the first sentence replace "relative to 1990" by "relative to 1961-1990"
TS	32	37	32	37	Revise "On a global scale, surface and subsurface salinity changes (1955–2004) over the upper 250 m of the water column are very unlikely to be explained by natural variability. However, the observed salinity changes match the modelled distribution of forced changes (GHGs and tropospheric aerosols)." to "On a global scale, surface and subsurface salinity changes (1955–2004) over the upper 250 m of the water column do not match changes expected from natural variability but do match the modelled distribution of forced changes."
TS	32	41	32	42	Section 4.3: delete physical; change from "our physical understanding of the physical processes" to "our understanding of the physical processes"
TS	32	51	32	53	Revise text from "It is very likely that oceanic uptake of anthropogenic carbon dioxide has resulted in the acidification of surface waters." to read "There is high confidence that the pH of ocean surface seawater decreased by about 0.1 since the beginning of the industrial era as a consequence of the oceanic uptake of anthropogenic CO2. "
TS	33	24			Figure TFE.4, Figure 1: Figure updated to be consistent with Chapter 13 Energy Box Figure.
TS	34	19			Insert "(high confidence)" after "uncertainties"
TS	34	55			Replace "...surface melting of Greenland since 1990" with "...surface melting of Greenland since 1993"
TS	35	5			Replace the sentence "These factors combined with incomplete models in Antarctic ice sheet mass loss result in low confidence in scientific understanding, and

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					attribution of the mass balance of Antarctica to human influence is premature. " with "Due to a low level of scientific understanding there is low confidence in attributing the causes of the observed loss of mass from the Antarctic ice sheet since 1993."
TS	35	51			TFE.5: Replace "Atlantic innertropical convergence zone" by "Intertropical Convergence Zone"
TS	35	55	35	56	Replace "a marked reduction in the strength of the AMOC was driven by a sudden freshwater release in the final stages of North American ice sheet melting" with "a sudden freshwater release occurred during the final stages of North America ice sheet melting"
TS	36	1			Replace "that the circulation was restored" with "a marked reduction in the strength of the AMOC followed by a rapid recovery"
TS	36	5	36	8	Revise text "It remains very likely that the AMOC will weaken over the 21st century relative to pre-industrial values with a best estimate decrease in 2100 of about 20 to 30% for the RCP4.5 scenario and 36 to 44% for the RCP8.5 scenario, but there is low confidence on the magnitude of weakening. " to read "It remains very likely that the AMOC will weaken over the 21st century relative to preindustrial values. Best estimates and ranges for the reduction from CMIP5 are 11% (1 to 24%) for the RCP2.6 scenario and 34% (12 to 54%) for the RCP8.5 scenario, but there is low confidence on the magnitude of weakening."
TS	37	23			replace "remains above approximately 400 ppm" by "stays within, or above, the range of 350–450 ppm"
TS	37	28	37	28	Replace "Taking into account the increased vulnerability of the ice sheet as the surface elevation decreases due to the loss of ice, a study with a dynamical ice sheet suggests the threshold could be as low as 1°C." with "The one study with a dynamical ice sheet suggests the threshold is greater than about 1°C (low confidence) global mean warming with respect to pre-industrial."
TS	37	28			Insert "(medium confidence)" after "4°C"
TS	39	32			Replace "Detection and attribution signals (decadal averages) in the climate system" with "Comparison of observed and simulated change in the climate system"
TS	39	34			Insert "(decadal averages)" after "time series"
TS	39				Remove footnote and refer to supplementary material instead
TS	40	53			Revise "1960 to the present" with "1961 to 2005"
TS	41	13			about two-thirds → the majority
TS	42	50			replace "intervals" by "periods"
TS	42	52			replace "these intervals were not as synchronous across seasons and regions as the" by " "these regional warm periods were not as synchronous across regions as the"
TS	43	20			Before "All lines…" insert "These instrumental data are not necessarily those used in calibration of the reconstrctions, and thus may show greater or lesser correspondence with the reconstructions than the instrumental data actually used for calibration; cutoff timing may also lead to end effects for smoothed data shown."
TS	44	6		32	Box TS.6: replace "no scenarios were included" to "no scenarios were available"
TS	46	1	46	2	revise text from "In the case of CH4 it likely extends the range up to 500 ppb above RCP8.5 and 270 ppb below RCP2.6 through to 2100, with smaller ranges in the near term." to "In the case of CH4, by year 2100 the likely range of RCP8.5 CH4 abundance extends 520 ppb above the single-valued RCP8.5 CH4 abundance, and RCP2.6 CH4 extends 230 ppb below RCP2.6 CH4."
TS	46	4	46	4	Change "there is low confidence in projections of natural forcing" to "there is very low confidence in projections of natural forcing"
TS	46	9	46	9	The section discussing natural forcing is section 11.3.6, not 11.3.1.
TS	47	32	47	33	delete "medium confidence" in both instances
TS	47	40	47	42	delete confidence levels (high confidence, medium confidence)
TS	47	51	47	52	Replace "based on an assessment of observationally-constrained projections and predictions initialized with observations" with "based on multiple lines of evidence".
TS	48	12			Replace "pre-industrial" with1850-1900 mean"

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TS	48	23	48	23	Revise text "There is high confidence that Higher concentrations of GHGs and lower amounts of sulphate aerosol lead to greater warming." to "Higher concentrations of GHGs and lower amounts of sulphate aerosol lead to greater warming."
TS	48	26	48	28	Revise text "In 2030, the CMIP5 multi-model ensemble mean values for global mean temperature differ by less than 0.3°C between the RCP scenarios, whereas the model spread (defined as the 5 to 95% range of the decadal means of the models) is around 0.8°C." to "In 2030, the CMIP5 ensemble median values for global mean temperature differ by at most 0.2°C between the RCP scenarios, whereas the model spread (defined as the 17 to 83% range) for each RCP is around 0.4°C."
TS	48	33			Replace "pre-industrial" with1850-1900 mean"
TS	48	55			change "most regions" to " most land regions"
TS	49	55			at the end of the bracket add "for at least five consecutive years"
TS	49	55			replace "(sea ice extent less than 10^6 km2)" by "(sea ice extent less than 10^6 km2 for at least five consecutive years)"
TS	50	15	50	26	Replace entire Air Quality paragraph with: "The range in projections of air quality (O3 and PM2.5 in surface air) is driven primarily by emissions (including CH4), rather than by physical climate change (medium confidence). The response of air quality to climate-driven changes is more uncertain than the response to emission-driven changes (high confidence). Globally, warming decreases background surface O3 (high confidence). High CH4 levels (RCP8.5, SRES A2) can offset this decrease, raising 2100 background surface O3 on average by about 8 ppb (25% of current levels) relative to scenarios with small CH4 changes (RCP4.5, RCP6.0) (high confidence). On a continental scale, projected air pollution levels are lower under the new RCP scenarios than under the SRES scenarios because the SRES did not incorporate air quality legislation (high confidence). [11.3.5, 11.3.5.2; Figures 11.22 and 11.23ab, AII.4.2, AII.7.1–AII.7.4] Observational and modelling evidence indicates that, all else being equal, locally higher surface temperatures in polluted regions will trigger regional feedbacks in chemistry and local emissions that will increase peak levels of O3 and PM2.5 (medium confidence). Local emissions combined with background levels and with meteorological conditions conducive to the formation and accumulation of pollution are known to produce extreme pollution episodes on local and regional scales. There is low confidence in projecting changes in meteorological blocking associated with these extreme episodes. For PM2.5, climate change may alter natural aerosol sources (wildfires, wind-lofted dust, biogenic precursors) as well as precipitation scavenging, but no confidence level is attached to the overall impact of climate change on PM2.5 distributions. [11.3.5, 11.3.5.2, Box 14.2]"
TS	50	36	50	47	replace all "pre-industrial" with "1850-1900 " in this paragraph
TS	50	46			change "as likely as not" with "about as likely as not"
TS	50	54			Replace " Those ranges are interpreted as “likely” changes at the end of the 21st century." by ", based on annual means. The 1.64 standard deviation range based on the 20 yr averages 2081-2100, relative to 1986-2005, are interpreted as likely changes for the end of the 21st century."
TS	51	8			Insert "relative to the reference period of 1986–2005" after "century"
TS	52	53			replace "(sea ice extent less than 10^6 km2)" by "(sea ice extent less than 10^6 km2 for at least five consecutive years)"
TS	53	11			Replace "Projections of the Northern Hemisphere spring snow covered area by the end of the 21st century vary between –7% (RCP2.6) and –25% (RCP8.5) decrease and are fairly coherent among models (Figure TS.18)." by "Projections of the NH spring snow covered area by the end of the 21st century vary between a decrease of 7 [3 to 10] % (RCP2.6) and 25 [18 to 32] % (RCP8.5)"."
TS	53	40	53	44	Replace "The strongest warming [...] by the end of the century." with: "The strongest ocean warming is projected for the surface in subtropical and tropical regions. At greater depth the warming is projected to be most pronounced in the Southern Ocean. Best estimates of ocean warming in the top one hundred meters are about 0.6°C (RCP2.6) to 2.0°C (RCP8.5), and about 0.3°C (RCP2.6) to 0.6°C (RCP8.5) at a depth of about 1 km by the end of the 21st century."
TS	54	5	54	6	TFE.6: delete bracket after "of equilibrium climate sensitivity", i.e. delete "(ECS, the equilibrium change in annual mean global surface temperature following a doubling of the atmospheric carbon dioxide (CO2) concentration)."
TS	54	7	54	8	change "very high confidence" to "high confidence"
TS	54	8			delete 'strongly'
TS	54	25			add reference to Section 9.7.2.2
TS	54	55			Replace "Together with results from feedback analysis and paleoclimate constraints these studies" by "Together with paleoclimate constraints but without

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					considering the CMIP based evidence these studies"
TS	55	36			Delete "Labels refer to studies since AR4" from caption
TS	56	33			Update discussion on ECS range explaining the lack of a best estimate in AR5: "In contrast to AR4, no best estimate for ECS is given because of a lack of agreement on the best estimate across lines of evidence and studies and an improved understanding of the uncertainties in estimates based on the observed warming. Climate models with ECS values in the upper part of the likely range show very good agreement with observed climatology, whereas estimates derived from observed climate change tend to best fit the observed surface and ocean warming for ECS values in the lower part of the likely range. In estimates based on the observed warming the most likely value is sensitive to observational and model uncertainties, internal climate variability and to assumptions about the prior distribution of ECS. In addition, "best estimate" and "most likely value" are defined in various ways in different studies."
TS	56	39			add line of cite " {6}" after "."
TS	57	1			delete "more than"
TS	57	18	57	18	Change "(CMIP5 model spread)" to read "(values quoted to nearest 5 PgC, range±1 standard deviation derived from CMIP5 model results)"
TS	57	19	57	21	Delete last sentence that starts with, "It is about as likely as not…" and replace with, "By the end of the 21st century, about half of the models infer emissions slightly above zero, while the other half infer a net removal of CO2 from the atmosphere."
TS	57	38	57	40	TS5.6: delete first "(CMIP5 model spread)", move second "(CMIP5 model spread)" to the end of the sentence
TS	58	1	58	1	change "will decrease by 3 to 6%" to "will decrease by a few percent"
TS	58	10			add line of cite " {6.4}" after "."
TS	58	26	58	26	replace "45%" by "less than half"
TS	58	46	58	50	revise "Multi-model mean (blue line) and the uncertainty interval (±2 standard deviations, shading) simulated during 100 years (left) and 1 kyr (right) following the instantaneous emission pulse of 100 PgC." to "Multi-model mean (line) and the uncertainty interval (maximum model range, shading) simulated during 100 years (left) and 1 kyr (right) following the instantaneous emission pulse of 100 PgC (blue) and 5,000 PgC (red)."
TS	60	10			add line of cite " {12.5.4}" after "."
TS	60	23			Replace “relative to preindustrial (assuming 0.61°C warming has occurred prior to 1986–2005)“ by “relative to the average from year 1850 to 1900 (assuming 0.61°C warming from 1850-1900 to 1986–2005)“
TS	60	26			add "It is more likely than not to exceed 2°C for RCP4.5 (medium confidence).”
TS	60	29			Delete “All targets here are defined as global average surface temperature change relative to preindustrial”
TS	61	3			Replace “The assessment of TCRE, limiting the warming caused by anthropogenic CO2 emissions alone to be likely less than 2°C, total CO2 emissions from all anthropogenic sources would need to be below a cumulative budget of about 1000 PgC over the entire industrial era. About half, estimated in the range of 460 to 630 PgC, of this budget was already emitted by 2011 (TFE.8, Figure 1a).” by “Based on the assessment of TCRE (assuming a normal distribution with a ±1 standard deviation range of 0.8-2.5°C per 1000 PgC), limiting the warming caused by anthropogenic CO2 emissions alone (i.e., ignoring other radiative forcings) to less than 2°C since the period 1861–1880 with a probability of >33%, >50% and >66%, total CO2 emissions from all anthropogenic sources would need to be below a cumulative budget of about 1570 PgC, 1210 PgC and 1000 PgC since 1870, respectively. An amount of 515 [445 to 585] PgC was emitted between 1870 and 2011 (TFE.8, Figure 1a).”
TS	61	7	61	9	TFE.8: change "(TFE.8, Figure 1a)" to "(TFE.8, Figure 1a,b)"; delete second "(TFE.8, Figure 1a)"
TS	61	17			add: "When accounting for the non-CO2 forcings as in the RCP scenarios, compatible carbon emissions since 1870 are reduced to about 900 PgC, 820 PgC and 790 PgC to limit warming to less than 2°C since the period 1861–1880 with a probability of >33%, >50%, and >66%, respectively. These estimates were derived by computing the fraction of the Coupled Model Intercomparison Project Phase 5 (CMIP5) Earth System Models (ESMs) and Earth System Models of Intermediate Complexity (EMICs) that stay below 2°C for given cumulative emissions following RCP8.5, as shown in TFE.8 Fig. 1c. The non-CO2 forcing in RCP8.5 is higher than in RCP2.6. Because all likelihood statements in calibrated IPCC language are open intervals, the estimates provided are thus both conservative and consistent choices valid for non-CO2 forcings across all RCP scenarios. There is no RCP scenario which limits warming to 2°C with probabilities of >33% or >50%, and which could be used to directly infer compatible cumulative emissions. For a probability of >66% RCP2.6 can be used as a comparison. Combining the average back-calculated fossil fuel carbon emissions for RCP2.6 between 2012 and 2100 (270 PgC) with the average historical estimate of 515 PgC gives a total

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					of 785 PgC, i.e. 790 PgC when rounded to 10 PgC. As the 785 PgC estimate excludes an explicit assessment of future land-use change emissions, the 790 PgC value also remains a conservative estimate consistent with the overall likelihood assessment. The ranges of emissions for these three likelihoods based on the RCP scenarios are rather narrow, as they are based on a single scenario and on the limited sample of models available (TFE.8 Fig. 1c). In contrast to TCRE they do not include observational constraints or account for sources of uncertainty not sampled by the models."
TS	61	24	61	50	Update Figure 1 TFE 8 and caption; the two grey shades for the TCRE and the 1% were inadvertantly lost in TFE.8, Figure 1 in the Final Draft version; change "(2001–2010, 2041–2050 and 2091–2100)" to "(2000–2009, 2040–2049 and 2090–2099)"; change "2001–2010 is taken from the CMIP5 historical runs prolonged by RCP8.5 for 2005–2010" to "2000–2009 is taken from the CMIP5 historical runs prolonged by RCP8.5 for 2006–2010 "; change "from 1850 to 2011" to "from 1870 to 2011"
TS	62	38			Revise sentence to read "CDR would likely need to be deployed at large scale…."
TS	62	40			Sentence should read "It is virtually certain that CO2 removals from the atmosphere…"
TS	63	19	63	29	The projections need to be updated. Change to "0.26 to 0.55 m (RCP2.6), 0.32 to 0.63 m (RCP4.5), 0.33 to 0.63 m (RCP6.0), and 0.45 to 0.82 m (RCP8.5)." i.e. add 0.01 m to the upper numbers. Change the range for RCP8.5 at 2100 to "0.52 to 0.98 m". Regarding the divergence of the scenarios, change "by the end of the century, they have a spread of about 0.3 m" to "by the late 21st century, they have a spread of 0.25 m".
TS	63	47			Delete "emissions" before scenarios
TS	64	9			Change the RCP8.5 rate to "11 [8-16] mm yr-1".
TS	64	13			Insert ", accounting for 15-35%." after "Glaciers are the next largest".
TS	64	46	64	50	replace " The few available .." with: The few available model results that go beyond 2100 indicate global mean sea level rise above the pre-industrial level by 2300 to be less than 1 m for a radiative forcing that corresponds to CO2 concentrations that peak and decline and remain below 500 ppm, as in the scenario RCP2.6. For a radiative forcing that corresponds to a CO2 concentration that is above 700 ppm but below 1500 ppm, as in the scenario RCP8.5, the projected rise is 1 m to more than 3 m (medium confidence). {13.5}
TS	65	4	65	6	Replace "Taking into account the increased vulnerability of the ice sheet as the surface elevation decreases due to the loss of ice, a study with a dynamical ice sheet suggests the threshold could be as low as 1°C" with "The one study with a dynamical ice sheet suggests the threshold is greater than about 1°C (low confidence) global mean warming with respect to pre-industrial."
TS	65	4			Insert "(medium confidence)" after "pre-industrial"
TS	65	18			insert after "instability": "Abrupt and irreversible ice loss from a potential instability of marine-based sectors of the Antarctic Ice Sheet in response to climate forcing is possible, but current evidence and understanding is insufficient to make a quantitative assessment"; Add "5.8, 13.4.3" to current line of cite.
TS	65	40			Insert "relative" before "sea level rise"
TS	65	47			Insert "relative" before "sea level change"
TS	65	48			Insert "relative" before "sea level change"
TS	65	52			Insert "relative" before "sea level change"
TS	66	1			Insert "by the end of the 21st century, with a likely increase in the early 21st century" after "extremes"
TS	66	34			Replace "very likely" with "likely"
TS	66	35			Insert "in many regions" in front of "{14.2.1}"
TS	66	40			Update TS Figure TS.24. Change caption to "based on CMIP5 ensemble from RCP2.6 (dark blue; 18 models), RCP4.5 (blue; 24), RCP6.0 (yellow; 14), and RCP8.5 (red; 26) simulations"
TS	67	14	67	15	Revise "It is virtually certain that precipitation change will vary in space" to "Precipitation change varies in space"
TS	67	40	67	41	Replace "There is low confidence in projections of future changes in the Madden-Julian Oscillation due to" with "It is currently not possible to assess how the Madden–Julian Oscillation will change owing to"
TS	67	47	67	50	Replace "El Niño-Southern Oscillation very likely remains as a dominant mode of interannual variability in the future and regional rainfall variability it induces likely

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					intensifies. Natural modulations of the variance and spatial pattern of El Niño-Southern Oscillation are so large that confidence in any projected change for the 21st century remains low." to "There is high confidence that the El Niño-Southern Oscillation (ENSO) will remain the dominant mode of natural climate variability in the 21st century with global influences in the 21st century, and that regional rainfall variability it induces likely intensifies. Natural variations of the amplitude and spatial pattern of ENSO are so large that confidence in any projected change for the 21st century remains low. "
TS	67	55			Add new paragraph: "In a warmer climate, the increase in atmospheric moisture intensifies temporal variability of precipitation even if atmospheric circulation variability remains the same. This applies to ENSO-induced precipitation variability but the possibility of changes in ENSO teleconnections complicates this general conclusion, making it somewhat regional-dependent".
TS	68	14	68	17	delete "substantially"; "change "are likely" to "is projected"; add "(medium confidence)" at the end of the sentence.
TS	69	2	69	2	Revise sentence "but confidence is low in the trends in blocking intensity and persistence." to "while the trends in blocking intensity and persistence remain uncertain. "
TS	69	32			add "unless otherwise specified.
TS	70	24			Replace "TN10p" with "TX10p"
TS	70	26			Insert "relative to 1986–2005" after "percentage change"
TS	70	33			Insert "The number of models used to calculate the multi-model mean is indicated in each panel." before "Both maps…"
TS	72	31			Change "1950" to "1951"
TS	73	29			Insert "in AOGCMs" after "clouds"
TS	74	1	74	4	replace "medium confidence" with "limited confidence; change "limited by the low confidence in projections of natural forcing" to "limited by the uncertainty in projections of natural forcing"
TS	74	4			statement starting with ("Based on..."), replace {...} by {11.1, 11.2, 11.3.1, 11.3.6; Box 11.1}
TS	74	6	74	7	Change statement to "There is medium confidence in near-term projections of a northward shift of Northern Hemisphere storm tracks and westerlies. {11.3.2}"
TS	74	19	74	19	change "limited confidence" to "low confidence
TS	75	9	75	11	Replace "used for projections is 0.61 [0.55 to 0.67] °C for 1850−1900, 0.30 [0.27 to 0.33] °C for 1961−1990, and 0.11 [0.09 to 0.13] °C for 1980−1999. {2.4.3, Tables 12.2 and 12.3}" with "is 0.61 [0.55 to 0.67] °C from 1850−1900, and 0.11 [0.09 to 0.13] °C from 1980−1999, the reference period for projections used in AR4. Likely ranges have not been assessed here with respect to earlier reference periods because methods are not generally available in the literature for combining the uncertainties in models and observations. Adding projected and observed changes does not account for potential effects of model biases compared to observations, and for natural internal variability during the observational reference period {2.4.3, 11.2; Tables 12.2, 12.3}"
TS	75	25	75	26	Replace "because contributions of radiative forcing and initial conditions to the temperature response uncertainty are larger than for 2081−2100" with "because the relative importance of natural internal variability, and uncertainty in non-greenhouse gas forcing and response, are larger than for 2081−2100"
TS	75				Update table TS.1 for sea level: 2046-2065 2081-2100 0.24 0.17 to 0.32 0.40 0.26 to 0.55 0.26 0.19 to 0.33 0.47 0.32 to 0.63 0.25 0.18 to 0.32 0.48 0.33 to 0.63 0.30 0.22 to 0.38 0.63 0.45 to 0.82
TS	77				TFE.9, Table 1, Climate extremes updated

Chapter 1: Introduction

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1	2	56	2	56	reorder the list of evidence under confidence as done in the final SPM ro read "(e.g., data, mechanistic understanding, theory, models, expert judgment)"
1	3	1	3	2	add to list under probablistic "or both, or expert judgment" to read "...expressed probabilistically (e.g., based on statistical analysis of observations or model results, or both, and expert judgement)"
1	6	28	6	28	Change cross reference from 7.3 to 7.2
1	7	55	7	55	Change cross reference from Figure 10.19 to 10.20
1	11	6	11	6	Change "better with observations" to "better with the modelling studies"
1	11	36	11	38	Delete "The range of projections from the FAR (IPCC, 1990) for CO2 is much larger than those from the scenarios used in more recent assessments."
1	13	6			Replace "confidence" with "likelihood"
1	13	13			Replace "confidence" with "likelihood"
1	13	21			Italicize "low confidence"
1	13	42			Delete "likely"
1	17	53	17	55	reorder the list of evidence under confidence as done in the final SPM ro read "(e.g., data, mechanistic understanding, theory, models, expert judgment)"
1	20	51	20	51	Change "(similar to the current global models)" to "(higher resolution than most current global models and similar to that used in today's highly resolved models)"
1	23	53	23	53	Change reference from Figure "12.3.3" to "12.3"
1	25	14	25	15	Change "(which depend on predictions of future social and economic conditions)" to "(which depend on projections of future social and economic conditions)"
1	25		25		Change reference in Table 1.3 for Decadal climate variability from "9.1" to "9.5"
1	25		25		Change reference in Table 1.3 for Temperature trends since 1998 from "10.3" to "9.4"
1	26	51	26	51	Change "researchers will be able to narrow that range in probable temperature for the next few decades" to "researchers should be able, within the limitations of the range of natural variability, to narrow that range in probable temperature in the next few decades"
1	34	11			Italicize "likely"
1	51		51		Revised Figure 1.9

Chapter 2: Observations: Atmosphere and Surface

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2	3	21	3	21	change "halons" to "some halons" one halon is not decreasing , H-1301.
2	4	19	4	19	Substitute "successively" for "significant" and add "at the Earth's surface" and change "all" to any" to make it "Each of the past three decades has been successively warmer at the Earth's surface than any previous decades in the instrumental record"
2	4	20	4	26	Replace the paragraph that starts at "The global combined land..." and ends at "...per decade)." with "The globally averaged combined land and ocean surface temperature data as calculated by a linear trend, show a warming of 0.85 [0.65 to 1.06] °C, over the period 1880–2012, when multiple independently produced datasets exist, and about 0.72°C (0.49°C to 0.89°C) over the period 1951–2012. The total increase between the average of the 1850–1900 period and the 2003–2012 period is 0.78 [0.72 to 0.85] °C and the total increase between the average of the 1850-1900 period and the reference period for projections 1986−2005 is 0.61 [0.55 to 0.67] °C, based on the single longest dataset available. For the longest period when calculation of regional trends is sufficiently complete (1901–2012), almost the entire globe has experienced surface warming. In addition to robust multi-decadal warming, global mean surface temperature exhibits substantial decadal and interannual variability. Owing 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. As one example, the rate of warming over the past 15 years (1998–2012; 0.05 [–0.05 to +0.15] °C per decade), which begins with a strong El Niño, is smaller than the rate calculated since 1951 (1951–2012; 0.12 [0.08 to 0.14] °C per decade). Trends for 15-year periods starting in 1995, 1996, and 1997 are 0.13 [0.02 to 0.24], 0.14 [0.03 to 0.24] and 0.07 [-0.02 to 0.18], respectively."
2	4	21	4	22	Replace "0.89°C (0.69°C–1.08°C) over the period 1901- 2012" with "0.85 [0.65 to 1.06] °C over 1880–2012"
2	4	23	4	25	Replace this paragraph with "In addition to robust multi-decadal warming, global mean surface temperature exhibits substantial decadal and interannual variability. Owing 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. As one example, the rate of warming over the past 15 years (1998–2012; 0.05 [–0.05 to +0.15] °C per decade), which begins with a strong El Niño, is smaller than the rate calculated since 1951 (1951–2012; 0.12 [0.08 to 0.14] °C per decade)."
2	4	26	4	26	Before the sentence "Several independently..." insert the sentence "Trends for 15-year periods starting in 1995, 1996, and 1997 are 0.13 [0.02 to 0.24], 0.14 [0.03 to 0.24] and 0.07 [-0.02 to 0.18], respectively."
2	4	55	5	1	Remove " because of insufficient data, particularly in the earlier part of the record. Available globally incomplete records show mixed and nonsignificant long-term trends in reported global mean changes. Further, when virtually all the land area is filled in using a reconstruction method, the resulting time series shows little change in land-based precipitation since 1900".
2	5	1	5	3	Replace the sentence starting at "Northern Hemisphere…" with "Averaged over the mid-latitude land areas of the Northern Hemisphere, precipitation has likely increased since 1901 (medium confidence before and high confidence after 1951). For other latitudinal zones area-averaged long-term positive or negative trends have low confidence due to data quality, data completeness or disagreement amongst available estimates."
2	5	23	5	23	Remove "Regional trends vary but "
2	5	23	5	24	Replace "central North America with very likely trends towards heavier precipitation events." with "North America and Europe where there have been likely increases in either the frequency or intensity of heavy precipitation with some seasonal and/or regional variation. It is very likely that there have been trends towards heavier precipitation events in central North America."
2	5	23			Remove italics on "Confidence" and "highest"
2	7	4			Remove italics on "likely"
2	7	32			Change "any other instrumental series" to "any other global instrumental series"
2	12	50	12	54	Replace this paragraph with, NF3 was added to the list of GHG in the Kyoto Protocol with the Doha Amendment, December, 2012. Arnold et al. (2013) determined 0.59 ppt for its global annual mean mole fraction in 2008, growing from almost zero in 1978. In 2011, NF3 was 0.86 ppt, increasing by 0.49 ppt since 2005. These abundances were updated from the first work to quantify NF3 by Weiss et al. (2008). Initial bottom-up inventories underestimated its emissions; based on the atmospheric observations, NF3 emissions were 1.18 ± 0.21Gg in 2011 (Arnold et al., 2013).
2	13	50	13	50	change "halons" to "some halons" one halon is not decreasing , H-1301.
2	14	29			change "HALOE (v20)" to "HALOE (v19)"

