SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
1495	4	0	0	0	0	General: Well written chapter and well supported with literature [Chandani APPADOO, Mauritius]	Thank you for this positive feedback
20217	4	0	0	0	0	In general, the group agrees that the chapter content reflects its outline. The chapter is well organized, following a logical structure. The text is clear and well-written with lot of references, and homogeneous through the chapter, even if we can clearly identify that different authors wrote different parts. The scientific progress since AR5 are consequent for ice sheet modelling as well as for glacier modelling and sea level budget at slightly lower degree.Nevertheless, the group has few main remarks. The number of figures is low compared to the length of the text, especially for the part 4.3 and 4.4. The part 4.2 is essential to the chapter with the description of sea-level related processes and the progress in their understanding since AR5. However, the text is sometimes too vague and not enough exhaustive to completely understand the physics of sea-level change, especially for non-specialists without enough explanation or references. In particular, the sea-level budget section does not provide a complete overview. Since SROCC report is an assessment report and will be a part of an entire IPCC report, it is maybe not a problem. Nevertheless, SROCC is also designated for a large audience as well as policy makers, and thus a solid background and overview is needed to better capture the current progress made and the remaining gaps (for example, the section 4.2.3 about projections of sea level change is viewed by the group as a perfect section with good balance between explanations, references