Chapter	From Page	From Line	To Page	To Line	Edit
2	14	47			Replace "Hurst, 2011" with "Hurst et al., 2011" and delete Hurst, 2011 from reference list.
2	17	7			Cpation Figure 2.7: "90% confidence" --> "95% confidence"
2	17	34			Insert ", and" between "aromatic" and "oxygenated"
2	18	19			Caption Figure 2.8: change "2010" to "2011"
2	18	48	18	49	Replace "AOD sun photometer measurements starting in 1986 at two stations in northern Germany corroborate the long-term decline of AOD in Europe" with "AOD sun photometer measurements at two stations in northern Germany, with limited regional representativity, suggest a long-term decline of AOD in Europe since 1986"
2	18	55			Change "sulphate emissions" to "sulphate (precursor) emissions"
2	19	50			Caption Figure 2.9: change "Grey areas indicate" to "White areas indicate"
2	22				add below Table 2.3: "Notes:" then add a superscript "a" with accompanying text "Trend numbers indicated refer to the subset of stations with significant changes over time—generally in regions strongly influenced by anthropogenic emissions (Figure 2.10)."
2	22				Table 2.3: change the # sybmols to superscript a
2	23	12			change "reproducible" to "robust"
2	23	35			Insert "variables" after "climate"
2	23	44			"applied to estimate" should be "developed for estimating"
2	23	48	23	49	Change "This method indicates" to "The results indicate "
2	27	20			Add ", Eastern Europe" after "Greece", to read "Greece, Eastern Europe and the Iberian Peninsula"
2	31	31			citation changed to (Rohde et al., 2013a)
2	31	48	31	49	citation changed to (Rohde et al., 2013b)
2	33	5			replace "Rohde et al. (2012)" with " Rohde et al. (2012) and Wild et al. (2007)" to read " Rohde et al. (2012) and Wild et al. (2007) note an apparent reversal since the mid-1980s".
2	33	10			citation changed to (Rohde et al., 2013b)
2	33	11	33	12	change '1950–2012' to '1951–2012'
2	35	18			delete "Pacific" to read "...ENSO and decadal variability patterns…"
2	35	36			Other quotations are single quotes so this should be 'bucket corrections' here
2	36	25	36	26	replace phrase "but change from platform to platform in a random fashion." with "while measurement errors from different platforms remain independent."
2	37				Table 2.6, column 2, row 4: insert a dash [cell should not be empty; dash needed for consistency with caption]
2	38	13	38	13	Insert " at the Earth's surface" after "warmer"
2	38	13	38	13	Replace "all" with "any"
2	38	28	38	28	Remove "(early-industrial)"
2	38	29	38	29	Insert ", and the warming from 1850-1900 to 2003-2012 (the most recent decade) is 0.78 [0.72 to 0.85] °C" after "confidence interval)"
2	39	23	39	24	Replace "apparent flattening ('hiatus') in trends" with "inobserved reduction in warming trend"
2	39	33	39	33	Add after line 33: "Trends of this short length are very sensitive to the precise period selection with trends calculated in the same manner for the 15-year periods starting in 1995, 1996, and 1997 being 0.13 [0.02 to 0.24], 0.14 [0.03 to 0.24] and 0.07 [-0.02 to 0.18] (all °C per decade), respectively."

Chapter	From Page	From Line	To Page	To Line	Edit
2	39	33	39	33	Insert "Trends of this short length are very sensitive to the precise period selection with trends calculated in the same manner for the 15-year periods starting in 1995, 1996, and 1997 being 0.13 [0.02 to 0.24], 0.14 [0.03 to 0.24] and 0.07 [-0.02 to 0.18] (all °C per decade), respectively." at the end of the paragraph.
2	39	37	39	41	Replace the paragraph that starts at "The global combined land…" and ends at "…since 1998)" with "The globally averaged combined land and ocean surface temperature data as calculated by a linear trend, show a warming of 0.85 [0.65 to 1.06] °C, over the period 1880–2012, when multiple independently produced datasets exist, and about 0.72°C (0.49°C to 0.89°C) over the period 1951–2012. The total increase between the average of the 1850–1900 period and the 2003–2012 period is 0.78 [0.72 to 0.85] °C and the total increase between the average of the 1850-1900 period and the reference period for projections 1986−2005 is 0.61 [0.55 to 0.67] °C, based on the single longest dataset available. For the longest period when calculation of regional trends is sufficiently complete (1901–2012), almost the entire globe has experienced surface warming. In addition to robust multi-decadal warming, global mean surface temperature exhibits substantial decadal and interannual variability. Owing 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. As one example, the rate of warming over the past 15 years (1998–2012; 0.05 [–0.05 to +0.15] °C per decade), which begins with a strong El Niño, is smaller than the rate calculated since 1951 (1951–2012; 0.12 [0.08 to 0.14] °C per decade). Trends for 15-year periods starting in 1995, 1996, and 1997 are 0.13 [0.02 to 0.24], 0.14 [0.03 to 0.24] and 0.07 [-0.02 to 0.18], respectively."
2	45	24	45	25	Replace "the GHCN and GPCC data sets show statistically significant but opposite trends in" with "all datasets exhibit increases in"
2	45	25	45	26	Replace "with the Smith et al. and CRU data sets showing small non-significant declines" with "three of the four showing statistically significant changes"
2	45	26	45	26	Insert "However, there is a factor of almost three spread in the magnitude of the change which serves to create low confidence. " before "Global trends…"
2	45	27	45	27	Replace "three" with "four"
2	45	28	45	28	Delete ", particularly for the early part of the 20th century"
2	45	28	45	28	Insert " with the infilled Smith et al. (2012) analysis showing increases and the remainder decreases" after "...datasets"
2	45	29	45	29	Insert " in part" after "owing"
2	45	44	45	44	Replace "little" with "less"
2	45	50	45	50	Insert " in any of the datasets" after "…precipitation"
2	46	4	46	4	Replace "two" with "three"
2	46	5	46	5	Replace "the GHCN dataset shows a significant increase" with "where data completeness permits trend calculations solely"
2	46	5	46	6	Replace "whereas the other three datasets show no significant change" with "all datasets show increases but there is a wide range of magnitudes and the infilled Smith et al. series shows small and insignificant trends"
2	46	7	46	7	Delete "Because of insufficient data, longer trends for the high latitudes are not available"
2	46	7	46	7	Insert" and yield low confidence in resulting zonal band average estimates" after "less certain"
2	46	8	46	8	Insert "limited" before "evidence"
2	46	9	46	9	Insert " but GHCN having negative trends that are not significant" after "1901-2008 period"
2	46	10	46	10	Insert ", two showing non-significant drying trends and the final dataset suggesting increases in precipitation" after "towards drying"
2	46	12	46	12	Insert "broadly " before "consistent"
2	46	15	46	16	Delete "which both show that precipitation has increased over wet regions of the tropics and NH mid-latitudes, and decreased over dry regions of the subtropics"
2	46	19	46	22	The numbers in tables 2.11 and 2.12 for several data sets were in error because a change in the data input format provided by the CA was not noticed when the trends were intially computed. These numbers have been corrected in the final document necessitating a change in much of the relevant section text. Although the summary assessment (confidence and likelihood) was the same it was felt necessary to rewrite this for clarity given the changes in the underlying tables and text discussion.
2	46	30	46	30	Change "1979" to "1951"
2	46	36	46	36	Insert " but are far more limited than for temperature over a similar length period (cf. Figure 2.21)" after "data set"

Chapter	From Page	From Line	To Page	To Line	Edit
2	46	37	47	1	Replace "many of the areas that showed statistically significant long-term trends in AR4" with "most areas for which trends can be calculated for both periods"
2	47	1	47	1	Replace "opposite" with "similar"
2	47	2	47	2	Change "1979" to "1951"
2	47	2	47	2	Insert "with few exceptions" after "2010 period"
2	47	2	47	2	The content of the brackets now reads: "e.g., South Eastern Australia"
2	47	3	47	5	Replace "The prominent exception is the Sahel region which for 1979–2010 continues to show an increase, although not as strong as reported in AR4." with "Trends over shorter periods can differ from those implied for the longest periods. For example, since the late 1980s trends in the Sahel region have been significantly positive (not shown)."
2	47	8	47	8	Insert "annual" before "precipitation"
2	47	9	47	9	Change "1979" to "1951"
2	47	14	47	22	Replace paragraph with "In summary, when averaged over the land areas of the mid-latitudes of the NH, all datasets show a likely overall increase in precipitation (medium confidence since 1901, but high confidence after 1951). For all other zones one or more of data sparsity, quality, or a lack of quantitative agreement amongst available estimates yields low confidence in characterisation of such long-term trends in zonally averaged precipitation. Nevertheless, changes in some more regional or shorter-term recent changes can be quantified. It is likely there was an abrupt decline in SH mid-latitude precipitation in the early 2000s consistent with enhanced drying that has very recently recovered. Precipitation in the tropical land areas has increased (medium confidence) over the last decade, reversing the drying trend that occurred from the mid-1970s to mid-1990s reported in AR4."
2	49	52	49	53	Delete '(Table 2.11)' and revise text to "in the tropics and in the extratropics during summer over both land and ocean."
2	56	49	56	50	Remove Central America from “Regional trends in precipitation extremes since the middle of the 20th century are varied (Table 2.13). In most continents confidence in trends is not higher than medium except in North America and Central America and Europe where there have been likely increases in either the frequency or intensity of heavy precipitation." as it is not a continent.
2	57	12			replace 'waiting' with 'return'
2	63	5	63	5	Updated figure references for TX10p, TX90p, SDII, R95p
2	63				Box 2.4, Table 1: delete "(99th)"
2	68				Caption Fig 2.38: text of (d) should be swapped with (g), (e) with (h), and (f) with (i).
2	69	16			"zonal mean wind trends" -> zonal mean zonal wind trends"
2	71	56	71	56	Insert "(high confidence)" after "1990s"
2	76	10			Change 'east-intensified warming in the Tropical Atlantic' to 'intensified warming in the eastern Tropical Atlantic'
2	76	18	76	20	Replace "The increase in the NAO index from the 1950s to the 1990s has reversed in more recent periods so that confidence in long-term trends is low." with "Confidence is high that the increase in the North Atlantic Oscillation (NAO) index from the 1950s to the 1990s has been largely offset by recent changes."
2	121				Revised Figure 2.6
2	137				Revised Figure 2.21
2	147				Figure 2.29 updated to include trends from 1951 to 2010 instead of 1979 to 2010.
2	157				Revised Figure 2.36
2	158				Revised Figure 2.37
2	161				Revised Figure 2.39
2	163				Revised Box 2.5, Figure 2

Chapter	From Page	From Line	To Page	To Line	Edit
2	SM				Figure 2.SM.4 added corresponding to Figure 2.29 as a consequence to a SPM trickleback.

Chapter 3: Observations: Ocean

Chapter	From Page	From Line	To Page	To Line	Edit
3	3	8	3	8	Reference for sea surface temperature changed to section 2.4.2, not section 2.2.2
3	3	11	3	11	change ">0.1°C per decade" to "0.11 [0.09 to 0.013] °C per decade"
3	3	14	3	15	Changed "mitigated" to "reduced" and "reducing" to "diminishing". The complete sentence should now read: "Instrumental biases in historical upper ocean temperature measurements have been identified and reduced since AR4, diminishing artificial decadal variation in temperature and upper ocean heat content, most prominent during the 1970s and 1980s."
3	3	18	3	18	Change "1957 to 2010" to "1957 to 2009" to match P3L34, P10L41, & P11L423
3	3	21	3	23	Changed this sentence to read: "Below 3000 m depth, the largest warming is observed in the Southern Ocean. [3.2.4, 3.5.1, Figure 3.2b, Figure 3.3, FAQ 3.1]."
3	3	26	3	29	Changed to: "Published rates for that time period range from 74 TW to 137 TW, with generally smaller trends for estimates that assume zero anomalies in regions with sparse data. Using a statistical analysis of ocean variability to estimate change in sparsely sampled areas and to estimate uncertainties results in a rate of increase of global upper ocean heat content of 137 [120–154] TW (*medium confidence**)***.
3	3	40	3	40	Changed "between 1971 and 2010 with" to "between 1971 and 2010 (*high confidence*) with".
3	4	11	4	11	Added section 3.3.5 to brackets, so it now reads "[3.3.2, 3.3.3, 3.3.5, Figures 3.4, 3.5 and 3.21d, FAQ3.3]."
3	5	5	5	6	Text revised to read: “However, 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. [3.6, Figures 3.10, 3.11].”
3	5	27	4	28	Deleted sentence from Executive Summary "There is high confidence that the rate has to be between 1 and 2 mm/year because it is measured by two independent systems (GRACE and steric-corrected altimetry) at that level. See also Figure 3.13d."
3	5	54	5	54	Changed sentence to: "Uptake of anthropogenic CO2 results in gradual acidification of the ocean."
3	5	55			Insert "surface" before "seawater"
3	5	56	5	56	Insert "*(high confidence)*" after "concentration"
3	7	7	7	7	replaced "one quarter" with "about 30%"
3	8	26	8	31	Text revised to replace "mitigate" with "reduce": "Careful comparison of measurements from the less accurate instruments with those from the more accurate ones has allowed some of the biases to be identified and reduced (Wijffels et al., 2008; Ishii and Kimoto, 2009; Levitus et al., 2009; Gouretski and Reseghetti, 2010; Hamon et al., 2012). One major consequence of this bias reduction has been the diminishment of an artificial decadal variation in upper ocean heat content that was apparent in the observational assessment for AR4, in notable contrast to climate model output (Domingues et al., 2008)."
3	8	28	8	28	Changed "mitigated" to "reduced"
3	8	29	8	29	Changed "mitigation" to "reduction" and changed "reduction" to "diminishment"
3	9	17	9	17	Replace "exceeds" with "is" and "0.1" with "0.11 [0.09 to 0.13]"
3	10	39			replace “ocean is warming” by “ocean warmed”
3	10	42	10	42	Inserted the word "likely": "…from 700–2000 m *likely* continues…"
3	10	55	10	56	Changed to: “Based on the limited information available, it is *likely* that the global ocean did not show a significant temperature trend between 2000 and 3000 m depth from circa 1992–2005 [3.2.4; Figures 3.2b and 3.3a].”
3	11	38	12	38	Delete "about" and replace "0.1" with "0.11 [0.09 to 0.13]"
3	11	39			replace “increases” with “increased”
3	11	48	11	49	Replace "For the deep ocean, sparse sampling, currently below 2000 m, is the greatest source of uncertainty" with "Sparse sampling is the largest source of uncertainty below 2000 m depth."
3	12	8	12	8	Changed "than the deep ocean" to "than the mid-depth and deep ocean" (to be consistent with Section 3.2 and Fig. 3.2)

Chapter	From Page	From Line	To Page	To Line	Edit
3	12	51	12	51	New sentence added before the sentence starting "Ocean warming dominates …": "An energy gain of 274 ZJ is equivalent to an heating rate of 0.42 W m^-2 applied continuously over the surface area of the earth (5.10 x 10^14 m^2)."
3	12	52	12	52	Added "The upper (0-700 m) ocean accounts for about 64% of the total energy change inventory." immediately prior to "Melting ice" on P12L52 in Box 3.1.
3	12	52	12	52	Insert "*(high confidence)*" after "(1971-2000)"
3	12	53	12	53	Insert "The upper (0-700 m) ocean accounts for about 64% of the total energy change inventory." immediately prior to "Melting ice" on P12L52.
3	12	56	12	56	Insert "(3.60 x 10^14 m^2)" after "global ocean surface area"
3	12	58	12	58	Insert " over the global ocean surface area" after "0.71 W m^-2".
3	14	45			Replace "A significant freshening in the Southern Ocean south of 50°S is observed globally." with "A significant freshening is observed in the circumpolar Southern Ocean south of 50S."
3	17	35	17	35	Insert "While similar conclusions were reached in AR4, the recent studies summarized here, based on expanded data sets and new analysis approaches, provide *high confidence* in the assessment of trends in ocean salinity." before "It is virtually certain that the salinity..."
3	19	45	19	46	Remove "(the exception being moored buoy observations in the tropical band 15°S to 15°N since the 1990s"
3	20	54			Put "Confidence" in italic
3	21	9	21	9	Reference to section 2.7.8, not 2.6.8
3	21	32	21	32	Replace "strengthening of the" with "a stronger Walker"
3	22	10	22	12	Reference list revised: 'Model hindcasts based on 20CRv2 (spanning 1871–2010) and ERA40 (spanning 1958–2001) show increases in annual and winter mean SWH in the north-east Atlantic, although the trend magnitudes depend on the reanalysis products used (Wang et al., 2009; Semedo et al., 2011; Wang et al., 2012).' to 'Model hindcasts based on 20CRv2 (spanning 1871–2010) and ERA40 (spanning 1958–2001) show increases in annual and winter mean SWH in the north-east Atlantic, although the trend magnitudes depend on the reanalysis products used (Sterl and Caires, 2005; Wang et al., 2009; Semedo et al., 2011; Wang et al., 2012).'
3	22	12	22	16	Reference list revised: 'Analysis of VOS observations for 1958–2002 reveals increases in winter mean SWH over much of the North Atlantic, north of 45°N, and the central to eastern midlatitude North Pacific with typical trends of up to 20 cm per decade (Sterl and Caires, 2005; Gulev and Grigorieva, 2006; Wang and Swail, 2006; Wang et al., 2009; Wang et al., 2012).' to 'Analysis of VOS observations for 1958–2002 reveals increases in winter mean SWH over much of the North Atlantic, north of 45°N, and the central to eastern midlatitude North Pacific with typical trends of up to 20 cm per decade (Gulev and Grigorieva, 2006).'
3	25	52	26	4	Revised caption to Figure 3.9: "Upper 2000 dbar zonally-averaged linear trend (1950 to 2000) (colours with white contours) of salinity changes (column 1, PSS-78 per 50 yr), neutral density changes (column 2, kg m-3 per 50 yr), and potential temperature changes (column 3, °C per 50 yr), for the Atlantic Ocean (ATL) in row 1, Indian Ocean (IND), row 2, Pacific Ocean (PAC), row 3, and global ocean (GLO) in row 4. Mean fields are shown as black lines (Salinity: thick black contours 0.5 PSS-78, thin contours 0.25 PSS-78; Neutral density: thick black contours 1.0 kg m-3, thin contours 0.25 kg m-3; Potential temperature: thick black contours 5.0°C, thin contours 2.5°C). Trends are calculated on pressure surfaces (1 dbar pressure is approximately equal to 1 m in depth). Regions where the resolved linear trend is not significant at the 90% confidence level are stippled in grey. Salinity results are republished from Durack and Wijffels (2010) with the unpublished temperature and density results from that study also presented."
3	28	36			Put "very likely" in italic
3	30	56	30	56	Additional text added to end of this sentence, so line 56 now reads "…salinity and sea surface height indicate the current system has shifted poleward between 1950 and 2010 (*medium confidence*)."
3	31	35	31	35	Sub-section reference changed: "4.3.4" to "4.3.3.4"
3	37	14	37	15	Revised caption: "Black dots indicate trends are not significant at the 95% confidence level" should be replaced with "Only trends significant at the 95% confidence level are shown."
3	38	2	38	2	Replaced 25% with 30%
3	40	55	41	1	Remove "A global mean decrease in surface water pH of 0.08 from 1765 to 1994 was calculated based on the inventory of anthropogenic CO2 (Sabine et al., 2004), with the largest reduction (–0.10) in the northern North Atlantic and the smallest reduction (–0.05) in the subtropical South Pacific. These regional variations

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					in the size of the pH decrease are consistent with the generally lower buffer capacities of the high latitude oceans compared to lower latitudes (Egleston et al., 2010)."
3	41	3	41	5	Remove "Over longer time periods, anthropogenic changes in ocean chemistry are expected to become increasingly prominent relative to changes imparted by physical and biological variability."
3	41	7	41	8	Replace the sentence with these two sentences: "Based on the consistency of these observations, the pH of surface waters has decreased as result of ocean uptake of anthropogenic CO2 from the atmosphere. There is high confidence that the pH decreased by 0.1 since the preindustrial era."
3	42	25			delete “changes” and replace “have” with “has”. Sentence reads: “Dissolved oxygen in the ocean thermocline has generally decreased …”
3	43	49			Replace the sentence "It is very likely that oceanic uptake of anthropogenic CO2 results in gradual acidification of the ocean." with "Oceanic uptake of anthropogenic CO2 results in gradual acidification of the ocean."
3	45	58	45	58	Changed "upper 60 m" to "upper 75 m".
3	46	1	46	1	Replace "around 0.1" with "0.11 [0.09 to 0.13]"
3	47	12	47	12	Replaced 25% with 30%
3	47	28			Replace "565" with "555"

Chapter 4: Observations: Cryosphere

Chapter	From Page	From Line	To Page	To Line	Edit
4	3	27			Remove "sea ice area at" to avoid confusion between "area" and "extent"
4	3	28			Insert "(that has survived two or more summers) " to define multi-year ice
4	4	12	4	12	Replace text "During the last decade," with "Between 2003 and 2009, "
4	4	37	4	37	Delete "that", to give ",and both components have increased"
4	4	51	4	52	Change "low confidence" to "medium confidence"
4	5	39	5	44	Replace current ES statement with: "In many regions, the depth of seasonally frozen ground has changed in recent decades (*high confidence*). In many areas since the 1990s, active layer thicknesses increased by a few centimetres to tens of centimetres (*medium confidence*). In other areas, especially in northern North America, there were large inter-annual variations but few significant trends (*high confidence*). The thickness of the seasonally frozen ground in some non-permafrost parts of the Eurasian continent likely decreased, in places by more than 30 cm from 1930 to 2000 (*high confidence*)."
4	6	2			Replace "50% snow extent" with "50% contour for frequency of snow occurrence"
4	6	5			Insert ", ice shelves" after "ice sheets"
4	9	5			Move citations to end of sentence, to make their signficance correct
4	10	37			Replace "era" with "record"
4	10	40			Change "Fauria" to "Macias Fauria"
4	10	42			Insert "(see 5.5.2)" to read "1450 years (see 5.5.2)"
4	12	4			Insert "Uncertainties in the observations (very likely range) are indicated by representative error bars, and uncertainties in the trends are given (very likely range)." at the end of caption
4	12				Caption Fig. 4.4: Move "(updated from Comiso, 2012)" to after "microwave data"
4	14	1			Replace "Figure 4.6e" with "Figure 4.6d"
4	14	41	14	41	Also, change "There has been a 3-month" to "This 3-month"
4	14	53	14	53	Replace "30 years" with "34 years, (1979-2012)" Replace "has increased" with "has likely increased"
4	15	38	15	42	Change to read: "The data set is robust with continuous and consistent global coverage on a daily basis thereby providing very reliable trend results (*very high confidence*). The annual Arctic sea ice cover *very likely* declined within the range 3.5 to 4.1% per decade (0.45 to 0.51 million km^2 per decade) during the period 1979–2012 with larger changes occurring in summer and autumn (very h*igh confidence*). Much larger changes applies to the perennial ice (the summer minimum extent) which *very likely* decreased in the range from 9.4 % to 13.6 % per decade (0.73 to 1.07 million km^2 per decade) and multiyear sea ice (more than 2 years old) which *very likely* declined in the range from 11.0 % to 16.0% per decade (*very high confidence;* Figure 4.6b and Figure 4.4). "
4	15	43			Move "(Figure 4.6a)" to behind "extent" in the same sentence. Also, it becomes "(Figure 4.6b)".
4	15	47	15	48	Change "which decreased by 1.75 m to 1.89 m during 2009" to "which *likely* decreased by 1.8 [1.3 to 2.3] m by 2008 (*High Confidence*, Figure 4.6c)"
4	15	48	15	49	Incorrect use of double negative in trends. Remove negative signs in "-0.08", "-0.10/-0.20"
4	15	52	15	52	Replace “2003-2008.” with “2003-2008 (medium confidence)”
4	16	49			Add text after "per decade" to read "per decade (0.13 to 0.20 million km^2 per decade)" and move "updated from Comiso and Nishio (2008)" to after "December 2012"
4	17	34			Replace "a" with "an increase in"
4	18	33	18	38	Replace three sentences starting from "There has been a small....decrease over the satellite period." with

Chapter	From Page	From Line	To Page	To Line	Edit
					"There has been a small but significant increase in total ice extent that is *very likely* in the range of 1.2 to 1.8 % per decade between 1979 and 2012 (very *high confidence*). There was also a greater increase in ice area associated with an increase in ice concentration. But there are strong regional differences within this total, with some regions increasing in extent/area and some decreasing (*high confidence*). There are also contrasting regions around the Antarctic where the ice-free season has lengthened, and others where it has decreased over the satellite period (*high confidence*). "
4	18	57	18	57	Replace reference, "(Chapter 3, section 3.4.4)", with "(WGII Chapter, 3)" - we believe that the correct section is WGII, 3.4.4, but cannot be sure that this will not be changed in future revisions.
4	19	24	19	25	Revised sentence starting with "More than 80%..." to read "When summed up, nearly 80% of the glacier area found in regions Antarctic and Subantarctic (region 19), Canadian Arctic (regions 3 and 4), High Mountain Asia (regions 13, 14 and 15), Alaska (region 5), and Greenland (region 17) (Table 4.2)."
4	19	42	19	42	Add sentence to caption. "Due to ongoing quality improvements, the numbers from RGI 2.0 will be revised in future releases of the RGI."
4	19	43			Insert "Ongoing improvements may lead to revisions of these (RGI 2.0) numbers in future releases of the RGI" at the end of table caption.
4	19	44	19	14	Remove 10^3 in column 4, line 2. To read "Area (km^2)"
4	19	44	19	44	Change tidewater fraction (%) for Alaska 13.0 to 13.7
4	19	44	19	44	Change tidewater fraction (%) for Arctic Canada North from 45.7 to 46.5
4	19	44	19	44	Change tidewater fraction (%) for Arctic Canada South 7.5 to 7.3
4	19	44	19	44	Change tidewater fraction (%) for Greenland from 35.5 to 34.9
4	19	44	19	44	Change tidewater fraction (%) for Russian Arctic from 0 to 64.7
4	19	44	19	44	Change tidewater fraction (%) for Svalbard 6.5 to 43.8
4	20	10	20	10	In caption to figure 4.8, line 10, change "green" to "blue"
4	20	17			Replace "and" with "at about a hundred glaciers"
4	20	17			Replace "some" with "a few"
4	20	31			Insert "over the past decades" after "changes"
4	20	"0"	20	"0"	Change tidewater fraction (%) for Antarctic and Subantarctic from 99.0 to 97.8
4	20	"0"	20	"0"	Change tidewater fraction (%) for Southern Andes from 19.0 to 23.8
4	20	"0"	20	"0"	Insert tidewater fraction (%) for Total as 38.5
4	21	15			Replace "slightly more than 100" with "about 100 glaciers being measured"
4	21	17			Change "Zemp et al., 2011" to "WGMS, 2009"
4	21	17			Insert "in the surface measurements" after "included"
4	21	23			Insert " from two points in time" after "models"
4	21	46			Add " mass" after "volume"
4	22	10			Change "11" to "14"
4	22				Table 4.3: replace ">450" with "Hundreds"
4	23	38			Change "new complete RGI inventory" to "new near complete inventory (RGI)"
4	24	15			Replace "Tibetan Plateau" with standard name - "Qinghai-Xizang (Tibet) Plateau"
4	25	42	25	42	Replace "180 000" with "170 000" - Error noted by LA

Chapter	From Page	From Line	To Page	To Line	Edit
4	30	18	1		Replace "was not produced" with "was produced" - DGV
4	33	18	33	19	Replace the sentence starting with "Results from the mass..." with “The SMB reconstructions used in the mass budget method have improved considerably since AR4 (e.g., Rignot et al. 2008b; van den Broeke et al., 2006; Lenaerts et al., 2012; Shepherd et al., 2012)."
4	34	17	34	20	Replace the sentence starting with "However, their reassessment" with "Their reassessment of total Antarctic change made a correction for the ice discharge estimates from regions of the ice sheet not observed in the mass budget method (see Section 4.4.2.1.1). The analysis of Shepherd et al. (2012) indicated that the missing regions contribute little to the total mass change. ”
4	34	22	34	24	Change "In the near-absence of surface...from the 1970s" to "In the near-absence of surface runoff and, as discussed above, with no evidence of multi-decadal change in total snowfall, there is high confidence that Antarctic multi-decadal changes in grounded ice mass must be due to increased ice discharge, although the observational record of ice G61dynamics only extends from the 1970s.
4	34	27	34	29	Revise to read "Over the last two... outlet glaciers" to read "There is *high confidence* that over the last two decades, surface mass balance has become progressively more negative as a result of an increase in melt and runoff, and that ice discharge across the grounding line has also been enhanced due to the increased speed of some outlet glaciers."
4	34	29	34	31	Replace "The three techniques.... Amundsen Sea , in West Antarctica (Figure 4.14c)" with "The three techniques are in excellent agreement as to the spatial pattern of ice loss (thinning) and gain (thickening) over Antarctica (Figure 4.14). There is very high confidence that the largest ice losses are located along the northern tip of the Antarctic Peninsula where the collapse of several ice shelves in the last two decades triggered the acceleration of outlet glaciers, and in the Amundsen Sea, in West Antarctica (Figure 4.14c, d, e, f)."
4	34	34	34	34	Replace "by a" with "and low confidence that this is due to high ocean heat flux"
4	34	35			Change to "and medium confidence that this is due to high ocean heat flux by a warm ocean (Jacobs et al., 2011)" to make explicit the assessment of confidence
4	37	39			Remove "Otero et al., 2011"
4	40	4	40	4	Change section reference from "2.3.1.3" to "2.5.1.3"
4	40	27	40	27	Add text after “through the statistical analysis of multiple datasets" to read "through the statistical analysis of multiple datasets, which leads to *very high confidence*.”
4	40	31	40	33	Change to read "Averaged March and April NH SCE decreased 0.8% [0.5–1.1%] per decade over the 1922–2012 period, 1.6% [0.8–2.4%] per decade over the 1967–2012 period, and 2.2% [1.1–3.4%] per decade over the 1979–2012 period. In a new development since AR4, both absolute and relative loss in June SCE now exceed the losses in March-April SCE: 11.7% [8.8–14.6%] per decade or 53% [40–66%] total over the 1967-2012 period, and 14.8% [10.3–19.3%] per decade over the 1979–2012 period."
4	40	33			Add text after paragraph, ""per decade over the 1979–2012 period.” to read ""per decade over the 1979–2012 period (all ranges *very likely*)”
4	40	34			Replace "in the paper" with "given by Brown and Robinson (2011) "
4	41	46			Replace "Qinghai Tibetan Plateau" with standard name
4	42	4	42	4	For captions to Figure 4.21. Add a sentence after the first sentence... Replace "that are negative)." with "that are negative) showing that most sites studied show decreases in snow, especially at lower and/or warmer locations"
4	44	49			Replace "Qinghai-Tibetan Plateau" with standard name
4	45	4	45	4	Table entry on Northern Alaska: change "2.7" to "3" Table entry on Northern Alaska: add reference Osterkamp, 2005,
4	46	23			Replace "Qinghai-Xizang (Tibet) Plateau" with standard name
4	47	12	47	12	Insert at end of paragraph, after "(Smith et al., 2009)." "Many observations across many regions have revealed trends in the thickness of the active laver (*high confidence*)."
4	47	14	47	14	Section heading "4.6.4.1" should be changed to "4.7.4.1".

Chapter	From Page	From Line	To Page	To Line	Edit
4	47	33	47	33	Change figure reference from "23a" to "4.23a" , and "23b" to "4.23b"
4	47	35	47	35	Change figure reference from "23c" to "4.23c"
4	47	36	47	37	Change "Overall, a general increase in ALT has been observed over various stations and regions (*medium confidence*)" to "Overall, a general increase in ALT since the 1990s has been observed at many stations in many regions (*medium confidence*)"
4	47	52			Replace "Qinghai-Tibetan Plateau" with standard name
4	48	5	48	5	At beginning of paragraph, before "No trend..." insert "In several areas, across North America and in west Siberia, large-inter annual variations obscure any trends (*high confidence*, Figure 4.23)"
4	48	8	48	8	Change figure reference from "Figure 23" to "Figure 4.23"
4	48	24	48	25	Change "Russia" to "parts of the Eurasian continent" Change "(Figure 4.24)" to "(*high confidence*, Figure 4.24)"
4	48	32			Replace "Tibetan Plateau" with standard name
4	48	34			Replace "Qinghai-Xizang (Tibetan) Plateau" with standard name
4	49	30			Replace "globally complete inventory of glacier outlines" with "near-complete global glacial inventory"
4	50	3	50	3	Replace "(Section 4.3.4)" with "(Section 4.3.3 and 4.4.2)"
4	50	11			Remove "Altai and Terskey Alatoo,"
4	79				Revised trend ranges in Figure 4.4 (Trickleback from SPM): 10300 becomes 17000, 9430 becomes 15600, 9200 becomes 15200, 7870 becomes 13000
4	99				Figure 4.24: Remove country borders.
4	Refs				Change reference from "Fauria…" to "Macias Fauria…"
4	Refs				Insert reference : Osterkamp, T.E., 2005: The recent warming of permafrost in Alaska. Global Planet. Change, 49, 187–202, doi: 10.1016/j.gloplacha.2005.09.001.

Chapter 5: Information from Paleoclimate Archives

Chapter	From Page	From Line	To Page	To Line	Edit
5	3	37	3	37	Replace "2°C to 3.5°C" by "1.9 to 3.6°C"
5	3	37	3	37	delete "approximately" before "1.9 to 3.6°C"
5	4	10	4	10	replace "ago) was at least 5 m higher" by "ago) was, for several thousand years, at least 5 m higher"
5	4	27	4	27	insert "High-latitude surface temperature, averaged over several thousand years, was at least 2°C warmer than present (high confidence)." before "Greater warming"; italicize "high confidence"
5	4	39	4	39	replace "There is medium confidence from reconstructions that the current (1980 to 2012) summer sea-ice retreat and increase in sea-surface temperatures in the Arctic are anomalous in the perspective of at least the last 2,000 years." by "There is medium confidence from reconstructions that the current (1980 to 2012) Arctic summer sea-ice retreat was unprecedented and sea-surface temperatures were anomalously high in the perspective of at least the last 1450 years."; italicize "medium confidence"
5	5	3	5	3	replace "intervals" by "periods"
5	5	5	5	5	replace "these intervals were not as synchronous across seasons and regions as the" by " "these regional warm periods were not as synchronous across regions as the"
5	5	29	5	29	replace "[5.4]" by "[5.4.1]"
5	5	35	5	35	replace "[5.4]" by "[5.4.2]"
5	5	40	5	40	replace "[5.4]" by "[5.4.2]"
5	5	49	5	49	change link to "[5.8.2]"
5	5	51			Put "Confidence" regular instead of italic
5	6	11	6	11	replace "remains above approximately 400 ppm" by "stays within, or above, the range of 350–450 ppm"
5	11	34			Change "grey" to "green"
5	11	38	11	39	change: "(Petit et al, 1999; Siegenthaler et al., 2005) (blue line; Lüthi et al, 2008)" to "(green line, Petit et al., 1999; Siegenthaler et al., 2005; Lüthi et al., 2008)"
5	14	34	14	36	Rephrase to: "In summary, high confidence exists for polar amplification in either one or both hemispheres, based on robust and consistent evidence from temperatures reconstructions of past climates, recent instrumental temperature records, and climate model simulations of past, present, and future climate changes." italicize "high confidence"
5	15	30	15	30	replace "industrial" by "PETM mean climate" immediately after "pre-"
5	15	42	15	42	Replace 8°C–14°C by 9°C–14°C
5	16	33	16	33	insert "(Kawamura et al., 2007; Cheng et al., 2009; Lisiecki, 2010; Huybers, 2011)" after "cycles"
5	18	48			Change "Qiuzhen et al., 2008" to "Yin et al., 2008"; also change reference accordingly
5	24	29	24	29	add "medium confidence" between "pre-industrial" and "(Turney and Jones"; italicize "medium confidence"
5	24	30	24	30	insert "High-latitude surface temperature, averaged over several thousand years, was at least 2°C warmer than present (high confidence) (Fig. 5.6)." before "In response"; italicize "high confidence"
5	24	55	24	55	Insert "In (c) and (d) JJA denotes June – July – August and DJF December – January – February, respectively." at the end of the caption
5	25	11	25	11	Replace "Table 5.A.1" by "Appendix 5.A.1"
5	25	32			Italicize "likely"
5	26	7	26	8	Table 5.4 Study 5: Domain changed from "Land" to "Land & Sea", and likelyhood changed from "very likely" to "likely" in the 50-year means of 1000-1899 and 30-year means of 800-1899, 600-1899, 400-1899, 200-1899, and from "likely" to "as likely warmer or colder than recent temperatures" for the 50-year means of 800-

Chapter	From Page	From Line	To Page	To Line	Edit
					1899, 600-1899, 400-1899, and 200-1899.
5	26	11			Table 5.4, Notes: italicize "likely (very likely)"
5	26	25	26	25	replace "9=LO2012" by "9=LO12glac"
5	28	39	28	39	replace "Figure 10.18" by "Figure 10.19"
5	29	12	29	12	replace "Section 10.7.2.2" by "Section 10.7.2"
5	31	5	31	5	change to: "...amplitude throughout the last 7 ka (high confidence), which is consistent with the weak reduction in mid-Holocene ENSO amplitude of only 10% simulated by the majority of climate models (Fig. 5.10), but contrasts with reconstructions reported in AR4 that showed a reduction in ENSO variance during the first half of the Holocene. The same study revealed an ENSO system..."; italicize "high confidence"
5	32	1	32	1	remove "with medium confidence"
5	32	2	32	2	insert "for the last 400 years" between "evidence" and "(e.g., Lara et al., 2008)"
5	32	3	32	3	remove "studies" after "(Wilmens et al., 2012)"
5	32	3	32	3	add "Hence, there is medium confidence that the positive trend in SAM since 1950 may be anomalous compared to the last 400 years." after "(Wilmens et al., 2012)."; italicize "medium confidence"
5	33	19			"entered" --> "centered"
5	34	33	34	34	After "For comparison with instrumental record, the CRUTEM4 dataset is shown (yellow line)." insert: "These instrumental data are not necessarily those used in calibration of the reconstructions, and thus may show greater or lesser correspondence with the reconstructions than the instrumental data actually used for calibration; cutoff timing may also lead to end effects for the smoothed data shown. Cf. PAGES 2k Consortium (2013, SOM) in this regard for the North America reconstruction."
5	34	44	34	44	Insert "Time periods for averaging are JJA for June – July – August, SONDJF for the months from September to February, and DJF for December – January – February, respectively, while ANN denotes annual mean." at the end of the caption
5	35	14	35	14	updated "2012" to "2013" in Bostock et al. Reference
5	35	48	35	48	replace "intervals" by "periods"
5	35	49	35	49	replace "These intervals were not as synchronous across seasons and regions" by "These regional warm periods were not as synchronous across regions"
5	36	14	36	14	replace "There is medium confidence that the current ice loss and increasing SSTs in the Arctic are anomalous at least in the context of the last two millennia" by "There is medium confidence that the current ice loss was unprecedented and that current SSTs in the Arctic were anomalously high at least in the context of the last 1450 years"; italicize "medium confidence"
5	37	4	37	4	insert "with high confidence" between "attributed" and "to high summer insolation"; italicize "high confidence"
5	37	6	37	6	insert "(medium confidence)" between "6 ka" and "(e.g., Anderson"; italicize "medium confidence"
5	38	30	38	30	Delete "Return" at beginning of the sentence "Return intervals for droughts […]."
5	38	30	38	30	Replace "for" by "between" between "Intervals" and "droughts"
5	38	33	38	33	Replace "No range is given if there is only a single observation of a drought of that duration." by "No error bars are present if there are fewer than three observations of a drought of that duration."
5	41	10	41	10	replace "was at least 5 m higher" by "was, for several thousand years, at least 5 m higher"
5	42	35	42	35	add: ", implying with medium confidence a contribution from the Antarctic ice sheet." after "...sea level equivalent"; italicize "medium confidence"
5	42	51	42	51	replace "assessment" by "quantification"
5	44	16	44	16	replace "both the NH and SH is an acceleration, late in" by "both the NH and SH is an increase in rate (high confidence), late in"; italicize "high confidence"

Chapter	From Page	From Line	To Page	To Line	Edit
5	44	24	44	24	add "(medium confidence)" after the call to Fig. 5.17; italicize "medium confidence"
5	44	24			Insert "(high confidence)" after "1900"
5	44	31	44	31	replace "Christmas Islands (Pacific Ocean)" by "Kiritimati (Christmas Island; Pacific Ocean)"
5	47	50	47	50	Add: "In summary, multiple lines of evidence indicate with high confidence, that the interglacial mode of the AMOC can recover from a short-term freshwater input into the subpolar North Atlantic."; italicize "high confidence"
5	48	23			Caption Figure 5.18: replace "green" with "yellow"
5	48	39			Italicize "virtually certain"
5	50	39			Italicze "high confidence"
5	65	52	65	53	ref titel changed from "Southwest Pacific marine temperature variation from late Paleocene to middle Eocene: Revisited" to "Early Paleogene temperature history of the Southwestern Pacific Ocean: reconciling proxies and models"
5	66	2	66	2	Journal titel added to ref "Journal of Foraminiferal Research, Special publication"
5	66	24	66	24	Between the two references “Hurtt et al., 2006” and “Israelson and Wohlfarth, 1999” insert “Huybers, P., 2011: Combined obliquity and precession pacing of late Pleistocene deglaciations. Nature, 480, 229-232.” Formating: Italicize "Nature", bold type "480", 0.5 in left hanging indent
5	67	33	67	33	Between the two references “Kaufman et al., 2006” and “Kemp et al., 2011” insert “Kawamura, K., et al., 2007: Northern Hemisphere forcing of climatic cycles in Antarctica over the past 360,000 years. Nature, 448, 912-916.” Formating: Italicize "Nature", bold type "448", 0.5 in left hanging indent
5	70	57	70	57	Between the two references “Linsley et al., 2008” and “Lisieki and Raymo, 2005” insert “Lisiecki, L. E., 2010: Links between eccentricity forcing and the 100,000-year glacial cycle. Nature Geoscience, 3, 349-352.” Formating: Italicize "Nature Geoscience", bold type "3", 0.5 in left hanging indent
5	71	50	71	51	Delete Reference: Lunt et al., 2012, On the cause of mid-Pliocene warmth and polar amplification. EPSL 321-322, 128-138.
5	71	51	71	51	Insert: "Lunt, D.J., Dunkleay Jones, T. Heinemann, M, Huber, M., LeGrande, A., Winguth, A., Lopston, C., Marotzke, J., Roberts, C. D., Tindall, J., Valdes, P.. And Winguth, C., 2012: A model-data comparison for a multi-model ensemble of early Eocene atmosphere-ocean simulations: EoMIP. Climate of the Past, 8, 1717-1736." Formating: Italicize "Climate of the Past", bold type "8", 0.5 in left hanging indent
5	75	58	75	59	ref titel changed in final published version from "How well do models reproduce Last Interglacial warmth? New model-data comparisons." to "How warm was the last interglacial? New model-data comparisons"
5	76	59	76	60	ref titel changed in final published version from "Concepts and application to the climate of Australasia over the past 1500 years" to "Palaeoclimate data-model comparison and the role of climate forcings over the past 1500 years"
5	90				Table 5.1: Last Millennium, last col.,: “10” should be “9, 10”
5	92	11	92	11	Table 5.A.1: CSIRO-MK3L-1-2 model supercript for "O" forcing in 1-2001 and 501-2001 runs changed from "70" to "60"
5	92				Table 5.A.1: in row IPSL-CM5A-LR change “V^{24}” to “V^{27}”
5	93				Insert "[27] Ammann et al. (2007)" on a new line in between line 20 and line 21
5	99				Table 5.A.4: replace paragraph starting with "AR5: Large-scale reconstructions…" with "For the last glacial termination, a large-scale temperature reconstruction (Shakun et al., 2012) documents that temperature change in the SH lead NH temperature change. This lead can be explained by the bipolar thermal seesaw concept (Stocker and Johnsen, 2003) (see also Section 5.7) and the related changes in the inter-hemispheric ocean heat transport, caused by weakening of the Atlantic Ocean meridional overturning circulation (AMOC) during the last glacial termination (Ganopolski and Roche, 2009). SH warming prior to NH warming can also be explained by the fast sea ice response to changes in austral spring insolation (Stott et al., 2007; Timmermann et al., 2009). According to these mechanisms, SH temperature lead over the NH is fully consistent with the NH orbital forcing of deglacial ice volume changes (high confidence) and the importance of the climate–carbon cycle feedbacks in glacial–interglacial transitions. The tight coupling is further highlighted by the near-zero lag between the deglacial rise in CO2 and averaged deglacial Antarctic temperature recently reported from improved estimates of gas-ice age differences (Pedro et al., 2012; Parrenin et al., 2013). Previous studies (Monnin et al., 2001) suggesting a temperature lead of 800 ± 600 years over the deglacial CO2 rise probably overestimated gas-ice age differences." Italicize "(high confidence)".
5	104	2	104	2	Table 5.A.6: revised Region for Loehle and McCulloch (2008) [LM08ave] reconstruction. Changed region from "L" to " L+S mostly 0°–90°N".

Chapter	From Page	From Line	To Page	To Line	Edit
5	104				Change superscript "3" after "Multi-proxy network" to "c"
5	107	1	107	1	replace fig 5.1 by version uploaded via ftp (correction in panel d; white line at 510 years was misplaced)
5	110				Revised Box 5.1, Figure 1
5	117	1	117	1	replace fi. 5.7 by version "ar5_fig5.7_10oct2013.ps" sent on 10 October 2013 (line colour changed for red to dark blue for LM08ave
5	118				Revised Figure 5.8
5	123	1	123	1	replace fig 5.11 by version uploaded via ftp (version w/o political borders)
5	125				Revised Figure 5.12
5	127		127		replace figure file by updated figure file: Fig5-13_rev.eps (version as of 30 July 2013)
5	128	5	128	5	Delete "Return" at beginning of the sentence "Return intervals for droughts […]."
5	128	5	128	5	Replace "for" by "between" between "Intervals" and "droughts"
5	128	8	128	8	Replace "No range is given if there is only a single observation of a drought of that duration." by "No error bars are present if there are fewer than three observations of a drought of that duration."

Chapter 6: Carbon and Other Biogeochemical Cycles

Chapter	From Page	From Line	To Page	To Line	Edit
6	3	27	3	28	"545 ± 85 PgC " replaced with "555 ± 85 PgC, and "365 ± 30 PgC " replaced with "375 ± 30 PgC"
6	3	37			Change "150 ± 90 PgC" to "160 ± 90 PgC"
6	4	5			Change"...the early 1990's" to "late 1990's"
6	4	18			Remove "emissions"
6	4	24			Insert "nitrogenous" before "fertilizers"
6	4	46			Change "4000 years ago" to "5000 years ago"
6	5	27	5	33	Replace the paragraph with: "Taking climate and carbon cycle feedbacks into account, we can quantify the fossil fuel emissions compatible with the RCPs. Between 2012 and 2100, the RCP2.6, RCP4.5, RCP6.0, and RCP8.5 scenarios imply cumulative compatible fossil fuel emissions of 270 (140 to 410) PgC, 780 (595 to 1005) PgC, 1060 (840 to 1250) PgC and 1685 (1415 to 1910) PgC respectively (values quoted to nearest 5 PgC, range derived from CMIP5 model results). For RCP2.6, an average 50% (range 14 to 96%) emission reduction is required by 2050 relative to 1990 levels. By the end of the 21st century, about half of the models infer emissions slightly above zero, while the other half infer a net removal of CO_2 from the atmosphere."
6	5	38			Change cross reference from 6.4.3 to 6.4.3.4
6	5	48			Italicize "likely"
6	6	29	6	33	Replace the paragraph with: "The removal of human-emitted CO2 from the atmosphere by natural processes will take a few hundred thousand years (high confidence). Depending on the RCP scenario considered, about 15 to 40% of emitted CO2 will remain in the atmosphere longer than 1,000 years. This very long time required by sinks to remove anthropogenic CO2 makes climate change caused by elevated CO2 irreversible on human time scale. {Box 6.1}" -- to make it consistent with SPM.
6	6	51			Change cross reference to read: "{6.5.3, 6.5.4, 7.7, Tables 6.14 and 6.15}"
6	7	18			Replace "trace" with "greenhouse"
6	8	49			It should read: "(~1700 PgC; Tarnocai et al., 2009); albeit some overlap with these two quantities."
6	8	58			Change "0.8" to "0.9"
6	9	19			Insert "(Denman et al., 2007)" at end of sentence.
6	9	32	9	33	The sentence revised: "…increasing atmospheric CO2 content. The removal of all the human-emitted CO2 from the atmosphere by natural processes will take a few hundred thousand years (high confidence) as shown by the timescales of the removal process shown in the table below (Archer and Brovkin, 2008). For instance, an extremely long atmospheric CO2..."
6	9	36			New sentence added immediately after (McInerney and Wing, 2011). "Based on the amount of CO2 remaining in the atmosphere after a pulse of emissions (data from Joos et al. 2013) and on the magnitude of the historical and future emissions for each RCP scenario, we assessed that about 15 to 40% of CO2 emitted until 2100 will remain in the atmosphere longer than 1000 years." -- to trace bullet points in the ES.
6	10	2			Delete "expected to be"
6	10	48			Replace "ruminants" with "ruminant livestock"
6	11	7			Change the conversion factor from "2.75 TgCH4/ppb" to"2.7476 TgCH4 per ppb"
6	11	17			Put "in estimates" regular instead of italic
6	11	32			"365 ± 30 PgC" replaced with correct quantity of "375 ± 30 PgC "
6	12	22			Remove "in the northern (solid lines) and the southern (dashed lines) hemisphere"
6	12	56			Change "Table 6.8" to "Table 6.9"
6	13	35			Change cross reference to read: (see Sections 6.1.3 and 6.3.4)

Chapter	From Page	From Line	To Page	To Line	Edit
6	15	40			replace "likely" with "probably"
6	15	42	15	44	Replace the sentence with: "In addition, past archives of GHGs also show with very high confidence that the average rates of increase of CO2, CH4 and N2O are larger during the Industrial Era (see Section 6.3) than during any comparable period of at least the past 22,000 years (Joos and Spahni, 2008)." -> to add the confidence statement, and correct time period.
6	16	40			Remove "likely"
6	17	35			Remove "likely"
6	17	37			Remove "are likely to be"
6	17	53	17	54	Italicizes "high confidence", "medium confidence", and "low confidence"
6	18	13			Italicize "unlikely"
6	18	28			Change cross reference to read: (see Section 5.7)
6	19	16			Change cross reference from (see Chapter 5, Section 5.2.2) to (see Section 5.2.2)
6	19	32			Italicize "very likely"
6	20	39			New sentence added before the sentence starting: "The mechanisms...": "Consequently, about *as likely as not*, the atmospheric CH4 increase after 5000 years ago can be attributed to early human activities."
6	21	46			"365 ± 30 PgC" has been replaced with correct quantity of "375 ± 30 PgC"
6	22				same as above in Table 6.1 for "Fossil fuel combustion and cement production"
6	22	32			Change "1960" to "1959"
6	22	34			Change "1960" to "1959"
6	22	34			New text added. The complete sentence now reads: "The residual land sink (term in green in the figure) is computed from the residual of the other terms, and represents the sink of anthropogenic CO2 in natural land ecosystems."
6	22	41			"545 ± 85 PgC" replaced with correct quantity of "555 ± 85 PgC "
6	22	46			150 ± 90 PgC replaced with correct quantity of "160 ± 90 PgC "
6	22	50			Italicize "likely"
6	22				Replace "Residual terrestrial flux" with "Residual land sink", and its quantity of "–150 ± 90" to be replaced with correct quantity of "–160 ± 90f"
6	22				Table 6.1, row 'net land use change', column '1990-1999': change "1.6" to "1.5" and "2.7" to "2.6"
6	23	5			Replace "terrestrial" with "land"
6	23	27			Unitalicize the "to" in between "medium" and "high"
6	25				Table 6.2, column 'Houghton et al. (2012)': change "1.6" to "1.5"
6	25				Table 6.2: replace all "Meiyappan and Jain (2012)" with "Yang et al. (2010)"; also remove "Meiyappan and Jain (2012)" from reference list; add "Yang et al. (2010)" to reference list
6	26	43			A new sentence added to the caption (Figure 6.10), right after (Table 6.2): "The grey shading shows a constant uncertainty of +/-0.8 PgC yr-1 around the mean estimate used in Table 6.3."
6	27				Table 6.3: replace all "Jain et al. (2013)" with "Yang et al. (2010)"; also remove "Jain et al. (2013)" from reference list
6	27				Table 6.3: replace all "Meiyappan and Jain (2012)" with "Yang et al. (2010)"
6	28	43			Text revised to replace "1986/1988" with "1986-1987"

Chapter	From Page	From Line	To Page	To Line	Edit
6	29	1			Remove "level of" and italicize "confidence"
6	33	50			Cross reference should read "See also Section 9.4.5"
6	34	41			Replace "terrestrial" with "land"
6	34	43			Change "2.7 to "2.6"
6	36	7			Replace "see Glossary" with "123±8 PgC yr–1, (Beer et al., 2010)"; also introduce "Beer et al. (2010)" in reference list
6	36	31			Replace "likely" with "probably"
6	36	38			Replace "terrestrial" with "land"
6	36	40			Add a new sentence to the end of the line to provide tracebility of confidence assessment given in the ES: "It is *likely* that reactive nitrogen deposition over land currently increases natural CO2 in particular in forests, but the magnitude of this effect varies between regions (Norby, 1998; Thornton et al., 2007; Bonan and Levis, 2010; Zaehle and Dalmonech, 2011)."
6	37	16			Italicize "very likely"
6	37	39			Italicize "likely"
6	38	7			Replace "terrestrial" with "land"
6	38	38	39	2	Revised caption of Figure 6.16: "The black line and gray shading represent the estimated value of the residual land sink (PgC yr–1) and its uncertainty from Table 6.1, which is calculated from the difference between emissions from fossil fuel and land use change plus emissions from net land use change, minus the atmospheric growth rate and the ocean sink. The atmosphere-to-land flux simulated by process land ecosystem models from Table 6.7 are shown in thin green, and their average in thick green. A positive atmosphere-to-land flux represents a sink of CO2. The definition of the atmosphere-to-land flux simulated by these models is close to but not identical to the residual land sink from Table 6.1 (see Table 6.7)."
6	40	33			The text revised to read: "...(Brenninkmeijer et al., 2007), satellite (Wecht et al., 2012; Worden et al., 2012), and…"
6	41	29			revise upper panel x-axis to be consistent with bottom panel x-axis
6	41	45			Change "%" to "‰"
6	41	52			Added the sentence "With *high confidence*, climate driven changes of emissions from wetlands are the main drivers of the global inter-annual variability of CH4 emissions. " before the sentence starting "The term 'wetlands' denotes...".
6	41	58			Italicize "confidence" and "low"
6	42	17			Text revised to add the confidence assessment. The line reads: "…global CH4 budget to be around 30% (medium confidence) (Lassey et al., 2007) and not around 20% as previously estimated (e.g.,"
6	42	55			Italicize "very unlikely"
6	43	48			Remove "likely"
6	44	4			Replace "548" with "553"
6	44	5			Replace "540" with "550"
6	44	6			Replace "8" with "3"
6	44	29			Italicize "likely"
6	45	18			Italicize "likely"
6	46	41	46	43	Sub-section 6.3.4.3. Replace the first sentence by: "For base year 2010, anthropogenic activities created ~210 (190 to 230) TgN of reactive nitrogen Nr from N2. This human-caused creation of reactive nitrogen in 2010 is at least 2 times larger than the rate of natural terrestrial creation of ~58 TgN (50 to 100 TgN yr–1) (Table 6.9, Section 1a)."

Chapter	From Page	From Line	To Page	To Line	Edit
6	47	24			Remove "likely"
6	47	26			Italicize "very likely"
6	47	46			Remove "likely"
6	47	49			Missing reference to Stevenson et al. (2006) added to read: "...,(f) Stocker et al. (2013), Stevenson et al. (2006).
6	51	31			Italicize "likely"
6	52	47	52	48	Italicize "confidence" and "low"
6	53	2			Cross reference (Figure 1.16) should be replaced with (Box 1.1).
6	54	14			Sentence changed to read: "… but show a large spread across models. With *very high confidence*, for all four RCP scenarious, all models project continued ocean uptake throughout the 21st century, with higher uptake corresponding to higher concentration pathways. For RCP4.5 and ..."
6	54	45			Likelihood assessment added. Revised sentence to read: "…and storage (BECCS). It is *as likely as not* that sustained globally negative emissions will be required to achieve the reductions in atmospheric CO2 in the RCP2.6 scenario."
6	55				Table 6.12 for the time period 1850-2011: change "365" to "375"
6	56	18			After (Koven et al., 2011), changed text to: "Overall, there is *high confidence* that reductions in permafrost extent due to warming will cause thawing of some currently frozen carbon. However, there is low confidence on the magnitude of carbon losses through CO2 and CH4 emissions to the atmosphere. The magnitude of CO2 and CH4 emissions to the atmosphere is assessed to range from 50 to 250 PgC between 2000 and 2100 for RCP8.5. The magnitude of the source of CO2 to the atmosphere from decomposition of permafrost carbon in response to warming varies widely according to different techniques and scenarios. Process models provide different estimates of the cumulative loss of permafrost carbon: 7 to 17 PgC (Zhuang et al., 2006) (not considered in the range given above because it corresponds only to contemporary tundra soil carbon), 55 to 69 Pg (Koven et al., 2011), 126 to 254 PgC (Schaefer et al., 2011) and 68 to 508 PgC (MacDougall et al., 2012) (not considered in the range given above because this estimate is not obtained from a concentration driven, but for emission driven RCP scenario and it is the only study of that type so far). Combining observed vertical soil carbon profiles..."
6	56	25			"loss of permafrost carbon" replaced with "amount of thawed permafrost carbon"
6	56	27	56	28	Deleted sentence: "The best estimate range for carbon released from thawed permafrost by 2100 is 50-250 PgC for RCP8.5."
6	56	38			Additional text (statement of confidence) added, so it now reads: "...*very high confidence*. Overall, given evidence from Chapter 3 and model results from this chapter, it is *virtually certain* that the increased storage of carbon by the ocean will increase acidification in the future, continuing the observed trends of the past decades. "
6	57	17			Change (g) to (c) and (h) to (e) in figure caption.
6	57	30			Changed to read: "…atmospheric CO2 will reach 410 ppm, within a decade (Steinacher et al., 2009). Then, Aragonite undersaturation will become widespread in these regions at atmospheric CO2 levels of 500–600 ppm (Figure 6.28)."
6	59	44			Italicize "likely"
6	60	16			change "Figure 1" to "Figure 2"
6	60	33			Text completed with likelihood assessment after "… Nr production". "It is thus *likely* that N2O emissions from soils will increase due to the increased demand for feed/food and the reliance of agriculture on nitrogen fertilisers. "
6	61	2			Italicize "likely"
6	62	35			Change "There is *high confidence* that" to "It is *very likely* that"
6	63	24			Italicize "likely"
6	63	50			Confidence statement added. The paragraph starts with sentence: "Overall, there is *medium confidence* that emissions of CH4 from wetlands are *likely* to increase in the future under elevated CO2 and warmer climate."
6	65	23			Likelihood assessment added to the end of paragraph. "Overall, it is *likely* that subsequent emissions to the atmosphere caused by hydrate destabilisation would

Chapter	From Page	From Line	To Page	To Line	Edit
					be in the form of CO2, due to CH4 oxidation in the water column."
6	66	49			Likelihood assessment added. The paragraph should start with sentence: "With *very high confidence*, the physical, biogeochemical carbon cycle in the ocean and on land will continue to respond to climate change and rising atmospheric CO2 concentrations created during the 21st century."
6	67	12			Italicize "likely"
6	67	36			Repalce "augment" with "increase"
6	68				Table 6.14: italicize "likely" on two occasions in the right-most column
6	69	4	69	7	The sentense starting from "However, ..." replaced with likelihood statement "It is *likely* that CDR would have to be deployed at large-scale for at least one century to be able to significantly reduce atmospheric CO2."
6	69	41			Likelihood assessment added immediately after "… (Figure 6.40)". "It is thus *virtually certain* that the removal of CO2 by CDR will be partially offset by outgassing of CO2 from the ocean and land ecosystems."
6	69	43	69	44	Remove "at the time CDR will begin"
6	70	10			Remove "likely"
6	71	39			Remove "depends critically"
6	72	14			Italicize "confidence" and "very high"
6	72	15			Italicize "low"
6	72	45			Italicize "likely"
6	72	49			Italicize "likely"
6	73	17			Replace "associated with" with "caused by"
6	73	19	73	20	Italicize "confidence" and "low"
6	73	29			Remove "most likely"
6	73	30			Italicize "confidence" and "low"
6	74	4			Replace "removal of CO2" with "processes"
6	74	5			Italicize "unlikely"
6	74	9			Italicize "likely"
6	74	10			Italicize "confidence"
6	74	11			Italicize "low"
6	76	18			"200 PgC" replaced with "350 PgC"
6	76	39			Italicize "low confidence"
6	76	50			"200 PgC" replaced with "250 PgC"
6	110				Table 6.8, column 'Natural sources': 203 --> 193
6	110				Table 6.8, column 'Natural wetlands': 167 --> 157
6	110				Table 6.8, column 'Rice': 43 --> 45
6	110				Table 6.8, column 'Ruminants': 86 --> 87
6	110				Table 6.8, column 'Total chemical loss': 525 --> 515

Chapter	From Page	From Line	To Page	To Line	Edit
6	111				Additional numbers introduced to present contemporary assessment to CH4 budget and life times. That would add lines at the end of Tables 6.8 and 6.9 reflecting the science used in Chapters 2 and 11. This presents the scientific ranges and results across the community. The added lines refer to the budget in 2011, hence do not affect the numbers in text and the Figures.
6	111				Table 6.8 extended by: Global top-down (year 2011) 2011 (AR5)[38] Burden (Tg CH4) 4954±10 Atmospheric loss (Tg CH4 yr-1) 542±56 Atmos. increase (Tg CH4 yr-1) 14±3 Total source (Tg CH4 yr-1) 556±56 Anthropogenic source (Tg CH4 yr-1) 354±45 Natural source (Tg CH4 yr-1) 202±35
6	111				Table 6.8, column 'Imbalances (sources minus sinks)': 8 --> 3
6	111				Table 6.8, column 'Sum of sinks': 539 --> 567
6	111				Table 6.8, column 'Sum of sinks': 540 --> 550
6	111				Table 6.8, column 'Sum of sinks': 596 --> 599
6	111				Table 6.8, column 'Sum of sources': 548 --> 553
6	111				Table 6.8, column 'Sum of sources': 551 --> 541
6	112	9			Inserted a new cross reference and link to underlying sources of additional numbers listed in Tables 6.8 and 6.9: "Prather et al. (2012), updated to 2011 (Table 2.1) and used in Chapter 11 projections; uncertainties evaluated as 68% confidence intervals, see also Annex II.2.2 and II.4.2."
6	112				Insert "[39] Prather et al. (2012), updated to 2011 (Table 2.1) and used in Chapter 11 projections; uncertainties evaluated as 68% confidence intervals, see also Annex II.2.2 and II.4.2."
6	114	19			A new bullet added to the end of footnotes: "(i) Based on Prather et al. (2012), updated to 2011 (Table 2.1) and used in Chapter 11 projections; uncertainties evaluated as 68% confidence intervals, N2O budget reduced based on recently published longer lifetimes of 131±10 yrs, see Annex II.2.3 and II.4.3. "
6	114				Additional numbers introduced to Table 6.9 to ensure consistency across the Chapters.
6	114				Insert "[i] Based on Prather et al. (2012), updated to 2011 (Table 2.1) and used in Chapter 11 projections; uncertainties evaluated as 68% confidence intervals, N2O budget reduced based on recently published longer lifetimes of 131±10 yrs, see Annex II.2.3 and II.4.3."
6	114				Table 6.9 extended by: Global top-down (year 2011)[i] Burden (Tg N) 1553 Atmospheric Loss 11.9±0.9 Atmospheric Increase 4.0±0.5 Total Source 15.8±1.0 Natural Source 9.1±1.0 Anthropogenic Source 6.7±1.3
6	117				Table 6.15, row "BECCS…": 100 --> 125
6	117				Table 6.15, row "BECCS…": 100 --> 125
6	117				Table 6.15, row "Ocean enhanced...": Italicize "likely"
6	120				Figure 6.1 replaced with updated version (to insure revised C quantity)
6	123				Figure 6.2 replaced with revised version to change the global burden numbers achieved with revised conversion factor. The uppermost line should read: "Atmosphere (1984 + 2970 ± 45)"
6	125				Figure 6.4 replaced with corrected version. In the atmosphere box there is a black comma before the + sign, which has been removed.

Chapter	From Page	From Line	To Page	To Line	Edit
6	131				Figure 6.8 replaced with revised version - The labels added to X and Y axis.
6	143				Figure 6.20 replaced to change the text that sais "Climate CH4 lifetime (c)" to now say "Climate CH4 lifetime (c, g)"
6	157				Figure 6.33 replaced with copyedited version. The brackets added to y-axis labels.

Chapter 7: Clouds and Aerosols

Chapter	From Page	From Line	To Page	To Line	Edit
7	3	28	3	29	The last sentence of this bullet changed to read "In the event that such an association existed, a mechanism other than cosmic ray-induced nucleation of new aerosol particles would be needed to explain it."
7	3	41			Replace "low" with "weak"
7	4	23	4	23	Footnote 2 placed after the "extremely likely" statement
7	7	31	7	31	Replace "net radiative forcing" with "net forcing"
7	17	31	17	31	Change "Clear-sky feedback parameters " to "Feedback parameters with water vapour or the lapse rate "
7	18	46	18	46	"7.9" changed to "7.10"
7	19	8			Insert "The net feedback parameters are broken down in their longwave (LW) and shortwave (SW) components." after "available."
7	19	19	19	19	"Section 2.5.7" changed to "Section 2.5.6"
7	26	56			Replace "U.S." with "North America"
7	33	52	33	52	Change "OC" to "other organic aerosols"
7	38	2	38	2	Change "orange" to "blue" in figure caption.
7	39	17	39	17	Change "aerosol patchiness manifesting" to "aerosol spatial inhomogeneity causing"
7	46	55	46	55	"GCR" changed to "cosmic ray"
7	49	10	49	10	Change "dotted lines" to "dotted and dashed lines, respectively"
7	57	11	57	11	Change "the change in globally averaged surface temperature" to "the change in surface temperature averaged over the Tropics"
7	58	49	58	49	Change "(D) large-eddy simulation (LES) and cloud-resolving model (CRM) studies of radiative convective equilibrium " to "(D, E) cloud-resolving model (CRM) and large-eddy simulation (LES) studies of radiative convective equilibrium"
7	59	1	59	1	Change "by 6 to 10% °C of warming" to "by 6 to 10% per °C of warming"
7	63	22	63	22	Change " Stippling denotes agreement on the sign of the precipitation anomaly in at least 9 out of the 12 models." to " Stippling denotes agreement on the sign of the anomaly in at least 9 out of the 12 models."
7	63	33	63	33	Delete "albeit". Change "rapid" to "large". Add "high confidence" in brackets.
7	64	27	64	27	Change "… anthropogenic greenhouse gases" to "… anthropogenic GHGs (high confidence)"
7	64	39	64	39	Change "Many models ... as strong as 4 Wm-2, but ...." to "Many models ... as strong as 4 Wm-2 (medium confidence), but ...."
7	64	45	64	45	Change "There is robust agreement among models that …" to "There is robust agreement among models and high confidence that …"
7	64	55	64	55	Change "... would result" to "... would result (high confidence)"
7	70	5			Change "pink and blue" to "yellow and grey"

Chapter 8: Anthropogenic and Natural Radiative Forcing

Chapter	From Page	From Line	To Page	To Line	Edit
8	3	32	3	32	Add the following sentence after the full stop: 'Emissions of CO2 have made the largest contribution to the increased anthropogenic forcing in every decade since the 1960s.'
8	3	38	3	38	Change (0.15 to 0.19) to (0.14 to 0.20)
8	4	20			Replace "since" with "relative to"
8	4	24	4	24	After 'The total aerosol effect' add '(excluding BC on snow and ice)'
8	5	17	5	17	Add 'very' before 'likely'
8	5	18			Remove "-" before "0.00"
8	5	27	5	27	Change '-0.10 (-0.13 to -0.07) Wm-2' to '-0.11 (-0.15 to -0.08) Wm-2'
8	5	28	5	28	Change '-0.05 (-0.07 to -0.03) Wm-2' to '-0.06 (-0.08 to -0.04) Wm-2'
8	5	37	5	37	Change '(10 to 95%)' to '(at least 30%)'
8	8	18			Change 5 to 4, so it refers to 7.3.4.2
8	10	4			Change 2 to 6, so it refers to 8.6.2
8	13	53	13	53	Change 'Lacis and Hansen (1974)' to Lacis et al. (1990)
8	15	1	15	1	Change in Table 8.1 'Olsen et al. (2002)' by 'Olsen et al. (2001)'
8	16	14			Italicize "likely"
8	16	37	16	37	Change '479 to 706' to '542 to 852'
8	16	37	16	37	Change 'Table 6.7' to 'Table 6.8'
8	17	2	17	2	Change 'quite' to 'much'
8	20	26			Italicize "medium confidence"
8	21	3	21	3	Add after '0.03 Wm-2' the following: ', an increase of 6% since 2005 (See Table 8.2),'
8	21	12	21	12	Add before sentence starting with 'Since': 'The rate of change in the total WMGHG RF was higher in 1970 to 1990 with high confidence compared to the present due to higher contribution from non-CO2 gases especially the halocarbons.'
8	21	17	21	17	Add after end of sentence ending with ' in that order' the following: ', which account for about 85% of the total halocarbon RF (See Table 8.2).'
8	21	39	21	39	Change 0.0001 to 0.0002
8	21	40	21	40	Add Arnold et al. (2013) to the list of references.
8	22	1	22	1	Change line for NF3 in Table 8.2 and should read: NF3 0.9 0.4 0.0002 0.0001
8	22	2	22	2	Change value for CF4 from 40 ppt to 35 ppt
8	23	10			Italicize "likely"
8	23	16			Italicize "very likely"
8	23	51			Italicize "low confidence"
8	24	42	24	42	Change 'section 6.4.8.3' to 'section '6.4.8.2'
8	24	54			Insert "(Wm-2)" after "forcing" and change "2010" to "2011"

Chapter	From Page	From Line	To Page	To Line	Edit
8	26	17	26	18	Italicize "high confidence"
8	27	32			add "(Wm-2)" after "RF"
8	28	30			Italicize "likely"
8	28	31			Insert "best" before "estimate"
8	29	17			Insert "the temporal development of " before "RF"
8	29	26	29	26	Change 'section 7.2.5' to 'section 7.2.7'
8	32	6			Italicize "very likely"
8	32	8			Italicize "about as likely as not"
8	33	21	33	21	Add before 'and includes the' the following: ', and thus very likely negative,'
8	33	34	33	34	Remove 'solar' within TIM
8	34	8			Put "confidence" in regular instead of italic
8	34	20	34	20	Change 'section 5.2.1.1' to 'section 5.2.1.2'
8	35	18	35	18	Change year of the Ermolli et al. Reference from 2012 to 2013
8	35	19	35	19	Change year of the Ermolli et al. Reference from 2012 to 2013
8	36	18	36	18	Change '-0.10 (-0.13 to -0.07) Wm-2' to '-0.11 (-0.15 to -0.08) Wm-2'
8	36	19	36	19	Change '-0.05 (-0.07 to -0.03) Wm-2' to '-0.06 (-0.08 to -0.04) Wm-2'
8	37	32			Remove "Chaiten (Ch)"
8	38	30	38	30	Replace 'volcanic impacts on contrail-generated' to 'impacts of contrail-generated'
8	39	8			Replace "RF" with "forcing"
8	39	13	39	14	Remove the sentence starting with 'The colour codes ..'
8	39	20	39	20	Add after the full stop the following sentence: 'The colours are adopted based on the evidence and agreement shown in Figure 1.11. Dark green is "High agreement and Robust evidence", light green is either "High agreement and Medium evidence" or "Medium agreement and Robust evidence", yellow is either "High agreement and limited evidence" or "Medium agreement and Medium evidence" or "Low agreement and Robust evidence", orange is either "Medium agreement and Limited evidence" or "Low agreement and Medium evidence" and finally red is "Low agreement and Limited evidence".'
8	40	1	40	1	For contrails change the 'Change in understanding since AR4' column from 'No major change' to 'Elevated owing to more studies'
8	41	3			Italicize "confindence"
8	41	4			Italicize "confindence"
8	41	20	41	20	Add after the full stop the following sentence: 'The colours are adopted based on the evidence and agreement shown in Figure 1.11. Dark green is "High agreement and Robust evidence", light green is either "High agreement and Medium evidence" or "Medium agreement and Robust evidence", yellow is either "High agreement and limited evidence" or "Medium agreement and Medium evidence" or "Low agreement and Robust evidence", orange is either "Medium agreement and Limited evidence" or "Low agreement and Medium evidence" and finally red is "Low agreement and Limited evidence".'
8	41	41			Italicize "unlikely"
8	42	1			44% --> 43%
8	42	8	42	8	The open cell for 'Total anthropogenic' RF for AR5 can be filled with 'Not estimated'
8	43	24	43	24	Add after '0.48' the following: '(0.43 to 0.53)'

Chapter	From Page	From Line	To Page	To Line	Edit
8	43	24	43	24	Add after '0.97' the following: '(0.80 to 1.14)'
8	43	29	43	29	Add after '0.10' the following: '(0.06 to 0.14)'
8	43	29	43	29	Add after '0.23' the following: '(0.18 to 0.29)'
8	43	34	43	34	Change The overall effect of anthropogenic emissions of NOx is a negative RF' to the following: The best estimate of the overall effect of anthropogenic emissions of NOx is a negative RF (-0.15 (-0.34 to +0.02) Wm-2) '
8	43	40	43	40	Add new paragraph after page 43, line 40 (after "amount of available information"): For the WMGHG, the ERF best estimate is the same as the RF. The uncertainty range is slightly larger, however. The total emission-based ERF of WMGHG is 3.00 [2.22 to 3.78]. That of CO2 is 1.68 [1.33 to 2.03]; that of CH4 is 0.97 [0.74 to 1.20]; that of stratospheric ozone-depleting halocarbons is 0.18 [0.01 to 0.35]
8	44	2	44	2	Add just after 'given as Fossil and Biofuel in the figure' the following: 'where biofuel refers to solid biomass fuels'
8	44	12	44	12	Add the following sentence after the full stop: 'Emissions of CO2 have made the largest contribution to the increased anthropogenic forcing in every decade since the 1960s.
8	44	49	44	51	Replace the sentence 'For the 1998-2011 period the natural forcing is negative and the offset of anthropogenic forcing by natural forcing over this period is likely substantial' with the following two sentence: ' For the 1998-2011 period the natural forcing is very likely negative and has offset 2 to 89% of the anthropogenic forcing increase. It is likely that the natural forcing change has offset at least 30% of the anthropogenic forcing increase and very likely that it has offset at least 10% of the anthropogenic forcing increase.
8	45	15	45	15	End of Caption for Figure 8.18 ("Annex II"). Add "The total antropogenic forcing was 0.57 [0.29 to 0.85] in 1950, 1.25 [0.64 to 1.86] in 1980 and 2.29 [1.13 to 3.33] W m-2 in 2011."
8	45	28	45	28	Add after 'is close to 1.0' the following: '(0.7 to 1.3)'
8	45	33	45	33	Add at the end of the sentence the following: 'with total natural RF of 0.0 (-0.1 to +0.1) Wm-2'
8	46	30			Italicize "likely"
8	46	38	46	38	Change 'exclusively' to 'directly'
8	47	5	47	6	Remove "(values are presumably larger than ACCMIP estimates due to 6 use of ERF rather than RF for GHGs)"
8	47	6			Insert "relative to 2000" after "Forcing"
8	47	20			Italicize "likely"
8	50	14			Italicize "low"
8	50	15			Italicize "very low"
8	51	9			Italicize "confidence"
8	51	49			Italicize "confidence" and "very low"
8	52	3			Italicize "likely"
8	52	9			"Section 8.4.1.3.1" --> "Section 8.4.1.4.1"
8	52	36			Italicize "very low"
8	58	15	58	15	Change 'GTP' 'the GTP of CH4'
8	58	39	58	39	Add a footnote 'b' after CH4 in Table 8.7, with the following text: 'These values do not include CO2 from methane oxidation. Values for fossil methane are higher by 1 and 2 for the 20 and 100 year metrics, respectively (Table 8.A.1).'
8	58	39	58	39	In the last row change 9570 to 9560
8	58				Table 8.7, row 'CH4': in last column change "4.3" to "4"

Chapter	From Page	From Line	To Page	To Line	Edit
8	61	54			Change "Box 6.2" to "Box.6.1"
8	62	25			Italicize "confidence"
8	66	17	66	17	Change 'Table 8.A.7' to 'Table 8.SM.18'
8	73	58	73	58	Change current Ermolli et al. Reference to 'Ermolli, I., K. Matthes, T. Dudok de Wit, N. A. Krivova, K. Tourpali, M. Weber, Y. C. Unruh, L. Gray, U. Langematz, P. Pilewskie, E. Rozanov, W. Schmutz, A. Shapiro, S. K. Solanki, and T. N. Woods, 2013: Recent variability of the solar spectral irradiance and its impact on climate modelling, Atmospheric Chemistry and Physics, 13, 3945-3977.
8	78	7	78	8	Change Lacis and Hansen (1974) refernce to 'LACIS, AA; WUEBBLES, DJ; LOGAN, JA, 1990, JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES Volume: 95 Issue: D7 Pages: 9971-9981 DOI: 10.1029/JD095iD07p09971 '
8	80	51	80	51	Change existing Olsen et al. reference by the following: 'Olsen, S. C., C. A. McLinden, and M. J. Prather (2001), Stratospheric N2O–NOy system: Testing uncertainties in a three-dimensional framework, J. Geophys. Res., 106(D22), 28771, doi:10.1029/2001JD000559.'
8	88	1	88	1	GTP 100-yr for CH4 should be changed to 4 (instead of 4.3) and for fossil fuel CH4 to be changed to 6 (instead of 5.7).
8	88	1	98	1	All the '0' values for the metrics GWP 20-yr, GWP 100-yr, GTP 20-yr, GTP-50 yr, and GTP 100-yr can be replaced by '<1'. In addition the following values given as '1' can be given as '<1': HFC-161 for GTP 50 and 100 yr, (Z)-HFC-1225ye for GWP 20 yr, (E)-HFC-1234ze for GWP 100 yr, HFC-1243zf for GWP 20 yr, 1,2-Dichloroethane for GWP 100 yr and GTP 20 yr, HFE-365mcf3 for GWP 100 yr and GTP 20 yr, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-Nonadecafluoroundecan-1-ol for GWP 20 yr, HFE-216 for GWP 20 yr, 2,2,2-Trifluoroethyl 2,2,2-trifluoroacetate for GTP 100 yr, Methyl 2,2-difluoroacetate for GTP 50 yr, 1,1,2,2-Tetrafluoro-3-methoxy-propane for GWP 100 yr and GTP 20 yr, 2-Fluoroethanol for GWP 100 yr and GTP 20 yr, 2,2-Difluoroethanol for GTP 50 yr.
8	89				Table 8.A.1, row '(E)-1-Chloro-3,3,3-trifluoroprop-1-ene': in columns 'GTP 50 year' change "0" to "<1"
8	90				Table 8.A.1, row '(E)-HFC-1234ze': in columns 'GWP 100 year' change "0" to "<1"
8	90				Table 8.A.1, row '(Z)-HFC-1234ze': in columns 'GWP 20 year' change "0" to "<1"
8	90				Table 8.A.1, row 'HFC-1234yf': in columns 'GWP 20 year' change "0" to "<1"
8	97				Table 8.A.1, row '2,2,2-Trifluoroethyl 2,2,2-trifluoroacetate': in columns 'GTP 100 year' change "1" to "<1"
8	97				Table 8.A.1: replace "92.2 days" with "91.3 days"
8	98	11	98		Change "For non-fossil CH4 we assume" to "Methane values without the CO2 effect from fossil methane are thus appropriate for fossil methane sources for which the carbon has been accounted for elsewhere, or for biospheric methane sources for which there is a"
8	100	2			Change "2000" to "2011"
8	100				Table 8.A.2: revise all numbers to (from top to bottom): -2640 -2100 -2150 -914 -223 -98 -37 -46 -261 -152 -319 -2110 -1250 -19,000 -44,500 -32,000 -40

Chapter	From Page	From Line	To Page	To Line	Edit
					-60
8	100				Table 8.A.3: change "-29" to "-2.9"
8	101				Table 8.A.6: add superscript "d" to "OC (4 regions)"
8	101				Table 8.A.6: change "168" to "68"
8	121	1	121	1	Updated version of Figure 8.18
8	122	1	122	1	Updated version of Figure 8.19
8	132				Revised Figure 8.29 (right y-axis)
8	SM-13	28	SM-13	28	The P95 value for 'BC on snow' can be corrected from 0.08 to 0.09
8	SM-20	6	SM-20	6	Change ‘RE’ to ‘A’
8	SM-21	11	SM-21	11	Change twice RECH4 by ACH4
8	SM-21	41	SM-21	41	Change ACH4(ppb) and AN2O(ppb) in ratio by RECH4 and REN2O
8	SM-22	1	SM-47	2	Updated version of Table 8.SM.16
8	SM-57	12	SM-57	12	Change ‘aircraft induced cirrus (AIC)’ with ‘contrail induced cirrus (CIC)’
8	SM-57	14	SM-57	14	Change ‘AIC’ with ‘CIC’
8	SM-57	21	SM-57	21	Change ‘AIC’ with ‘CIC’

Chapter 9: Evaluation of Climate Models

Chapter	From Page	From Line	To Page	To Line	Edit
9	4	9	4	10	Change “1960 to present” to “1961 to 2005”
9	5	6	5	6	about two-thirds → the majority
9	28	25	29	13	After FGD, we were informed by Ch08 that there was an error in the volanic (i.e., stratospheric aerosol) ERF time series. They had erroneously used the January mean instead of the annual mean. Correcting for this requires a modification of Box 9.2, Figure 1 and many of the numbers in the text. Number changes are given in following comments; no change in assessment required. However, the corresponding changes need to be made to Box TS.3, in TS-28, paragraphs 3 and 4.To take into account that the uncertainty ranges are slightly more asymmetric than before and to make transfer to TS easier, we now give ranges rather than plus-minus
9	28	29	28	29	2 ± 0.7 → 2 [1.3 to 2.7]
9	28	34	28	34	0.23 ± 0.11 → 0.22 [0.1 to 0.34]
9	28	35	28	35	0.34 ± 0.10 → 0.32 [0.22 to 0.42]
9	28	36	28	36	0.30 ± 0.10 → 0.31 [0.19 to 0.40]
9	28	39	28	39	0.13 [0.06 to 0.31] → 0.12 [0.05 to 0.29]
9	28	39	28	39	0.19 [0.10 to 0.40] → 0.19 [0.09 to 0.39]
9	28	39	28	40	0.17 [0.08 to 0.36] → 0.18 [0.08 to 0.37]
9	28	43	28	43	0.04→0.05
9	28	47	28	47	–0.14 ± 0.10 → –0.16 [–0.27 to –0.06]
9	28	48	28	48	0.0 ± 0.01 → 0.01 [–0.00 to +0.01]
9	28	53	28	53	–0.04 → –0.06
9	28	57	28	57	remove "Table 8.6, Table 8.7;" because the two tables are not explicitly related to the confidence in AOD trend.
9	29	2	29	2	"Table 8.6"→ "Table 8.5"
9	29	9			0.05 → 0.03
9	29	47			Insert "and other anthropogenic" after "GHG"
9	37	17	37	17	“(1960-2005)” → “(1961-2005)”
9	48	2			change "climatologies aerosol" to "observations of aerosol"
9	50	35	50	41	In two cases: change “Anstey et al., 2012” to “Anstey et al., 2013”; update reference list
9	51	53			CMIP3 --> CMIP5
9	62	19			Insert "and is roughly ±3ºC" after "regions"
9	67	26			replace “(b) are from CMIP3" with “(b) are from CMIP5 and CMIP3”
9	69	4	69	7	Replace text from "Changes from CMIP3....are statistically indistinguishable" with "The feedbacks are generally similar between CMIP3 and CMIP5, and the water vapour, lapse rate, and cloud feedbacks are assessed in detail in Chapter 7. The surface albedo feedback is assessed here to be *likely*positive. There is *high confidence* that the sum of all feedbacks (excluding the Planck feedback) is positive."
9	146		147		Table 9.A.1: change all occurences of "Ilyina et al., 2012" to"Ilyina et al., 2013"; update reference list
9	149				Table 9.A.2, row '(1) DCESS': in column 'Biosphere' change "(1)" to "(1,2)"
9	161		161		Figure updated (one incorrect time series in Panel b).

Chapter	From Page	From Line	To Page	To Line	Edit
9	202		202		Typo in an entry of Panel b (should read TAS-t, not TAS); Panel a: WBC entry removed; AMOC entry corrected. **Figure updated.**

Chapter 10: Detection and Attribution of Climate Change: from Global to Regional

Chapter	From Page	From Line	To Page	To Line	Edit
10	1	55	1	55	Replace "Snow Cover and Permafrost" with "Snow Cover"
10	3	32			Change "10.31" to "10.3.1"
10	5	3	5	4	replace "....decrease in oxygen dissolved in the oceans...." replaced by "...decrease in oxygen between 1960's to 1990's in the oceans can..."
10	5	40	5	40	Replace "...surface melting of Greenland since 1990" with "...surface melting of Greenland since 1993"
10	5	41			Italicize "likely"
10	5	41			Italicize "likely"
10	6	25			“0th century” -> “20th century”
10	6	45			Italicize "extremely unlikely"
10	6	49			Italicize "extremely unlikely"
10	6	52			Italicize "unlikely"
10	12	52			"(b)" --> "(c)"
10	16	12			“Trenberth (2011)” -> “Trenberth (2011a).”; update reference list
10	18	1	18	1	Replace "Taken from Figure 10.1, using same models and HadCRUT4 data set." with "Taken from models used in Figure 10.1 and shown in Figure 10.7, and with HadCRUT4 data set."
10	20	47	20	48	Replace "This provides evidence" with "Overall there is some evidence"
10	22	10			Italicize "high confidence"
10	22	36			Replace [-0.06 to -0.02] with [-0.08 to 0.00]
10	22	37	22	37	Replace "8.4.1.1.1" with "8.4.1.1"
10	31	24			“Trenberth (2011)” -> “Trenberth (2011b).”; update reference list
10	34	48			Change “and confidence is low that” to “and there is *low confidence* that”
10	37	19			Change ""likely"" to "*likely*"
10	37	22			Remove "Solomon et al., 2007"
10	37	48			Italicize "high confidence"
10	38	28			Delete "very"
10	38	33			Replace "While there is very high" with "Although there is high"
10	40	12			Italicize "high confidence"
10	40	14	40	14	Add after "anthropogenic forcing"….. "antrhopogenic forcing since the 1960's."
10	40	19	40	19	Replace "..precipitation minus evaporation δ (P-E) for…" with "...precipitation minus evaporation δ (P-E) in mm.yr-1 for.." where the -1 is superscripted
10	41	11	41	11	Delete 'and from Greenland ice sheet melt'
10	41	31	41	31	Delete "Box 6.5, and" ie text in bracket becomes see "Section 6.4.5"
10	41	45	41	45	Replace "(see Box 6.5)" with "(see Sections 3.8.3 and 6.4.5)"
10	41	51			Italicize "about"

Chapter	From Page	From Line	To Page	To Line	Edit
10	42	4	42	4	Replace "snow cover and permafrost." with " and snow cover." Permafrost is not assessed in this chapter 10 ….
10	42	4			Delete 'and permafrost'
10	42	15	42	15	Replace "(see Box 5.2)" with "(see Box 5.1)"
10	43	5	43	6	replace "…from warm anomalies in internal climate…" to "…from warm anomalies from internal climate…"
10	43	15			Italicize "high confidence"
10	44	53	44	53	Replace "and 13.4.2)" with "and 13.3.3)"
10	45	22	45	22	Insert "Since 2007, internal variability is *likely* to have further enhanced the melt over Greenland." after sentence ending "…broader scale Arctic changes."
10	45	47	45	49	Replace the sentence "These factors combined with incomplete models in Antarctic ice sheet mass loss result in low confidence in scientific understanding, and attribution of the mass balance of Antarctica to human influence is premature. " with "Due to a low level of scientific understanding there is low confidence in attributing the causes of the observed loss of mass from the Antarctic ice sheet since 1993."
10	46	23	46	24	Italicize "high confidence"
10	46	26	46	26	Replace "Snow Cover and Permafrost" with "Snow Cover"
10	46	26			Delete 'and permafrost'
10	47	4			Italicize "likely"
10	49	32	49	34	Replace all three lines with "(Seneviratne et al, 2012) that there is medium confidence that anthropogenic forcing has contributed to a global-scale intensification of heavy precipitation over the second half of the 20th century in land regions where observational coverage is sufficient for assessment."
10	49	53	49	53	Replace "(Section 2.6.2.2)" with "(2.6.2.3)"
10	50	25	50	25	Replace "(Section 2.6.2.2)" with "(2.6.2.3)"
10	50	49			Italicize "more likely than not"
10	53	9	53	9	Replace "October to December" with "September to November"
10	54	22			Change "Since" to "Because" and italicize "very likely"
10	54	47			Italicize "extremely unlikely"
10	55	2	55	2	Replace "Sections 5.3.5; Table 5.A.1; 5.5 for regional records" with "Table 5.A.1; Sections 5.3.5; 5.5.1 for regional records"
10	56	52	56	52	Replace "(Frank et al, 2007; Frank et al, 2010) with "(Frank et al, 2007)"
10	58	35	58	35	Change "(Section 12.5.3.1.; see Box 12.1)" to "(Section 12.5.3; see Box "12.2"
10	58	35	58	35	Replace "Section 12.5.3.1" with "Section 12.5.3"
10	59	27	59	29	Italicize "very likely", "very unlikely", "very unlikely", "very likely"
10	61	5	61	5	Replace "Section 12.5.3.1" with "Section 12.5.3"
10	61	22	61	23	replace "prior information … distributions" with "some kind of prior information"
10	61	55	61	55	replace "estimate" with "provide information on" (clarity)
10	62	10	62	10	replace "including indirect aerosol effect" with "including further indirect aerosol effects"
10	62	44	62	44	Change "10 more years" to "9 more years"
10	65	16	56	17	Italicize "high confidence" and "medium confidence"
10	65	24	65	48	Caption Figure 10.20: italicize all "likely", "extremely unlikely", as well as "medium", "low", and "high" associated with "confidence"

Chapter	From Page	From Line	To Page	To Line	Edit
10	66	4	66	4	replace "0.1W m-2" with "-0.1W m-2" (missing minus sign)
10	66	36	66	36	Replace "Section 6.5.1.2" with "Section 12.5.4.2"
10	68	21			Change “the Arctic and but for Antarctica” to “the Arctic and Antarctica”
10	69	6			Remove "atmospheric" before "moisture"
10	69	10			Italicize "very likely"
10	96	4			Italicize "medium"
10	96				Table 10.1, row 'Result', column (2): Italicize “Very high”, “High”, “Medium”, “Low”, “Very low”
10	96				Table 10.1, row 'Result', column (4): Delete “(limited, medium, robust)” and replace "Models (9)" with "Models (Chapter 9)"
10	99				Italicize "high confidence" in row "10", right-most column
10	99				Table 10.1, row "(10)", column (6): Italicize “high confidence"
10	100				Italicize "very high confidence" in row "12", right-most column
10	100				Table 10.1, row "(12)", column (6): Italicize “Very high confidence"
10	100				Table 10.1: Change "Observed pattern of decrease in oxygen content is, in part, attributable to anthropogenic forcing." to "Observed pattern of decrease in oxygen content from the 1960s to the 1990s is, in part, attributable to anthropogenic forcing."
10	101				Table 10.1, row "(19)", column (6): Italicize “low confidence"
10	103				Table 10.1, row "(23)", column (5): Delete "and" so that it reads "that ozone depletion drive an increase"
10	104				Table 10.1, row "(30)", column (6): Replace "High data uncertainty (individual stations only mostly around the coast) and large uncertainty internal variability." with "High observational uncertainty and sparse data coverage (individual stations only mostly around the coast)."
10	127	1	127	1	Replace figure with updated version.
10	128		128		Replace Figure 10.20a and b with updated figures from Otto et al. Replace 'Harris and Sexton (2011)' with 'Harris et al., 2013' in Figure legend.
10	SM				Insert the following: Ocean basin definition (Latitudes) are: • Southern Ocean: south of 50°S • South Pacific: 50°S-Equator • South Atlantic : 50°S-Equator; up to 20°E; • Indian Ocean: 50°S:30°N; 20°E to Australia (Tasmania) • North Pacific, North Atlantic: Equator to 70°N"
10	SM				SM for ECS Fig10.20b "Otto et al. (2013) – Two sets of data are used: in solid is the 1979–2009 average, and in dashed is the 2000–2009 average. Distributions are shown with percentiles co-inciding with corresponding confidence intervals from the likelihood profile reported in the paper, which for Gaussian constraints is identical to a uniform sampling of the observables." Replaces this text in the supplement for figure 10.20b: "Otto et al. (2013) – Two sets of data are used: in solid is the 1979–2009 average, and in dashed is the 2000– 2009 average. No processing was required."

Chapter 11: Near-term Climate Change: Projections and Predictability

Chapter	From Page	From Line	To Page	To Line	Edit
11	3	1			change to 11.4.2 to 11.3.2
11	3	6	3	8	change to "Combined reductions of BC and co-emitted species (78%) on top of methane reductions (24%) would further reduce warming (low confidence), but uncertainties increase. {Section 7.6, Chapter 8, 11.3.6.1, Figure 11.24a, 8.7.2.2.2, Table AII.7.5a}"
11	3	30	3	31	Revise sentence to read "In the near term, differences in global mean surface air temperature change across RCP scenarios for a single climate model are typically smaller than differences between climate models under a single RCP scenario."
11	3	39	3	40	change" Figure 11.9 and 11.10" to "Figures 11.10 and 11.11"
11	3	51	3	51	change "11.4.2" to "11.3.2"
11	4	4	4	5	Revised ES statement "There is medium confidence in near-term projections of a northward shift of Northern Hemisphere storm tracks and westerlies. {11.3.2}"
11	4	13	4	14	Revised ES statement:"... However, the rate and magnitude of weakening is very uncertain and, due to large internal variability, there may be decades when increases occur. {11.3.3}"
11	4	13			delete "(especially)"
11	4	22			insert “for at least 5 consecutive years” before the closing bracket: “Arctic Ocean (sea ice extent less than 1 x 106 km2 for at least 5 consecutive years) in September.”
11	4	26	4	29	Revised ES statement: change to "In most land regions …"
11	4	37	4	37	Delete "and land use change"
11	4	45	4	53	Revised ES statement: "The range in projections of air quality (O3 and PM2.5 in near-surface air) is driven primarily by emissions (including CH4), rather than by physical climate change (medium confidence). The response of air quality to climate-driven changes is more uncertain than the response to emission-driven changes (high confidence). Globally, warming decreases background surface O3 (high confidence). High CH4 levels (RCP8.5, SRES A2) can offset this decrease, raising 2100 background surface O3 on average by about 8 ppb (25% of current levels) relative to scenarios with small CH4 changes (RCP4.5, RCP6.0) (high confidence). On a continental scale, projected air pollution levels are lower under the new RCP scenarios than under the SRES scenarios because the SRES did not incorporate air quality legislation (high confidence). [11.3.5, 11.3.5.2; Figures 11.22 and 11.23ab, AII.4.2, AII.7.1–AII.7.4]"
11	4	55	5	6	Revised ES statement: "Observational and modelling evidence indicates that, all else being equal, locally higher surface temperatures in polluted regions will trigger regional feedbacks in chemistry and local emissions that will increase peak levels of O3 and PM2.5 (medium confidence). Local emissions combined with background levels and with meteorological conditions conducive to the formation and accumulation of pollution are known to produce extreme pollution episodes on local and regional scales. There is low confidence in projecting changes in meteorological blocking associated with these extreme episodes. For PM2.5, climate change may alter natural aerosol sources (wildfires, wind-lofted dust, biogenic precursors) as well as precipitation scavenging, but no confidence level is attached to the overall impact of climate change on PM2.5 distributions. [11.3.5, 11.3.5.2, Box 14.2]"
11	6	13			Insert "(in the technical sense of ‘skilful’ as outlined in 11.2.3.2 and FAQ 11.1)" after "predictions"
11	7	41			Remove ", but not a complete picture"
11	12	13	12	14	Delete "although the most common method is the multi-model approach"
11	12	21	12	22	Replace setence starting with "A problem..." with "A problem with the multi-model approach is the INTER-dependence of the climate models used in current forecast systems (Power et al. 2012; Knutti et al. 2013), is expected to lead to co-dependence of forecast error."
11	12	53	12	54	Replace "as a prediction. This is in contrast to projection studies noted in the previous paragraph where no attempt at initialization is made" with ", and projections. See Box 11.1 and FAQ 11.1 for further details."
11	12	53			Replace "studies attempting" with "between predictions in which attempts are made"
11	13	9			Insert "included in the CMIP5 near-term experiment" after "the models"
11	14	9	14	11	Revise to read "Sampling error in the estimation of the mean climatology affects the success of this approach. This is also the case for full-field initialization, although as anomaly initialisation is affected to a smaller degree by the drift, the sampling error is assumed to be smaller (Hazeleger et al., 2013a)."

Chapter	From Page	From Line	To Page	To Line	Edit
11	14	28	14	29	Remove "In other words, a probabilistic prediction is considered reliable if a user can rely on it to make a decision, even if the prediction is not skilful with respect to a naïve prediction."
11	14	53	14	55	Replace sentence starting with "The skill…" with "The skill of seasonal predictions can vary from generation to generation (Power et al. 1999) and from one generation of forecast systems to the next (Balmaseda et al., 1995)."
11	15	2			Remove "interannual" and replace "of the" with "in"
11	15	6			Replace "predictability" with "predictive skill"
11	15	15			Insert "from initialization" after "improvements"
11	16	1	16	1	Replace "of" with "in hindcasting"
11	16	19	16	20	Replace "several" with "two" and "three" with "two"
11	17	2	17	4	Revise sentence starting with "The sub-polar…" to read "Skill in hindcasts of subpolar Atlantic temperature, which is evident in Figure 11.4, is improved more by initialization than is skill in hindcasting sub-tropical Atlantic temperature (Garcia-Serrano et al., 2012; Robson et al., 2012; Hazeleger et al., 2013b)."
11	17	3	17	4	Change reference to Vecchi et al. (2013) not 2012
11	17	45			Italicize "very low confidence"
11	18	6	18	7	Remove "In this situation a user might make some very poor decision based on such uncalibrated probabilities."
11	18	13			Italicize "medium confidence"
11	19	21	19	23	Remove "Apart from the low sampling of the start dates, the length of the forecasting period is limited to the period over which reasonably accurate estimates of the ocean initial state can be made, which starts around 1960. This fact also limits the sample size to estimate the forecast quality."
11	19	38			Insert "surface temperature" before "spread"
11	19	56	19	56	change to Box 9.2
11	20	12			Insert "highly accurate" before "altimetry"
11	22	34			Insert "See Hawkins and Sutton (2009, 2011) for further details."
11	23	28			Revised "This provides evidence that some CMIP5 models have a higher sensitivity to GHGs and..." to " This provides evidence that some CMIP5 models have a higher transient response to GHGs and..."
11	23	41			Italicize "likely"
11	28	50			Insert "projected" before "increases"
11	29	19	29	19	change 9.4.1.3.3 to 9.4.1.4.3
11	29	56			change “internal variability is likely to be a dominant” to “internal variability may be a dominant”
11	29	58	29	58	change Eyrin et al (2013a) to Erying et al. (2013).
11	30	21	30	29	change both 11.18 to 11.16.
11	31	43	31	45	added following assessment statement to support ES: "In most land regions and in the near-term, the frequency of warm days and warm nights will thus likely continue to increase, while that of cold days and cold nights will likely continue to decrease."
11	32	47	32	49	added following assessment: Thus the frequency and intensity of heavy precipitation events will likely increase over many land areas in the near term, but this trend will not be apparent in all regions, because of natural variability and possible influences of anthropogenic aerosols.
11	33	21			Change "mid-term" to "near-term"
11	33	33	33	35	Change reference to Knutson et al. 2013a; also change to Knutson et al. (2013a) in table 11.2

Chapter	From Page	From Line	To Page	To Line	Edit
11	34		34		In Table 11.2: change "TS" to "TC"
11	35	28	35	29	change to "temperature (right panel … sea surface salinity (left panel …"
11	35	39			Insert sentence "These projected decreases in the Atlantic and in the western tropical Pacific are considered *likely*." at end of line
11	35	52			Change "Response uncertainty is likely to be a dominant contribution" to "Response uncertainty is a major contributor"
11	36	15			Replace "Therefore" with "Taking variability into account,"
11	36	25	36	28	Replace sentence starting with "Trends in many…" with "Trends due to changes in external forcing exist alongside considerable interannual and decadal variability. This complicates our ability to make specific, precise short-term projections, and delays the emergence of a forced signal above the noise."
11	36	33			Insert "consecutive" before "years"
11	37	5			Remove "regardless the particular aspects of near term projections"
11	37	15			Insert "consecutive" before "five"
11	39	17	39	18	Change "Tables AII.18.21 and AII.18.22" to "Tables AII.2.18 to AII.2.22"
11	40	4			Replace "Montzka et al., 2011; Prather et al., 2012" with "Voulgarakis et al., 2013"
11	40	33	40	33	remove "(68% confidence)"
11	40	50			Italicize "likely"
11	41	20	41	22	Replace "and are projected to follow these trends over the next few decades (e.g., decreasing in all RCPs by 2100 as global NOx declines, but increasing in RCP8.5 due to CH4 increases despite falling NOx emissions)." with "Small changes (<10%) are projected over the next few decades. By 2100 tropospheric O3 decreases in RCP2.6, 4.5 and 6.0 but increases in RCP8.5 due to CH4 increases."
11	41	24	41	25	Remove "Unger et al., 2006b; Bauer et al., 2007;"
11	41	34			Italicize "high confidence"
11	41		41		change all instances of Erying et al (2013a) to Erying et al (2013)
11	42	57	42	57	change to "Figure 11.22"
11	43	30	43	30	change reference from Kesik et al. 2006 to Forkel and Knoche 2006.
11	43	37	43	37	change 14.6.3 to Box 14.2
11	44	11			Replace "Roelofs, 2012" with "see Section 7.6"
11	44	13	44	16	Revise paragraph to "While PM2.5 is expected to decrease in regions where precipitation increases, the climate variability at these scales results in only low confidence for projections at best. Further, consensus is lacking on the other factors including climate-driven changes in biogenic and mineral dust aerosols, leading to no confidence level being attached to the overall impact of climate change on PM2.5 distributions. Further, consensus is lacking on the other factors, including climate-driven changes in biogenic and mineral dust aerosols, leading to low confidence in the overall impact of climate change on PM2.5 distributions.projections at best. Further, consensus is lacking on the other factors including climate-driven changes in biogenic and mineral dust aerosols, leading to no confidence level being attached to the overall impact of climate change on PM2.5 distributions."
11	44	14	44	16	Revise sentence starting with "Further…" to read "Further, consensus is lacking on the other factors including climate-driven changes in biogenic and mineral dust aerosols, leading to *no confidence level* being attached to the overall impact of climate change on $PM_{2.5}$ distributions."
11	44	16	44	16	change "are highly" to "remain"
11	44	48			Remove "11.22"
11	44	52	44	52	change "5–14 ppb over continental-scale regions ,on average about 8 ppb above RCP4.5 and RCP6.0 which include" to "5 to 14 ppb over continental-scale regions, and on average about by 8 ppb (25% above current levels) above RCP4.5 and RCP6.0 which include"

Chapter	From Page	From Line	To Page	To Line	Edit
11	45	34	45	34	Delete "near-term"
11	46	14			Replace "are highly" with "remain"
11	46				Change all occurrences of "Hodnebrog et al., 2012b" and "Hodnebrog et al., 2012a" to "Hodnebrog et al., 2012". In the reference list "Hodnebrog et al., 2012b" is removed and "Hodnebrog et al., 2012a" becomes "Hodnebrog et al., 2012"
11	47	9	47	9	change 11.3.4.4 to 11.3.4
11	47	44	47	45	Change to read "… primarily to increasing CH4 and CO2. By 2050 the inter-scenario spread is 0.8ºC whereas the model spread for each scenario is only 0.6º. At 2040 …"
11	47	57	47	57	Replace "pre-industrial era" with "the early instrumental period"
11	48	13	48	20	Delete paragraph starting with "In terms of geographic patterns of warming…"
11	50	34			Replace "The" with "Some of the"
11	50	41			Italicize "low confidence"
11	50	42			Italicize "high confidence"
11	50	55			Replace "unlikely" with "not expected"
11	51	13			Italicize "likely"
11	51	20			Replace "recent" by "past"
11	51	32			Italicize "likely"
11	51	37			Italicize "low confidence"
11	51	45			Replace "higher sensitivity" with "higher transient response"
11	52	1			Change sentence staring with "Confidence…" to read "There is low confidence in this assessment because of uncertainties in aerosol forcing in particular."
11	52	15			Repalce "likely" with "possible"
11	52	24	52	26	Revise sentence to read "Internal variability is included in the CMIP5 projections, but because most of the CMIP5 simulations do not reproduce the observed reduction in global mean surface warming over the last 10 to 15 years, the distribution of CMIP5 near-term trends will not reflect this assessment and might, as a result, be biased low."
11	52	40			Italicize "likely"
11	52	42			Replace "are likely to be" with "*likely* can be"
11	52	45			Italicize "unlikely"
11	52	46			Replace "few" with "two"
11	53	5			Italicize "likely"
11	53	14			Italicize "likely"
11	53	29			Italicize "likely"
11	53	31	53	32	Replace "The temperature scale relative to pre-industrial climate on the right hand side assumes a warming of GMST prior to 1986–2005 of 0.61°C estimated from HadCRUT4" with "The temperature scale on the right hand side shows changes relative to a reference period of 1850-1900, assuming a warming of GMST between 1850-1900 and 1986-2005 of 0.61°C estimated from HadCRUT4". It is also necessary to change the label on the right hand axis of Fig 11.25b.
11	53	45	53	45	Replace "relative to pre-industrial conditions, by this time period (Joshi et al..." with "relative to earlier time periods (Joshi et al, …"
11	53	46	53	46	Delete "as an estimate of pre-industrial climate,"

Chapter	From Page	From Line	To Page	To Line	Edit
11	53	48			Italicize "likely"
11	53	57			Replace "highly likely" with "*very likely*"
11	54	4	54	4	Replace "an estimate of pre-industrial climate" with "the mean temperature in the period 1850-1900"
11	54	5	54	5	Replace "pre-industrial climate" with "the mean temperature in the period 1850-1900"
11	55	31			Replace "not likely" with "probably not the case"
11	55	43			Change "Figure 2.30" to "Figure 2.29"
11	55	53			Replace "ones" with "patterns"
11	55	54			Replace "overconfidence" with "remaining discrepancies"
11	57	5			Insert "strongly" before "influence"
11	120				Revised Figure 11.25 to have italicized "likely"
11	Refs				Add Knutson et al. (2013a): Dynamical Downscaling Projections of Late 21st Century Atlantic Hurricane Activity CMIP3 and CMIP5 Model-based Scenarios. J. Climate, doi:10.1175/JCLI-D-12-00539.1

Chapter 12: Long-term Climate Change: Projections, Commitments and Irreversibility

Chapter	From Page	From Line	To Page	To Line	Edit
12	3	33			insert “12.10,” before “12.39”
12	3	40	3	41	Delete "With respect to preindustrial conditions,"
12	3	42	3	42	Replace "preindustrial" with "1850-1900"
12	3	43	3	43	Replace "preindustrial" with "1850-1900"
12	4	45	3	45	as likely as not -> about as likely as not
12	4	50			Replace "high latitudes are very likely" by "high latitude land masses are likely to experience" to be consistent with chapter
12	5	34			add “for at least 5 consecutive years” after “sea ice extent less than 1 × 106 km2”
12	6	3			Keep first sentence, starting with second replace by: "The strongest ocean warming is projected for the surface in subtropical and tropical regions. At greater depth the warming is projected to be most pronounced in the Southern Ocean. Best estimates of ocean warming in the top one hundred meters are about 0.6°C (RCP2.6) to 2.0°C (RCP8.5), and about 0.3°C (RCP2.6) to 0.6°C (RCP8.5) at a depth of about 1 km by the end of the 21st century. For RCP4.5...."
12	6	10			Replace "12.4.7, Figure 12.12" with "12.4.7, 12.5.2–12.5.4, Figure 12.12"
12	6	14			Replace by "...21st century. There is *low confidence* in assessing the evolution of the AMOC beyond the 21st century. Best estimates and ranges for the reduction from CMIP5 are 11% (1 to 24%) in RCP2.6 and 34% (12 to 54%) in RCP8.5."
12	7	3			Replace "over the entire industrial era" with "since that period"
12	8	13			Remove "likely"
12	13	29			Replace "model mean" with "multi-model mean change"
12	13	33			Insert "change" before "remains"
12	13	45			Figure 1c -> Figure 1b
12	14	1			Figure 1 -> Figure 1c
12	14	9			Figure 1d -> Figure 1c
12	14	12			insert "(Box 12.1, Figure 1e)" after "lack of signal"
12	14	13			delete "(as in (b))"
12	14	16			Figure 1e -> Figure 1d
12	15	14	15	15	Replace last sentence of caption with "39 models are used in all panels."
12	23	30			Remove "and Table 8.1".
12	25	9			Replace "preindustrial" with "1850-1900"
12	25	14			Replace "As for the non-mitigation pathways" with "As for the other pathways"
12	25	14			Replace "preindustrial" with "1850-1900"
12	25	46			Replace "and regional averages are presented in Table 14.8a" by "and regional averages are discussed in Section 14.8.1'".
12	26	3			Replace 'preindustrial' with 'the 1850 to 1900 average'
12	26	15	26	15	Replace 'preindustrial' with 'the 1850 to 1900 average'
12	26	16	26	16	Replace 'preindustrial' with 'the 1850 to 1900 average'

Chapter	From Page	From Line	To Page	To Line	Edit
12	26	16			Insert "and more likely than not to exceed 2°C for RCP4.5 (medium confidence)" after "(high confidence)"
12	26	20	26	20	as likely as not -> about as likely as not
12	26	25			Replace 'preindustrial' with 'the 1850 to 1900 average'
12	28	38			Replace "close to" with "consistent with"
12	30	13			Replace "signal of external forcings" with "response to external forcings"
12	32	22			Replace "and for the constant composition commitment runs at a time of stabilization" with "and for a period of approximate stable temperature"
12	35	51	35	52	Change 'multi model mean' to 'multi model mean change' in both instances
12	36	20			coldest day -> coldest night
12	36	24			coldest day -> coldest night
12	36	26	36	27	Replace "(see Section 12.3.4.1 for a comparison of RCP and SRES scenarios and Seneviratne et al. (2012) for earlier CMIP3 results)" with "(see Seneviratne et al. (2012) for earlier CMIP3 results)"
12	37	56			Add "Supplementary Material" at the end of line
12	38	36			Remove ","
12	38	43			Replace Section 9.4.2, by Box 9.2
12	39	26	39	27	Change 'multi model mean' to 'multi model mean change' in both instances
12	40	1			Figure 12.17-> Figure 12.16
12	40	5	40	6	Figure 12.17-> Figure 12.16
12	40	36	40	37	Change 'multi model mean' to 'multi model mean change' in both instances
12	41	28	41	29	Change 'multi model mean' to 'multi model mean change' in both instances
12	42	4	42	5	Replace sentence with "In summary, poleward shifts in the mid-latitude jets of about 1 to 2 degrees latitude are likely at the end of the 21st century under RCP8.5 in both hemispheres (medium confidence) with weaker shifts in the NH and under lower emission scenarios."
12	42	12	42	13	Change 'multi model mean' to 'multi model mean change' in both instances
12	46	5	46	6	Change 'multi model mean' to 'multi model mean change' in both instances
12	48	54			Change "1985" to "1986"
12	48	55	48	56	Change 'multi model mean' to 'multi model mean change' in both instances
12	50	11	50	12	Change 'multi model mean' to 'multi model mean change' in both instances
12	50	47			Remove "(mm)"
12	50	48	50	49	Change 'multi model mean' to 'multi model mean change' in both instances
12	51	19	51	20	Change 'multi model mean' to 'multi model mean change' in both instances
12	53	35	53	37	Replace both instances of "The average 2081–2100 CMIP5 multi-model" with "The CMIP5 2081–2100 multi-model"
12	54	57			Insert "consequitive" before "years"
12	57	36			Replace 24±7 by 25±8%
12	58	5			after near-surface permafrost add "(see Glossary)"

Chapter	From Page	From Line	To Page	To Line	Edit
12	58	27			Italicize "virtually certain"
12	59	1			Replace "Surface warming varies" by "Sea surface temperature changes vary"
12	59	4	59	5	Replace sentence by: "Best estimates of ocean warming in the top one hundred meters are about 0.6°C (RCP2.6) to 2.0°C (RCP8.5), and about 0.3°C (RCP2.6) to 0.6°C (RCP8.5) at a depth of about 1 km by the end of the 21st century."
12	59	36	59	37	Change 'multi model mean' to 'multi model mean change' in both instances
12	60	1	60	2	Replace sentence starting with "The best estimate…" with "Best estimates and ranges for the reduction from CMIP5 are 11% (1 to 24%) in RCP2.6 and 34% (12 to 54%) in RCP8.5. There is *low confidence* in assessing the evolution of the AMOC beyond the 21st century."
12	68	5			Remove "the RCP2.6 and"
12	72	23			Replace "PgC–1" with "per 1000 PgC"
12	73	18	73	18	Fig. 12.45 panel f: "simulations" -> "simulations (Gillett et al., 2013)"
12	73	55	73	55	after the bracket add ", but without considering the CMIP based evidence,"
12	74	33	74	33	After "high confidence." add: "The combined evidence increase the confidence in this final assessment compared to that of the observed warming and paleoclimate only."
12	75	19			Replace "12.5.3.1" by "12.5.3":
12	76	8			Replace "pathway" with "evolution"
12	77	14	77	18	Replace sentence starting with "Based on…" with "Based on the assessment of TCRE (assuming a normal distribution with a ±1 standard deviation range of 0.8-2.5°C per 1000 PgC), limiting the warming caused by anthropogenic CO2 emissions alone (i.e., ignoring other radiative forcings) to less than 2°C since the period 1861–1880 with a probability of >33%, >50% and >66%, total CO2 emissions from all anthropogenic sources would need to be below a cumulative budget of about 1570 PgC, 1210 PgC and 1000 PgC since 1870, respectively. An amount of 515 [445 to 585] PgC was emitted between 1870 and 2011."
12	77	17			Replace "460 to 630 PgC" with "445 to 585 PgC"
12	77	21			Insert "When accounting for the non-CO2 forcings as in the RCP scenarios, compatible carbon emissions since 1870 are reduced to about 900 PgC, 820 PgC and 790 PgC to limit warming to less than 2°C since the period 1861–1880 with a probability of >33%, >50%, and >66%, respectively. These estimates were derived by computing the fraction of CMIP5 ESMs and EMICs that stay below 2°C for given cumulative emissions following RCP8.5, as shown in TFE.8 Fig. 1c. The non-CO2 forcing in RCP8.5 is higher than in RCP2.6. Because all likelihood statements in calibrated IPCC language are open intervals, the provided estimates are thus both conservative and consistent choices valid for non-CO2 forcings across all RCP scenarios. To limit warming to 2°C with >33% or >50% probability, there is no RCP scenario available for direct comparison. To limit warming to below 2°C with >66% probability, RCP2.6 can be used as a comparison. Combining the average back-calculated fossil fuel carbon emissions for RCP2.6 between 2012 and 2100 (270 PgC) with the average historical estimate of 515 PgC gives a total of 785 PgC, i.e. 790 PgC when rounded to 10 PgC. As the 785 PgC estimate excludes an explicit assessment of future land-use change emissions, the 790 PgC value remains a conservative estimate consistent with the overall likelihood assessment. The ranges of emissions for these three likelihoods based on the RCP scenarios are rather narrow, as they are based on a single scenario and on the limited sample of models available (TFE.8 Fig. 1c). In contrast to TCRE it does not include observational constraints or account for sources of uncertainty not sampled by the models." before "temperature target."
12	79	16			Replace by: "preindustrial values. Best estimates and ranges for the reduction from CMIP5 are 11% (1 to 24%) in RCP2.6 and 34% (12 to 54%) in RCP8.5 (Weaver…".
12	79	19			Replace "m^{-3}" with "m^{3}"
12	79	28			Replace paragraph by: "It is unlikely that the AMOC will collapse beyond the end of the 21st century for the scenarios considered but a collapse beyond the 21st century for large sustained warming cannot be excluded.There is low confidence in assessing the evolution of the AMOC beyond the 21st century. Two of the CMIP5 models revealed an eventual slowdown of the AMOC to an off state (Figure 12.35). But this did not occur abruptly."
12	83	2			Replace "sections 5.5.2.4 and 5.6.2" by "Section 5.5.5"
12	83	41			Replace 8.7 by 8.6
12	85	29			for three -> for two

Chapter	From Page	From Line	To Page	To Line	Edit
12	85	49			for three -> for two
12	86	50			in the tropics -> in parts of the deep tropics
12	88	26			Replace "About 20%" with "About 15 to 40%"
12	135				where 90% -> where at least 90%
12	136				Fig. 12.12 replaced to fix a minor issue in the ocean data of one model
12	136				Updated ocean part ot Fig. 12.12 to fix a minor data problem in one model.
12	136				where 90% -> where at least 90%
12	139				Figure 12.15: title revised
12	158				where 90% -> where at least 90%

Chapter 13: Sea Level Change

Chapter	From Page	From Line	To Page	To Line	Edit
13	2	15			Change to "13.6.5 Regional Relative Sea Level Changes"
13	3	4	3	5	Revise to: “because of the improved physical understanding of the components of sea level, the improved agreement of process-based models with observations, and the inclusion of ice-sheet dynamical changes.”
13	3	11	3	11	insert “has” before “exceeded”; Insert "mean" before temperature
13	3	12	3	16	Replace "During the last interglacial…" with "There is very high confidence that maximum global mean sea level during the last interglacial period (129,000 to 116,000 years ago) was, for several thousand years, at least 5 m higher than present and high confidence that it did not exceed 10 m above present, implying substantial contributions from the Greenland and Antarctic ice sheets. [5.6.2, 13.2.1] This change in sea level occurred in the context of different orbital forcing and with high-latitude surface temperature, averaged over several thousand years, at least 2°C warmer than present (high confidence). [5.3.4]"
13	3	18	3	20	Replace with: Proxy and instrumental sea level data indicate a transition in the late 19th to the early 20th century from relatively low mean rates of rise over the previous two millennia to higher rates of rise (high confidence). It is likely that the rate of global mean sea level rise has continued to increase since the early 20th century {3.7, 3.7.4, 12 5.6, 13.2}
13	3	18			insert “sea level” after “instrumental”
13	3	20	3	20	Append "with estimates that range from 0.000 [–0.002 to 0.002] mm yr–2 to 0.013 [0.007 to 0.019] mm yr-2." to end of new sentence in trickleback correction.
13	3	21	3	21	insert “global” before “mean”
13	3	23	3	23	Change 1930 to 1920
13	3	30	3	31	Change "(excluding the glaciers in Antarctica)" to "(excluding Antarctic glaciers peripheral to the ice sheet)"
13	3	39	3	41	Reword first sentence to “There is high confidence in projections of thermal expansion, high confidence in projections of and Greenland surface mass balance, and medium confidence in projections of glacier mass loss, Antarctic and surface mass balance.”
13	3	44	3	44	insert “of these contributions” after “observational estimates”
13	3	47	3	47	insert "marine-based sectors of" before "the Antarctic ice sheet"
13	3	47	4	1	change “Alternative means of projection” to “Alternative means of projection of the Antarctic Ice Sheet contribution”
13	4	3	4	3	change “marine-sectors of the ice sheet” to “marine-based sectors of the Antarctic Ice Sheet”
13	4	9	4	9	insert “peripheral” after “Greenland”
13	4	11	4	12	Delete "In all periods, the residual is small enough to be attributed to the ice sheets."
13	4	13	4	13	change 1990 to 1993
13	4	13	4	13	insert “global mean sea level” after “greater rate of”
13	4	20	4	20	delete “very likely”
13	4	21	4	21	insert “(high confidence)” after “uncertainties”
13	4	29	4	29	Insert "Projections of sea level rise are larger than in the AR4, primarily because of improved modeling of land-ice contributions." before "For the period..."
13	4	30	4	30	insert “projections from” after “5-95% range of”
13	4	30	4	32	Change to “0.26–0.55 m for RCP2.6, 0.32–0.63 m for RCP4.5, 0.33–0.63 m for RCP6.0, and 0.45–0.82 m for RCP8.5.” i.e. add 0.01 m to the upper numbers.
13	4	32	4	32	Change 0.53–0.97 to 0.52–0.98. Change 7–15 to 8–16.
13	4	36	4	36	insert "assessed" before "likely" and italicize "likely"
13	4	44	4	46	replace sentence starting with “Despite their successful calibration…” with “Despite the successful calibration and evaluation of semi-empirical models against the

Chapter	From Page	From Line	To Page	To Line	Edit
					observed 20th century sea level record, there is low agreement and no consensus in the scientific community about their reliability, and consequently low confidence in projections based on them [13.5.2-3; Figure 13.12]."
13	4	49	4	49	insert "The amount of" at beginning of sentence now starting with "Longer term…"
13	4	50	4	52	replace with: The few available model results that go beyond 2100 indicate global mean sea level rise above the pre-industrial level by 2300 to be less than 1 m for a radiative forcing that corresponds to CO2 concentrations that peak and decline and remain below 500 ppm, as in the scenario RCP2.6. For a radiative forcing that corresponds to a CO2 concentration that is above 700 ppm but below 1500 ppm, as in the scenario RCP8.5, the projected rise is 1 m to more than 3 m (medium confidence). {13.5}
13	4	52	4	52	Insert the following sentence before "The amount…": "This assessment is based on *medium confidence* in the modelled contribution from thermal expansion and *low confidence* in the modelled contribution from ice sheets."
13	4	53	4	53	insert "rate of the" after "but the"
13	4	54	4	54	change 0.43 to 0.41
13	4	54	4	55	Replace sentence starting with "The contribution from…" with "Sea level rise of several meters could result from long-term mass loss by ice sheets (consistent with paleo data observations of higher sea levels during periods of warmer temperatures), but there is low *confidence* in these projections."
13	5	2	5	2	insert "above preindustrial" after "certain threshold"
13	5	2	5	2	insert "sustained" after "indicates that"
13	5	5	5	5	insert "(*medium confidence*)" after "4oC"
13	5	6	5	6	insert low *confidence*)" after "1oC"
13	5	8	5	8	Insert "Abrupt and irreversible ice loss from a potential instability of marine-based sectors of the Antarctic ice sheet in response to climate forcing is possible, but current evidence and understanding is insufficient to make a quantitative assessment." after "threshold."
13	5	8			Change "[13.4.3.3]" to "[13.4.3, 13.4.4]"
13	5	17	5	17	add "that will" after "most regions" and change "experiencing" to "experience"
13	5	18			Insert "relative" before "sea level"
13	5	19			change "13.20" to "13.22"
13	5	23	5	24	Revised sentence to read "It is very likely that there will be a significant increase in the occurrence of future sea level extremes in some regions by 2100, with a likely increase in the early 21st century."
13	7	21			change "13.7" to "13.6"
13	7	46	7	46	change "deep-ocean" to "open-ocean"
13	8	33	8	33	change "(See they are discussed…)" to "(see discussion…)"
13	9	11	9	11	insert "one that is" after "or"
13	9	19	9	19	change 13.1.5.1 to 13.1.4.1
13	9	44	9	44	change "are likely to" to "may"
13	9	46	9	46	delete "and the projections."
13	10	13	10	13	change "(the World Glacier Inventory contains more than 181,500...)" to "(the Randolph Glacier Inventory contains more than 170,000)"
13	10	28	10	29	change "through better understanding of and accounting for the" to "through better accounting of the"
13	11	3	11	8	Simplify first two sentences to "New data syntheses and model simulations since the AR4 indicate that during the Last Interglacial Period (LIG, ~129 to 116 ka), global mean annual temperature was 1°C-2°C warmer than pre-industrial (*medium confidence*) with peak global annual sea surface temperatures (SSTs) that were

Chapter	From Page	From Line	To Page	To Line	Edit
					0.7°C ± 0.6°C warmer (*medium confidence*) (Section 5.3.4)." Insert an additional sentence "High latitude surface temperature, averaged over several thousand years, was at lest 2°C warmer than present (*high confidence*)." and modify the next sentence to "There is robust evidence and high agreement that under the different orbital forcing and warmer climate of the LIG, sea level was higher than present."
13	11	43	11	43	replace “an acceleration that marks the” with “a”
13	11	46	11	46	replace “acceleration” with “increase”
13	11	48	11	48	delete “CE”
13	11	53	11	53	insert “by subtracting the long-term trend (Gehrels and Woodworth, 2013)” after “from these records”
13	12	1	12	1	insert "Ordinate axis on the left corresponds to the paleo sea level data. Ordinate axis on the right corresponds to tide gauge data."
13	12	3			delete “(1900-2010)”
13	12	6	12	6	change 13.7 to 3.7
13	12	16	12	16	change 13.3b to 13.3b and c
13	12	17	12	17	change 13.3c to 13.3d
13	12	28	12	28	change 1900 to 1901
13	12	35	12	35	change "it is virtually certain" to "there is high confidence"
13	12	35	12	35	change “accelerated” to “increased”
13	12	35	12	35	delete “global mean”
13	12	36	12	36	insert “and it is *likely* that GMSL has accelerated since the early 1900’s.” after “two centuries”
13	12	40			Remove "(90% confidence)"
13	12	42			Remove "(90% confidence)"
13	12	57	12	58	replace first part of sentence starting with “Chapter 3 concluded…” with “Chapter 3 concluded that the GMSL trend since 1993 is *very likely* higher compared to the mean rates over the 20th century, and it is…”
13	13	1	13	1	insert “recent” before “higher rate”
13	13	23	13	23	insert “may also” before “cause vertical motion”
13	13	26	13	28	Revise two sentences starting with "Since the 1970s, satellites have measured the height of the ocean surface relative…" to be one sentence "Since the 1970s, satellite measurements of the height of the ocean surface relative to the center of the Earth (known as geocentric sea level) show differing rates of geocentric sea level rise around the world (see FAQ 13.1, Figure 1)."
13	13	27			Change "rise" to "change"
13	14	56	14	56	change "systematic depth-varying biases" to "systematic time-dependent depth biases"
13	14	58	14	58	insert "Project" after "Argo"
13	15	8			replace “(Figure 13.4a)” with “(Table 13.1)”
13	15	9	15	10	revise “(Section 3.7.2 and Table 3.1).” to “(Section 3.7.2, Table 3.1, Table 13.1).”
13	15	17	15	17	change 9.7.2.3 to 9.7.2.5
13	16	27	16	27	reword “GRACE space gravity observations” to “gravity observations from GRACE satellites”
13	16				added a new footnote to Table 13.1 that will now be “a” so that other two footnotes (former “a” and “b”) are changed to “b” and “c”. The new footnote “a” goes after “Glaciers except in Greenland and Antarctica” and reads: “Data for glaciers extend only to 2009, not 2010.”

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13	16				Footnote "b" (formerly "a") is moved to last column after 0.10 [0.07 to 0.13]
13	17	8	17	8	change "to losses from the ice sheets plus their peripheral glaciers" to "to losses from the ice sheets including their peripheral glaciers"
13	17	9	17	11	reword as (this also includes a couple of corrections to some numbers) "…of the two ice sheets was 0.54 [0.48-0.61] mm yr^{-1} SLE for 1901-1990, 0.62 [0.25-1.00] mm yr^{-1} SLE for 1971-2009, 0.76 [0.39-1.13] mm yr^{-1} SLE for 1993-2009, and 0.83 [0.46-1.20] mm yr^{-1} SLE for 2005-2009 (Section 4.3.3.4)."
13	17	11			insert ", Table 13.1" after "4.3.3.4"
13	17	31	17	31	change 13d to 13.4d
13	17	52	17	53	change "the mass balance, volumetric, and gravimetric methods (Section 4.4.1)" to "the mass budget method, repeat altimetry, and gravimetric methods that measure temporal variations in the Earth's gravity field (Section 4.4.2)."
13	17	57	17	57	change 4.4.2.2 to 4.4.3
13	18	2	18	2	change 4.4.2. to 4.4.3
13	18	40	18	40	delete (Figure 13.5)
13	18	48	18	48	replace 14.7.2 with 14.8.2
13	18	57	18	57	replace "that is one standard deviation of annual values" with "(1 standard deviations of annual mean values indicated)"
13	20	13	20	13	replace 14.7.14 with 14.8.15
13	20	29	20	29	delete "large"
13	21	12	21	13	replace sentence starting with "The net contribution for the 20th century…" with this: "The net contribution for the 20th century is estimated by adding the average of the two groundwater depletion estimates to the reservoir storage term (Figure 13.4c). The trends are -0.11 [-0.16 to -0.06] mm yr^{-1} for 1901-1990, 0.12 [0.03 to 0.22] mm yr^{-1} for 1971 to 2010 and 0.38 [0.26 to 0.49] mm yr^{-1} for 1993 to 2010."
13	22	5	22	5	insert "(*high confidence*)" after "contributions"
13	22	19	22	19	insert "(*high confidence*)" after "GMSL"
13	22	26	22	26	change 13.3.2.2 to 13.3.3.2
13	22	39	22	39	insert "(*high confidence*)" after "1993-2010"
13	22	40	22	40	change 13.3.2.2 to 13.3.3.2
13	22	51	22	51	insert "for the 20th century" after "observed GMSL rise"
13	23	2	23	2	insert "(*medium confidence*)" after "oscillation"
13	23	10	23	10	change 13.1.5.1 to 13.1.4.1
13	23	11	23	11	change 13.3.2.2 to 13.3.3.2
13	23	18	23	33	Revise caption to Figure 13.7: (a) The observed and modelled sea level for 1900 to 2010. (b) The rates of sea level change for the same period, with the satellite altimeter data shown as a red dot for the rate. (c) The observed and modelled sea level for 1961 to 2010. (d) The observed and modelled sea level for 1990 to 2010. Panel (e) compares the sum of the observed contributions (orange) and the observed sea level from the satellite altimeter data (red). The estimates of global mean sea level are from Jevrejeva et al. (2008), Church and White (2011), and Ray and Douglas (2011), with the shading indicating the uncertainty estimates (two standard deviations). The satellite altimeter data since 1993 are shown in red. The grey lines in panels (a)-(d) are the sums of the contributions from modelled ocean thermal expansion and glaciers (excluding glaciers peripheral to the Antarctic ice sheet; from Marzeion et al., 2012a), plus changes in land-water storage (see Figure 13.4). The black line is the mean of the grey lines plus a correction of thermal expansion for the omission of volcanic forcing in the AOGCM control experiments (see Section 13.3.1.2). The dashed black line (adjusted model mean) is the sum of the corrected model mean thermal expansion, the change in land-water storage, the Marzeion et al. (2012a) glacier estimate using observed (rather than modelled) climate (see Figure 13.4), and an illustrative long-term ice-sheet contribution (of 0.1 mm yr–1). The dotted black line is the adjusted model mean but now including the observed ice-sheet contributions, which begin in 1993. Because the observational ice-sheet estimates include the glaciers peripheral to the Greenland and Antarctic ice sheets (from Section 4.4), the contribution from

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					glaciers to the adjusted model mean excludes the peripheral glaciers to avoid double counting. (Figure and caption updated from Church et al., 2013).
13	23	54	23	54	change 13.4 to 13.3.1
13	24	16	24	16	change to: "...energy inflow (Box 13.1, Figure 1a). From 1971 to 2010, the total energy inflow (relative to the reference period 1860-1879) is estimated to be 790 [105 to 1,370] ZJ (1 ZJ = 10^{21} J)."
13	24	29			Italicize "likely"
13	24	37	24	37	change "Section 13.4.2.2.6" to "Sections 13.3.1, 13.3.6"
13	24	37	24	37	change 1970 to 1971
13	24	39	24	39	change to "and warm the atmosphere. The estimated increase in energy in the Earth system between 1971 and 2010 is 274 [196 to 351] ZJ (Box 3.1)."
13	25	8	25	8	change 2 to 1.5
13	25	8	25	8	insert "*likely*" before "range of climate…"
13	25	9	25	9	insert "(*high confidence*)" after "uncertainties"
13	25	22	25	22	replace "in" with "for the ensemble of"
13	26	11	26	12	change "depends on the pathway of CO2 emissions, not only on the cumulative total" to "depends not only on the cumulative total, but also on the pathway of CO2 emissions"
13	26	45	26	45	replace "reach up to" with "exceed"
13	26	54	26	54	change 0.38 to 0.42
13	26	55	26	55	insert "a thermal expansion of 0.38 m $^{o}C^{-1}$ that would result from" after "consistent with"
13	27	24	27	24	change "losses" to "changes" and insert "(Table 13.1)" after "changes"
13	27	26	27	28	Reword as: "The peripheral glaciers surrounding both the Greenland and Antarctic ice sheets are thus included in the process-based models described above, but for projections shown in Table 13.5, the Antarctic peripheral glaciers are included with the Antarctic Ice Sheet whereas the Greenland peripheral glaciers are included with the remaining world's glaciers."
13	27	49	27	50	delete "conventional" and the quotation marks around process-based
13	28				Table 13.3: in second row, add "PG" after "Antarctic Ice Sheet".
13	28				Table 13.3: in third row, "Processed-based" change to "Process-based"
13	28				Table 13.3: under heading "Scenario A1B and RCP4.5", numbers "0.06–0.11" change to "0.006-0.011"
13	28				Table 13.3: under heading "Scenario A1B", numbers "0.04–0.21" change to "0.004-0.021"
13	29	1	29	2	insert "Notes (a) This projection represents changes in Greenland peripheral glaciers only, and is not included in the global glacier summaries.
13	29	15	29	15	change "734,400" to "about 734,000"
13	29	15	29	15	change "exclusive of the" to "exclusive of that peripheral to the"
13	29	15			change "287,300" to "280,500"
13	29	16	29	16	delete "is now known to" and change "drain" to "drains"
13	29	23	29	23	change "are unknown" to "do not exist"
13	29	37	29	37	change "is very unlikely to" to "probably will not"

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13	29	39	29	39	change “depleted” to “intercepted”
13	29	58	29	58	change 13.1.5.1 to 13.1.4.1
13	31	44	31	44	insert “as the ice-sheet surface lowers” after "amount of melting"
13	31	44	31	44	replace “This feedback” with “This SMB-surface elevation feedback”
13	33	34	33	34	change "the upper limit of the likely 5–95% model range" to "the upper limit of the likely range"
13	33	35	33	35	insert “for the year 2100” after “RCP scenarios”
13	33	44	33	44	change “compete to” to “each”
13	33	44	33	44	insert “by not including surface melt,” after “implying that”
13	33	45	33	45	insert “by dynamics” after “mass loss”
13	33	48	33	48	change "the lower limit of the likely 5–95% model range" to "the lower limit of the likely range"
13	33	57			delete "Nowicki et al. (2013)"
13	34	31			delete "Nowicki et al. (2013)"
13	34	40	34	40	insert “by year 2100” after “all other scenarios”
13	34	44	34	44	replace “0 to 11 mm” with “0 to 14 mm by year 2100” and delete “in Table 13.5”
13	35	1	35	1	insert “and beyond” after “al. 2013)”
13	35	13	35	13	insert “(Hill et al., 2010)” after “Greenland”
13	35	49	35	49	replace “light” with “context”
13	36	5	36	5	change 5.6.2.4 to 5.6.2.3
13	36	7	36	7	replace “3 m” with “~4 m”
13	36	12	36	12	insert "(and therefore *low confidence*)" after "the one study"
13	36	14	36	14	insert "(*medium confidence* because of multiple studies)" after "about 4oC"
13	36	57	36	57	change 10.3.3.5 to 10.3.3.3
13	37	8	37	8	delete "until the year 2200"
13	37	27	37	27	delete “similar”
13	38	31	38	31	insert a period after “outflow” and then insert “These may operate” before “directly”
13	38	40	38	40	delete “Antarctic" and replace "Peninsula” with "peninsula"
13	39	26	39	26	change "moderate" to "medium", and delete "very"
13	40	11	40	12	reword as “Our assessment of the likely (17 to 83%) range of SLR is based on the weighted 5-95% range (-20 to 185 mm) of Little et al. (2013), which is consistent with the lower…”
13	40	27	40	27	change "9" to "5"
13	41	21	41	21	insert "(the underlying probability distribution is asymmetric towards larger rise)" after "are possible"
13	41	48	41	48	replace "likely" with "possible"
13	42	16	42	19	replace this paragraph with: “In summary, ice-dynamics theory, numerical simulations, and paleo records indicate that the existence of a marine-ice sheet instability

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					associated with abrupt and irreversible ice loss from the Antarctic Ice Sheet is possible in response to climate forcing. However, theoretical considerations, current observations, numerical models, and paleo records currently do not allow a quantification of the timing of the onset of such an instability or of the magnitude of its multi-century contribution."
13	43	53			change "17 to 83% probability range" to "66 to 100% probability level"
13	43	53			insert "(2081-2100 with respect to 1986-2005)" after century
13	44	48	44	48	replace "140 mm" with "185 mm" and insert "by year 2100" after "sea level rise"
13	45	11	45	11	insert "in 2081-2100 (relative to 1986-2005)" after "sea level rise"
13	45	12	45	12	insert "(Table 13.5)" after "70 mm"
13	45	23	45	35	Replace with "FAQ 13.2, Figure 1: Illustrative synthesis of projected changes in SMB and outflow by 2100 for (a) Greenland and (b) Antarctic ice sheets. Colours shown on the maps refer to projected SMB change between the start and end of the 21st century using the RACMO2 regional atmospheric climate model under future warming scenarios A1B (Antarctic) and RCP4.5 (Greenland). For Greenland, average equilibrium line locations during both these time periods are shown in purple and green, respectively. Ice sheet margins and grounding lines are shown as black lines, as are ice sheet sectors. For Greenland, results of flow-line modelling for four major outlet glaciers are shown as inserts, while for Antarctica the coloured rings reflect projected change in outflow based on a probabilistic extrapolation of observed trends. The outer and inner radius of each ring indicate the 17th and 83rd percentiles of the contribution, respectively (scale in upper right); red refers to mass loss (sea level rise) while blue refers to mass gain (sea level fall). Finally, the sea level contribution is shown for each ice sheet (insert located above maps) with light grey referring to SMB (model experiment used to generate the SMB map is shown as a dashed line) and dark grey to outflow. All projections refer to the 17 to G16983% probability range across all scenarios."
13	45	45	45	46	delete ", 90% confidence"
13	46	30	46	30	insert "(note that glaciers on Antarctica are covered by the Antarctic ice-sheet SMB projection, and are therefore not included in the glacier projections)" after "components"
13	46	44	46	45	Replace "(Greenland ... by 2100." with "our assessment of the literature provides a 5-95% range for the late 21st century (2100 for Greenland and Antarctic ice-sheet dynamics, 2081-2100 for land water storage)."
13	46	47	46	47	Replace "2100" with "the late 21st century" - Peter, suggest not do this change
13	47	3	47	3	Replace 0.2 with 0.25
13	47	4	47	4	Replace RCP2.6 with 0.40 [0.26–0.55] m. Replace RCP8.5 with 0.63 [0.45–0.82] m.
13	47	5	47	5	Replace RCP4.5 with 0.47 [0.32–0.63] m and RCP6.0 with 0.48 [0.33–0.63] m.
13	47	7	47	8	Replace the ranges with "0.44 [0.28–0.61] m (RCP2.6), 0.53 [0.36–0.71] m (RCP4.5), 0.55 [0.38–0.73] m (RCP6.0), and 0.74 [0.52–0.98] m (RCP8.5)"
13	47	17	47	17	Replace the rate range with 11 [8–16] mm yr^{-1}
13	47	21	47	21	change "of the present glacier volume" to "of the present volume of glaciers outside Antarctica"
13	47	21	47	21	insert ", accounting for 15-35% of the projections." after "Glaciers are the next largest"
13	47	22	47	22	insert "(Table 13.SM.2)" after "RCP8.5"
13	47	23	47	23	change 13.3.3.2 to 13.4.3.1
13	47	33	47	33	change "rapid dynamics" to "rapid dynamical change"
13	48	21	48	21	change 13.1.5.1 to 13.1.4.1 and delete 13.3.3.2
13	48				For Table 13.5, Replace the "land water storage" line with 0.04 [-0.01 to 0.09] 0.04 [-0.01 to 0.09] 0.04 [-0.01 to 0.09] 0.04 [-0.01 to 0.09] 0.04 [-0.01 to 0.09] Replace the "Sea Level Rise in 2081-2100" with 0.52 [0.37 to 0.69] 0.40 [0.26 to 0.55] 0.47 [0.32 to 0.63] 0.48 [0.33 to 0.63] 0.63 [0.45 to 0.82] Replace the "Rate of Sea Level Rise" with

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					8.1 [5.1 to 11.4] 4.4 [2.0 to 6.8] 6.1 [3.5 to 8.8] 7.4 [4.7 to 10.3] 11.2 [7.5 to 15.7] Replace the “Sea Level Rise in 2046-2065” with 0.27 [0.19 to 0.34] 0.24 [0.17 to 0.32] 0.26 [0.19 to 0.33] 0.25 [0.18 to 0.32] 0.30 [0.22 to 0.38] Replace the “Sea Level Rise” in 2100 with 0.60 [0.42 to 0.80] 0.44 [0.28 to 0.61] 0.53 [0.36 to 0.71] 0.55 [0.38 to 0.73] 0.74 [0.52 to 0.98]
13	49	14			insert “Median and” at beginning of caption, and make “range” lower case “r” -> “Median and range (5 to 95%)…”
13	50				Table 13.6. Replace the IPCC AR5 SRES A1B line, currently “0.40 0.58 0.78”, with “0.42 0.60 0.80”
13	51				Table 13.6. Replace the IPCC AR5 RCP4.5 line, currently “0.32 0.47 0.62”, with “0.32 0.47 0.63”
13	53	26	53	26	change “0.95 m” to “0.98 m”
13	54	5	54	5	Change “[0.41–0.79]” to “[0.42–0.80]”
13	54	6	54	6	Change “[0.40–0.75]” to “[0.40–0.76]”
13	54	45	54	45	change 13.5.4.3 to 13.5.4.2
13	55	13			Figure 13.13: Sea level projections beyond the year 2100 are grouped into three categories according to the concentration of GHG concentration (in CO2-eq) in the year 2100 (upper panel: >700 ppm including RCP6.0 and RCP8.5; middle panel: 500–700 ppm including RCP4.5; lower panel: <500 ppm including RCP2.6). Colored bars show the full model spread. Horizontal lines provide the specific model simulations. The different contributions are given from left to right as thermal expansion from the CMIP5 simulations up to 2300 (as used for the 21st century projections, section 13.5.1, light blue, with the median indicated by the horizontal bar), thermal expansion for the models considered in this section (dark blue), glaciers (light green), Greenland Ice Sheet (dark green), Antarctic Ice Sheet (orange), and the total contribution (red). The range provided for the total sea level change represents the maximum possible spread that can be obtained from the four different contributions. Light red-shaded bars show the likely range for the 21st century total sea level projection of the corresponding scenarios from Figure 13.10 with the median as the horizontal line. In the upper panel, the left light red bar corresponds to RCP6.0 and the right light red bar corresponds to RCP8.5.
13	55	14	55	22	Replace caption for Figure 13.13 with:
13	55	32	55	33	reorganize sentence as follows: “It should be noted that except for the glacier models (Section 13.4.2), the models used here for the period beyond 2100 are different from the models used for the 21st century (Sections 13.4.1, 13.4.3, 13.4.4, and 13.5.1).”
13	55	36	55	37	replace “are similar to” with “cover the range of”
13	55	37	55	37	change 13.10 to 13.13
13	56	7	56	7	change 13.5.4.3 to 13.5.4.2
13	56	44	56	55	Replace UCL with "Loch-Vecode-Ecbilt-CLio-agIsm Model(LOVECLIM)"
13	57	8			insert “current Antarctic” before “ice-sheet”
13	58	15	58	16	change "confidence of the ice-sheet models’ ability to project dynamic ice-discharge from Greenland and Antarctica is low which is likely to result" to "there is low confidence in the ice-sheet models' ability to project rapid dynamical change in the Greenland and Antarctic ice sheets, which may result"
13	58	16			delete “Greenland and” and change “sheets” to “sheet”
13	59	25	59	25	change "Japan Sea" to "region between Japan and Korea"
13	59	56			Change "2012b" to "2012"
13	60	21	60	21	add the following to end of figure caption: "Note that the global mean is different from the value in Table 13.5, by less than 0.01 m, because a slightly different set of CMIP5 models was used (see the Supplementary Material)."
13	60	45	60	45	insert “(Section 12.4.4)” after “several degrees latitude”
13	60	54	60	54	Change 0.01 to 0.005.
13	62	2	62	2	change 13.18 to 13.18a

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13	62	11			first line of section: change to “Regional relative sea level”
13	62	15			change to “decades, regional relative sea level”
13	62	38			change "mean net regional" to "mean regional relative"
13	62	42			change "mean net regional" to "mean regional relative"
13	62	45	62	49	Replace with "Figure 13.19: (a) Ensemble mean net regional sea level change (m) evaluated from 21 models of the CMIP5 scenario RCP 4.5, including atmospheric loading, plus land-ice, GIA and terrestrial water sources, between 1986–2005 and 2081–2100. Global mean is 0.48 m, with a total range of -1.74 to +0.71 m. (b) The local, lower 90% uncertainty bound (p=0.05) for RCP4.5 scenario sea level rise (plus non-scenario components). (c) The local, upper 90% uncertainty bound (p=0.95) for RCP4.5 scenario sea level rise (plus non-scenario components). Note that the global mean is different from the value in Table 13.5, by less than 0.01 m, because a slightly different set of CMIP5 models was used (see the Supplementary Material) and that panels (b) and (c) contain local uncertainties not present in global uncertainties."
13	62	56			change "regional sea level" to "regional relative sea level"
13	62	57	62	57	add “that will” after “regions” and change “experiencing” to “experience”
13	63	3	63	3	delete “very”
13	63	20			change "most" to "many"
13	63	21	63	23	Change sentence starting with "In general…" to "In general, changes along the coastlines will range from about 30 cm to 55 cm for an RCP 4.5 scenario, peaking near 50 cm, and from about 40 cm to more than 80 cm under a RCP 8.5 scenario, peaking near 65 cm."
13	63	23			Insert "relative" before "sea level"
13	63	39	63	40	change 0.53 [0.34-0.74] to 0.52 [0.35-0.70]
13	64	8	64	10	Reword this sentence to "Moreover, the spread in ocean heat uptake efficiency among models is responsible for 50% of the spread in heat uptake (Kuhlbrodt and Gregory, 2012)."
13	64	54	64	54	change 13.15 to 13.24
13	66	10			insert "(with respect to mean sea level" after "height"
13	66	16			insert "(with respect to mean sea level)" after "0.1 m"
13	66	30	66	32	Replace “…the effect of MSL rise…than the present values” with: “the effect of MSL rise added linearly to the simulated surges. However, in the regions of moderate surges (2–3 m), particularly in wetland-fronted areas, the increase in surge height was 1–3 m larger than the increase in mean sea level rise.”
13	66	42	66	42	insert “(Figure 13.25b)” after “here”
13	66	42	66	42	replace “The above” with “These”
13	66	49	66	49	insert “similar or” after “found to be”
13	66	50	66	50	replace “However” with “Specifically”
13	66	51	66	51	insert "and/or in regions of large uncertainty (e.g. in regions near the former Laurentide Ice Sheet where the GIA uncertainty is large)," after "…sea level rise)"
13	66	56	67	3	revise as: "Using projected time series of tides, MSL rise, components of sea level fluctuations from projected MSLP and wind stress fields, and a contribution for ENSO variability through projected SSTs for the 21st century, Cayan et al. (2008) showed that for high-end scenarios of MSL rise, the frequency and magnitude of extremes along the California coast increases considerably relative to those experienced in the 20th century.”
13	67	4	67	4	insert: “In summary, dynamical and statistical methods on regional scales show that it is *very likely* that there will be an increase in the occurrence of future extreme sea level in some regions by 2100, with a *likely* increase in the early 21st century. The combined effects of MSL rise and changes in storminess will affect future extremes. There is *high confidence* that extremes will increase with MSL rise yet there is *low confidence* in region-specific projections in storminess and storm surges.”
13	67	8	67	9	delete sentence starting with “The Gumbel scale parameters…”

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13	68	11	68	11	replace “is expected” with “is *very likely*”
13	69	38	69	38	insert “it is *very likely* that” after “and”
13	69	39	69	39	insert “(*medium confidence*)” after “*likely*”
13	69	55	69	55	delete "sea level"
13	73	24			replace "Wildon" with "Wilson"
13	99		99		Update figure with updated radiative forcings and their uncertainties
13	101		101		Update figure to account for error in time series plot
13	104		104		Update figure with corrected projections and revised legend ("rapid dynamics" changed to "rapid dynamical change")
13	105		105		Update figure with corrected projections
13	106		106		Update figure with corrected projections
13	112		112		Update figure with average GIA estimate
13	113		113		Update figure with corrected projections and average GIA estimate
13	113				Caption Fig. 13.19: change "mean net regional" to "mean regional relative"
13	114		114		Update figure with corrected projections and average GIA estimate
13	114				Caption Fig. 13.20: change "mean net regional" to "mean regional relative"
13	115		115		Update figure with corrected projections and average GIA estimate
13	115				Caption Fig. 13.21: change "mean net regional" to "mean regional relative"
13	116		116		Update figure with corrected projections and average GIA estimate
13	116				Caption Fig. 13.22: change "mean net regional" to "mean regional relative"
13	117		117		Update figure with corrected projections and average GIA estimate
13	117				Caption Fig. 13.23: remove "net"
13	119		119		Update figure with corrected projections and average GIA estimate
13	121		121		Update figure with corrected projections
13	13-SM-2	7			Append: The data files are named as follows: scenario _ quantity statistic . suffix for instance rcp45_summid.nc. In each name, scenario is rcp26, rcp45, rcp60 or rcp85, corresponding to the four representative concentration pathways used in CMIP5. quantity is temperature for global mean surface temperature change, expansion for thermal expansion (sections 13.4.1 and 13.SM.1.2), glacier for glaciers (13.4.2 and 13.SM.1.3), greensmb for Greenland ice-sheet SMB (13.4.3.1 and 13.SM.1.4), antsmb for Antarctic ice-sheet SMB (13.4.4.1 and 13.SM.1.5), greendyn for Greenland ice-sheet rapid dynamical change (13.4.3.2 and 13.SM.1.6), antdyn for Antarctic ice-sheet rapid dynamical change (13.4.4.2 and 13.SM.1.6), landwater for anthropogenic intervention in water storage on land (13.4.5 and 13.SM.1.6), greennet for the sum of SMB and rapid dynamical contributions from the Greenland ice-sheet, antnet for the sum of SMB and rapid dynamical contributions from the Antarctic ice-sheet, sheetdyn for the sum of the rapid dynamical contributions from the Greenland and Antarctic ice-sheets, or sum for the sea level projection including all contributions. Except for temperature, these are the quantities shown in Table 13.5. statistic is mid for the median, or lower or upper for the limits of the range. suffix is txt for plain ASCII text, or nc for netCDF. The text files have two columns, year and sea level change in metres. The netCDF files describe their contents using the CF convention.
13	13-SM-2	11			Insert "(‘tas’ in the CMIP5 archive)" after "air temperature"

Chapter	From Page	From Line	To Page	To Line	Edit
13	13-SM-2	12			insert "('zostoga')" after "temperature"
13	13-SM-2	34	13-SM-2	38	Replace the text beginning "As in the AR4" to the end of the paragraph with "The CMIP5 timeseries of thermal expansion X and global mean surface air temperature T were expressed as anomalies as a function of time t with respect to their time-means for 1986-2005, and the timeseries of ensemble means $X_M(t)$ and $T_M(t)$ and ensemble standard deviations $X_S(t)$ and $T_S(t)$ were calculated. As in the AR4, a Monte Carlo was used to generate distributions of timeseries of X and T in a perfectly correlated way; for each member of the ensemble, a random number r was chosen from a normal distribution, giving $X(t) = X_M(t) + r\,X_S(t)$ and $T(t) = T_M(t) + r\,T_S(t)$, and $T(t)$ was used to estimate land ice contributions to GMSLR, as described in the following sections. As in the AR4, all the uncertainties described by the land ice methods were assumed to be independent of the climate change uncertainty represented by the variation of r and of one another, except where stated, and were combined by Monte Carlo. Because of the use of Monte Carlo, the results for GMSLR have a random uncertainty. For different random samples of the sizes used to compute the results in Table 13.5, the results vary by up to 0.01 m in GMSLR and its contributions, and 0.1 mm yr^{-1} in the rate of GMSLR. The projections are shown for 2081-2100 in Table 13.5, and for 2100 in Table 13.SM.1."
13	13-SM-2	45			insert "(2013)" after "Oerlemans"
13	13-SM-2	49			insert "(2011)" after "van der Wal"
13	13-SM-2	51			replace "CMIP5" with "CMIP3 and CMIP5"
13	13-SM-3	6			After the end of the sentence, insert a sentence, "In order to incorporate this uncertainty into the projections, for each member of the Monte Carlo ensemble of glacier time-series, a normally distributed random number was chosen, independent of time, as a factor by which the time-dependent standard deviation should be multiplied, giving the error to be added to the glacier time-series."
13	13-SM-3	36	13-SM-3	37	Replace "This factor ... zero" with "This factor is taken to have a log-normal distribution i.e. one of the form $F = e^N$, where N is a normal distribution having a mean of zero"
13	13-SM-3	43			After "correlated", append ", and independent of time".
13	13-SM-3	44			Change 2.91 to 1.5.
13	13-SM-3	47			Change "(Section 13.3.3)" to "(Section 13.3.3.2, using data presented in Figure 4.15)".
13	13-SM-4	5			Delete "and" before "the ratio", and append to the sentence ", and the accumulation for the reference period was taken to be 1923 Gt yr^{-1} (Section 13.3.3.2)".
13	13-SM-4	24	13-SM-4	25	Change the sentence to read "Following Section 13.3.3.2, the contributions from rapid ice-sheet dynamics at the start of the projections were taken to be half of the observed rate of loss for 2005-2010 from Greenland (half of 0.46-0.80 mm yr^{-1} from Table 4.6) and all of that from Antarctica (0.21-0.61 mm yr^{-1} from Table 4.6)."
13	13-SM-4	27			Change the Antarctic range to "-0.020 to 0.185".
13	13-SM-4	31			After the sentence, insert a new sentence. "Finally, a constant 1.5 mm was added to the contribution from the Greenland ice sheet, and 2.5 mm to the contribution from the Antarctic ice sheet, these being the estimates of those contributions from 1996 to 2005 (using the data presented in Figures 4.15 and 4.16)".
13	13-SM-4	33			Change "final amounts" to "amounts for the time-mean of 2081-2100". Before the closing bracket, insert ", with no additional amount for land water storage from 1996 to 2005".
13	13-SM-4	38			Insert additional Table13-SM-1 on the projections at 2100 compared with 1986-2005 (similar to Table 13.5) at the end of Section 13-SM-1 and renumber subsequent tables. Table 13.SM.1: Median values and likely ranges for projections of global-mean sea level rise and its contributions in metres in 2100 relative to 1986–2005 for the four RCP scenarios and SRES A1B. See Section 13.5.1 concerning how the likely range is defined. Because some of the uncertainties in modelling the contributions are treated as uncorrelated, the sum of the lower bound of contributions does not equal the lower bound of the sum, and similarly for the upper bound. Because of imprecision from rounding, the sum of the medians of contributions may not exactly equal the median of the sum.
13	13-SM-5	47	13-SM-5	38	Change the following sentence: "The GIA contribution was taken from the ICE-5G model from Peltier 2004." To "The GIA contribution was calculated from the mean of the ICE-5G model (Peltier 2004) and the ANU ice sheet model (Lambeck et al. 1998 and subsequent improvements) with the SELEN code for the sea level equation (Farrell and Clark 1976; Spada and Stocchi 2006, 2007), including updates to allow for coastlines variation through time, near-field meltwater damping and Earth rotation in a self-consistent manner (Milne and Mitrovica, 1998; Kendall et al., 2006).
13	13-SM-6	6	13-SM-6	9	Change: "GIA uncertainty is estimated by finding the absolute difference between two different estimates of GIA – ICE-5G (Peltier 2004) and ANU (Nakada and Lambeck 1988), with this absolute difference taken to represent one standard error of the estimated contribution." To "The one standard error of the GIA uncertainty is evaluated as the departures of the two different GIA estimates (from ICE-5G and ANU/SELEN models) from their mean value."

Chapter	From Page	From Line	To Page	To Line	Edit
13	13-SM-8	18			Insert additional reference: Kendall, R., Latychev, K., Mitrovica, J.X., Davis, J.E., and Tamisiea, M., 2006. Decontaminating tide gauge records for the influence of Glacial Isostatic Adjustment: the potential impact of 3-D Earth structure, Geophys. Res. Lett., 33, L24318, doi:10.1029/2006GL028448.
13	13-SM-8	27			Delete this reference
13	13-SM-8	27			Insert additional reference: Milne, G.A., and Mitrovica, J.X., 1998. Postglacial sea-level change on a rotating Earth, Geophys. J. Int., 133, 1–10.
13	13-SM-8	38			Insert additional reference: Spada, G., and Stocchi, P., 2007. SELEN: a Fortran 90 program for solving the 'Sea Level Equation', Comput. Geosci., 33(4), 538–562, doi:10.1016/j.cageo.2006.08.006.
13	13-SM-8	38			Insert additional reference: Spada, G., and Stocchi, P., 2006. The Sea Level Equation, Theory and Numerical Examples, Aracne, Roma, p. 96, ISBN: 88–548–0384–7.
13	13-SM-8				Insert additional reference: Farrell, W.E., and Clark, J.A., 1976. On postglacial sea-level, Geophys. J. R. Astr. Soc., 46, 647–667.
13	Acknowl				added Acknowledgements: "We acknowledge the assistance of Lea Heather Crosswell and Louise Virginia Bell for their assistance in completing a number of diagrams in this chapter and Jorie Clark for assistance with managing chapter references."

Chapter 14: Climate Phenomena and their Relevance for Future Regional Climate Change

Chapter	From Page	From Line	To Page	To Line	Edit
14	3	3	3	5	Replace the sentence with “This chapter assesses the scientific literature on projected changes in major climate phenomena and more specifically their relevance for future change in regional climates, contingent on global mean temperatures continue to rise.”
14	3	11			Change order of footnotes to be consistent with comments above
14	3	11			Delete reference to footnote at this place and insert it line 24 after "medium confidence".
14	3	18			Change footnote numbering from "2" to "1"
14	3	20			Replace "very likely" with "likely"
14	3	21			Insert "in many regions" in front of "{14.2.1}"
14	3	24			Insert refernce to footnote 2 after "medium confidence".
14	3	45			Italicize "confidence"
14	4	29	4	30	Replace '…in the projections' to '…in the projections of future changes'.
14	4	35	4	35	Replace "Therefore El Niño-Southern Oscillation very likely…" with "Therefore there is high confidence that El Niño-Southern Oscillation…."
14	4	40			Replace "is likely in the future" with "is projected for the future, but with medium confidence"
14	4	43			Italicize "confidence"
14	4	54	4	55	Replace "indicate that precipitation will likely be more extreme near the centres of tropical cyclones making landfall in North and Central America, East Africa, West, East, South and Southeast Asia as well as in Australia and many Pacific islands." with "provide medium confidence that precipitation will be more extreme near the centres of tropical cyclones making landfall in North and Central America, East Africa, West, East, South and Southeast Asia as well as in Australia and many Pacific islands.".
14	5	7	5	8	Replace "There is medium confidence that a projected poleward shift in the North Pacific storm track is more likely than not" with "It is more likely than not, based on projections with medium confidence, that the North Pacific storm track will shift poleward".
14	6	49	6	49	Insert "pattern" after "(PNA)".
14	8	39	8	39	Delete "gridded".
14	9	23	9	24	Replace "summer" with "wet season"
14	9	51	9	52	Replace "The standard deviation of interannual variability in seasonal average precipitation (Psd) is likely to increase but some models show a decrease in Psd" with "The standard deviation of interannual variability in seasonal average precipitation (Psd) is projected to increase by many models but some models show a decrease in Psd".
14	9	55			Inser "in many regions" after "monsoon season".
14	10	31	10	31	Replace "Time series of simulated anomalies+G38 over the global land monsoon domain..." with "with a 20-year running mean, over the global land monsoon domain…"
14	10	46			Replace "referred to as SAS in the figure" with "referred to as SAS in Figures 14.3 and 14.4".
14	11	9			Replace "(Beck et al., 2005; light green)" with "GPCC Variability Analysis of Surface Climate Observations (VASClimO; Beck et al., 2005; light green)"
14	11	24			Remove "for 7 regional monsoon domains"
14	11	41	11	41	At the end of this sentence, add "(Section 9.4.6)"
14	12	5			Italicize "low confidence"
14	12	7			Italicize "confidence" and "low"

Chapter	From Page	From Line	To Page	To Line	Edit
14	13	11	13	11	Replace "Annex I" with "Figures AI.66-67"
14	13	24	13	26	Replace "CMIP3 models showed a divergence, with half the models overestimating Australian tropical rainfall and the other half underestimating it (Colman et al., 2011)" with "CMIP3 models showed a good representation in the ensemble mean, but a very large range of biases across individual models (more than a factor of 6; Colman et al., 2011)"
14	13	51	13	51	Replace "Annex I" with "Figures AI.66-67"
14	14	29	14	29	Replace "Annex I" with "Figures AI.27"
14	14	30	14	31	Italicize "confidence" and "low"
14	15	3			Italicize "medium confidence"
14	15	7			Italicize "medium confidence"
14	15	34			Italicize "confidence"
14	15	48	15	49	Replace "There is high confidence that global monsoon precipitation is likely ..." with "It is projected that global monosson precipitation will likely ...".
14	16	12			Italicize "high confidence"
14	16	12			Replace "It is likely that" with "There is medium confidence in"
14	16	13	16	15	Replace the sentence with "Projections of changes in the timing and duration of the SAMS remain uncertain."
14	16	16	16	17	Delete this sentence, since is repeats lines 11-12 almost verbatum.
14	16	20			Italicize "confidence"
14	16	44			Chadwick et al., 2012 --> Chadwick et al., 2013; update reference list
14	17	8	17	8	Replace “negative shaded” with “negative dashed”
14	18	40	18	41	Replace "confidence is low in assessing how the MJO will change …" with "it is currently not possible to assess how the MJO will change ...".
14	19	16	19	20	Replace "An easterly…" with "From ship-borne surface measurements, an easterly"
14	19	39			Italicize "confidence"
14	19	42	19	42	Replace "nearly unchanged in CMIP future projections" with "nearly unchanged in future projections of CMIP3 and CMIP5
14	21	8	21	9	Replace "there is high confidence that the tropical Indian Ocean is likely to feature ..." with "it is likely that the tropical Indian Ocean will feature ...".
14	22	7			Li and Ren, 2011 —> Li and Ren, 2012; update reference list
14	22	19	22	21	Replace "Since the late 1990s, the maximum SST warming during El Niño has been frequently observed in the central Pacific" with "With three events during 2000-2010, which meets intensity in Nino4 being larger than in Nino3, two events during 1990-2000 and only two events are found for 1950-1990 the maximum SST warming during El Niño now appears to occure more often in the central Pacific".
14	22	43	22	44	Replace ""“with epochs of extreme ENSO behaviour lasting decades or even centuries” with "with multi-decadal epochs of anomalous ENSO behaviour".
14	22	46	22	50	Replace figure caption with ""“Figure 14.14: Standard deviation in CMIP5 multi-model ensembles of sea surface temperature variability over the eastern equatorial Pacific Ocean (Nino3 region: 5oS-5oN, 150oW-90oW), a measure of El Nino amplitude, for the pre-industrial (PI) control and 20th century (20C) simulations, and 21st century projections using RCP4.5 and RCP8.5. Thirty-one models are used for the ensemble average. Open circles indicate multi-model ensemble means, and the red cross symbol is the observed standard deviation for January 1870 – December 2011 obtained from HadISSTv1. The linear trend and climatological mean of seasonal cycle have been removed. Box-whisker plots show the 16th, 25th, 50th, 75th, and 84th percentiles.”
14	23	4	23	6	Replace ""“It is very likely, however, that ENSO will remain the dominant mode of natural climate variability in the 21st century (Collins et al., 2010; Figure 14.14)" with “There is high confidence, however, that ENSO will remain the dominant mode of natural climate variability in the 21st century (Collins et al., 2010; Guilyardi et al. 2012; Kim and Yu 2012; Stevenson 2012).”

Chapter	From Page	From Line	To Page	To Line	Edit
14	23	6	23	7	Delete sentence "Due to enhanced…."
14	23	14	23	16	Replace “CMIP5 showed a systematic eastward shift in both El Niño- and La Niña-induced teleconnection patterns over the extratropical Northern Hemisphere (Meehl and Teng, 2007; Stevenson et al., 2012)” with “CMIP5 showed a systematic eastward shift in both El Niño- and La Niña-induced teleconnection patterns over the extratropical Northern Hemisphere (Meehl and Teng, 2007; Stevenson et al., 2012; Fig. 14.15)”.
14	23	27			Add new paragraph after line 26: "In a warmer climate, the increase in atmospheric moisture intensifies temporal variability of precipitation even if atmospheric circulation variability remains the same (Trenberth 2011; Section 12.4.5). This applies to ENSO-induced precipitation variability but the possibility of changes in ENSO teleconnections complicates this general conclusion, making it somewhat regional-dependent (Seager et al. 2012)".
14	23	49	23	50	Replace “It is very likely that ENSO will remain the dominant mode of interannual variability with global influences in the 21st century, ” with “There is high confidence that ENSO will remain the dominant mode of interannual variability with global influences in the 21st century, ”
14	26	8			Replace "10.12" with "10.13".
14	26	41			Replace "Section 9.1.3.2.7" with "Section 9.1.3.2.8".
14	27	6	27	7	Replace "trends" and "those" with "trend" and "that" respectively.
14	27	50	27	51	Replace "Section 14.7.5" with Section "14.7.3".
14	28	35	28	36	Replace "There is high agreement that winter blocking frequency over north Atlantic and north Pacific is unlikely to increase under enhanced GHG concentrations" with "There is high agreement that winter blocking frequency over the north Atlantic and north Pacific will not increase under enhanced GHG concentrations".
14	29	44	29	45	Delete: "since the United States Clean Air Act and Amendments during and after the 1970s (with further contribution from the European Commission’s Air Quality Framework Directive)"
14	30	3	30	3	After "observed" add "(Section 10.6)"
14	30	15	30	15	Replace "assessment" with "study"
14	30	43			After “(Figure 14.17).“add the follwing sentence “Confidence is somewhat better in the North Atlantic and western North Pacific basins where an increase in the frequency of the strongest storms is more likely than not.“
14	31	33	31	33	Replace "has" with "may have"
14	33	54	33	55	Italicize "confidence" and "low"
14	34	26			Replace "lower confidence" with "low confidence" and the latter in *itallic*
14	34	29			After the final sentence ending "….21st century warming" add ", and there is medium confidence that tropical cyclone rainfall rates will increase in every affected region".
14	34	31	34	32	Delete the first few words of the sentence ("There is high confidence that") and simply starting the sentence with "The global number ... is unlikely to decrease ...".
14	34	32	34	33	Delete the first few words of the sentence ("There is high confidence that") and start the sentence with "A small poleward shift is likely ...".
14	34	33	34	35	Replace senetence with "There is only medium confidence in projections of storm track shifts in the Northern Hemisphere. Nevertheless, model results suggests that it is more likely than not that the N. Pacific storm track will shift poleward, and that it is unlikely that the N. Atlantic storm track will respond with a simple poleward shift.".
14	35	13			Replace "Table 2.12" with "Table 2.14".
14	35	50	35	50	Insert "projections of" ahead of "future changes".
14	36	21			Italicize "confidence"
14	36	47			Italicize "confidence"
14	37	4	37	5	Delete "(Chapters 2 and 10)".
14	37	39			Italicize "confidence"

Chapter	From Page	From Line	To Page	To Line	Edit
14	38	6	38	6	Replace "additional six" with "six additional".
14	38	48	38	48	Put the assessment ("high confidence") in italics.
14	38	48	38	48	Replace "that there will be a positive future change in the NAO index" with "that the NAO index will increase in response to anthropogenic forcing".
14	39	51			Replace "Section 14.7.5" with Section "14.7.3".
14	40	4	40	4	Replace "likely" with "probably".
14	40	22			Replace "4.6" with "5.0"
14	40	23			Replace "7.4" with "7.0".
14	40	23			Replace "Arctic" with "Arctic Sea".
14	40	25			Replace "2.3" with "2.2"
14	40	26			Replace "Arctic" with "Arctic Sea".
14	40	33			Replace "pan-Arctic" with "pan-Arctic (both land and sea)".
14	41	6	41	6	Replace "see Box 14.3" with "see Section 14.6.1"
14	41	14	41	15	Section 2.6.1 should be 2.4.1. Figure 2.3.2 should be 2.25.
14	42	5	42	6	Replace "Higher resolution simulations show a tendency towards more precipitation..." with "One set of high resolution simulatons (Endo et al., 2012) shows a tendency towards more precipitation..."
14	42	7	42	9	Italicize "medium confidence" in two cases
14	44	4			Replace "14.7.2" with "14.7.1".
14	44	25	44	26	Replace "fail to reproduce" with "do not simulate".
14	44	48	44	48	Replace "for end of century" with "for the end of the twenty-first century".
14	45	30	45	30	Replace first "CMIP5" with "CMIP3".
14	45	36	45	36	Replace "represent features of Canonical and Modoki ENSO" with "represent certain features of ENSO"
14	45	40	45	40	Replace "14.4.6" with "14.4.2".
14	45	44			Replace "14.7.2" with "14.7.1".
14	46	33	46	35	Replace "Recent 1979–2010 trends in annual mean temperature in each subregion have all exceeded the global mean land trend of 0.27°C per decade (Table 2.4): [NEU: 0.48°C per decade; CEU: 0.44°C per decade; MED: 0.34°C per decade]" with "Recent 1981-2012 trends in annual mean temperature in each subregion all exceed the global mean land trend as can be interred from Figure 2.22.".
14	47	3	47	3	Replace "findings" with "assessments".
14	47	4	47	4	Replace "Chapter 11" with "Christensen et al, 2007"
14	47	15	47	15	Add "(Section 11.3)" after "climate system"
14	49	4	49	6	After "(d'Orgeval et al., 2006)" insert ", although this appears to be less robust in the CMPI5 models (Section 14.2.4)."
14	50	6	50	8	Replace "In summary, due to the physical understanding of the processes involved and models (in)ability to capture large scale climate evolution and represent local processes" with "In summary, given models' ability to capture local processes, large scale climate evolution and their linkages".
14	50	9	50	10	Replace "Due to the inability of GCMs to capture the convective systems adequately, there is *low confidence* in projection statements about drying or wetting of WAF" with "But there is low confidence in projection statements about drying or wetting of WAF".

Chapter	From Page	From Line	To Page	To Line	Edit
14	50	10	50	12	Replace "But due to models ability to capture the overall monsoonal behaviour, there is medium confidence in projections of a small delay in the rainy season with an increase at the end of the season." with "Owing to models' ability to capture the overall monsoonal behaviour, there is *medium confidence* in projections of a small delay in the rainy season with an increase at the end of the season."
14	50	36	50	38	Delete this sentence "Hence model simuations …"
14	50	40			Replace "As a part of the polar amplification large warming trends (>2°C per 50 years) in the second half of the 20th century are observed in the northern Asian sector (Chapter 2 and Chapter 4)" with "As a part of the polar amplification, large warming trends in recent decades are observed in the northern Asian sector (e.g. Figure 2.22)".
14	50	42			Replace "2.4°C" with "2.4°C per 50 years".
14	51	4	51	4	Delete sentence "The sensitivity…".
14	51	15	51	15	Delete "but as an exact dependence on climate phenomena is not well constrained and therefore presumably weak"
14	51	17			Italicize "confidence"
14	51	21	51	21	Delete "trend"
14	52	1	52	6	Insert qutation marks around sentences. Begin: "It is very likely... E.g. before 'It' End: ….are likely to increase"
14	52	1			Replace "(Section 11.4)" with "(Christensen et al., 2007, Section 11.4)".
14	52	6			Delete "(Christensen et al., 2007)"
14	52	26	52	26	Replace "Table 14.8.a" with "Table 14.1"
14	52	45	52	50	Replace "But the level of confidence in the projected changes is low due to the limited skill of CMIP5 models in simulating the East Asian summer monsoon rainband (Table 14.2)." with "However, there is only low confidence in more specific details of the projected changes due to the limited skill of CMIP5 models in simulating monsoon features such as the East Asian monsoon rainband (Table 14.2)".
14	52	49			Remove "but" and replace "low" with "medium".
14	53	2			Replace "Section 14.2.9" with "Section 14.5.1".
14	54	18	54	18	Insert "thought to be" ahead of "due to a number of factors".
14	54	24	54	25	Delete "also reflected in Figure 14.25 right panel"
14	54	30	54	30	Add "; Section 14.2.2" after "2012".
14	54	43	54	43	Replace "refer to Chapter 9" with "Section 9.5.2.3"
14	54	54			Replace "Table 14.2" with "Table 14.1"
14	55	34	55	34	Replace "(Section 11.4)" with "(Christensen et al., 2007, Section 11.4)".
14	55	36			Replace "RCP 2.8" with "RCP 2.6".
14	57	10			Replace "relative to 1990, Table 14.1" with "relative to 1990".
14	57	16	57	16	Add "; Section 14.4" after "2010".
14	57	36	57	38	Replace "virtually certain" with "very likely".
14	58	46	58	47	Replace "Extreme rainfall days are likely to occur more often in all regions (Perkins, 2011), based on an intensification of the ITCZ and the SPCZ" with "Extreme rainfall days are likely to occur more often in all regions related to an intensification of the ITCZ and the SPCZ (Perkins 2011)".
14	59	57			Replace "Section 9.1.3.2.4" with "9.4.3"
14	60	21	60	21	Replace "over the oceans" with "of the oceans". Also replace "those over" with "surface air temperature over".

Chapter	From Page	From Line	To Page	To Line	Edit
14	60	25	60	25	Replace "moderate confidence" with "medium confidence"
14	61	6	61	7	Replace “Section 14.4" with "see 12.4.4.1 and 14.5.2 for more information".
14	61	50	61	51	Delete "rather than to longer-term human influences on the climate".
14	62	26	62	27	Change "very likely" to "likely"
14	83	63			Add reference: Seager, R., N. Naik, and L. Vogel, 2012: Does Global Warming Cause Intensified Interannual Hydroclimate Variability? J. Clim., 25, 3355-3372
14	90	1	90	1	Add reference: Trenberth, K.E., 2011: Changes in precipitation with climate change. Climate Res., 47, 123-138.
14	130				Replace Figure 14.15 with new Figure 14.15 as labels are missing in current version
14	131				Figure caption needs to be refined; Replace "10.12" with "10.13".
14	144				Figure updated and the Figure caption replaced by "FAQ 14.1, Figure 1: Projected 21st century changes in annual mean and annual extremes (over land) of surface air temperature and precipitation: a) mean surface temperature per °C of global mean change, b) 90th percentile of daily maximum temperature per °C of global average maximum temperature, c) mean precipitation (in % per °C of global mean temperature change), and d) fraction of days with precipitation exceeding the 95th percentile. Sources: Panels a) and c) projected changes in means between 1986–2005 and 2081–2100 from CMIP5 simulations under RCP4.5 scenario (see Chapter 12, Figure 12.41); Panels b) and d) projected changes in extremes over land between 1980–1999 and 2081–2100 (adapted from Figs. 7 and 12 of Orlowsky and Seneviratne, 2012).".
14	Note				FAQ 14.1 and FAQ 14.2 are swapted in printed version. Error corrections here do not take that into account in their referencing to the figure numbers. I.e., FAQ 14.1 refers to the FAQ 14.1 from the Final Draft.
14	Refs				Add the following missing reference (between the Wang B 2008b and Wang B 2012a references): Wang, B., H.-J. Kim, K. Kikuchi, and A. Kitoh, 2011: Diagnostic metrics for evaluation of annual and diurnal cycles. Clim. Dyn., 37, 941–955.
14	SM				The same applies to tables 14.SM1.a, 14.SM1.b and 14.SM1.c in the Supplementary Material for Chapter 14

Annex I: Atlas of Global and Regional Climate Projections

Chapter	From Page	From Line	To Page	To Line	Edit
AI	1	40	1	40	...consideration of the physical basis...
AI	1				Scripts producing the maps inadvertentlly left out two GISS model version. These are reinstated in the final version.
AI	2	26	2	27	Table AI-1 add a new row for the MPI-ESM-P model with 'tas/pr' in the piControl column but no other entries as it wasn't used in any of the scenario figures
AI	2	26	2	27	Table AI-1 add 'tas/pr' in the piControl column against ACCESS1-0 model
AI	2				Table AI.1: change 'historical' ensemble member of EC-EARTH from "1" to "8"
AI	5				Figure AI.1: Revised ordering of percentile labels i.e. the 95%, 75%, median, 25%, 5% from top to bottom

Annex II: Climate System Scenario Tables

Chapter	From Page	From Line	To Page	To Line	Edit
All	1	37			Replace "7.1–4, and 7.5" with "7.1 to 7.5"
All	2	24	2	24	added NF3 to the list of (KP) gases, defined as "nitrogen trifluoride"
All	7	2	7	3	The new Kyoto gas NF3 was inadvertently left off the table; and the year 2005 (critical for recent growth) was also missing.
All	10		13	1	Volcanic RF were in error Table AII.1.2, YEARS 1852-2011,they did not give the annual average - corrected.
All	13	5			"Values are annual average." added to end of table notes, based on correction above
All	45				Table AII.7.4: Add "2000" in all subtables where it is missing (see 'Africa' for an example of how it should be)
All	46		47		Change all "PI*" to "1850-1900"
All	47	15			Replace "from pre-industrial (PI* = 1850–1900)" with "from early instrumental record (1850–1900)"
All	48	8	48	9	Sea level rise had small errors, shift of 0.01 in last decimal place, Table AII.7.7, YEARS 2010-2100, corrected

Annex III: Glossary

Chapter	From Page	From Line	To Page	To Line	Edit
AIII	1	26	1	27	Entry "Aerosols": use of the singular form in the entry rather than the plural form, and addition of a sentence after the first one on the use of the plural form: "For convenience the term aerosol, which includes both the particles and the suspending gas, is often used in this report in its plural form to mean aerosol particles.".
AIII	6	1	6	1	Entry "Climate Feedback Parameter": "lambda" replaced by "alpha" for the designation of the "Climate Feedback Parameter".
AIII	8	12	8	12	Entry "Confidence": The number of the Figure describing the levels of confidence is changed (Figure 1.11).
AIII	8				Hegerl et al., 2009 --> Hegerl et al., 2010; update reference list
AIII	10				Swap "Darwin" and "Tahiti"
AIII	11	41	11	41	Entry "Equivalent carbon dioxide (CO2) concentration": addition of the two following sentences at the end of the definition: "Equivalent carbon dioxide concentration is a metric for comparing radiative forcing of a mix of different greenhouse gases at a particular time but does not imply equivalence of the corresponding climate change responses nor future forcing. There is generally no connection between equivalent carbon dioxide emissions and resulting equivalent carbon dioxide concentrations".
AIII	11	44	11	46	Entry "Equivalent carbon dioxide (CO2) emission": deletion of "well-mixed" (3 occurrences).
AIII	11	48	11	49	Entry "Equivalent carbon dioxide (CO2) emission": in the last sentence of the definition, "standard and useful metric" replaced by "common scale" and ""exact" deleted.
AIII	11				Insert "See also Equivalent carbon dioxide concentration." at end of paragraph that starts with "Equivalent carbon dioxide (CO2) emission "
AIII	13	51	13	52	Entry "Global Warming Potential (GWP)": deletion of "well-mixed" (2 occurrences).
AIII	13	55	13	55	Entry "Global Warming Potential (GWP)": in the last sentence of the definition, "absorbing outgoing terrestrial radiation" replaced by "causing radiative forcing".
AIII	17	12	17	12	Entry: "Land water storage": added. It reads as follows: "Water stored on land other than in glaciers and ice sheets (that is water stored in rivers, lakes, wetlands, the vadose zone, aquifers, reservoirs, snow and permafrost). Changes in land water storage driven by climate and human activities contribute to sea level change.".
AIII	17	27	17	32	Entry "Level of Scientific Understanding (LOSU)": deleted.
AIII	18	30	18	30	Entry: "Marine-based ice sheet": added. It reads as follows: "An ice sheet containing a substantial region that rests on a bed lying below sea level and whose perimeter is in contact with the ocean. The best known example is the West Antarctic ice sheet.".
AIII	20	27	20	27	Entry "Near-term climate forcers (NTCF)": added. It reads as follows: "Near-term climate forcers (NTCF) refer to those compounds whose impact on climate occurs primarily within the first decade after their emission. This set of compounds is primarily composed of those with short lifetimes in the atmosphere compared to well-mixed greenhouse gases, and has been sometimes referred to as short lived climate forcers or short-lived climate pollutants. However, the common property that is of greatest interest to a climate assessment is the timescale over which their impact on climate is felt. This set of compounds includes methane, which is also a well-mixed greenhouse gas, as well as ozone and aerosols, or their precursors, and some halogenated species that are not well-mixed greenhouse gases. These compounds do not accumulate in the atmosphere at decadal to centennial timescales, and so their effect on climate is predominantly in the near term following their emission.".
AIII	20	27	20	27	Entry: "Near-surface permafrost": added. It reads as follows: "A term frequently used in climate model applications to refer to permafrost at depths close to the ground surface (typically down to 3.5 m). In modelling studies, near-surface permafrost is usually diagnosed from 20 or 30 year climate averages, which is different from the conventional definition of permafrost. Disappearance of near-surface permafrost in a location does not preclude the longer-term persistence of permafrost at greater depth. See also Active layer, Frozen ground and Thermokarst.".
AIII	22	6	22	6	Entry "Permafrost": addition at the end of the definition of: "See also Near-surface permafrost.".
AIII	23	34	23	34	Entry "Radiative forcing": "irradiance" replaced by "radiative flux".
AIII	23	45	23	45	Entry "Radiative forcing": "irradiance" replaced by "radiative flux".
AIII	25	16	25	16	Entry "Representative Concentration Pathways (RCPs)": The number of the Box describing the RCPs is changed (Box 1.1).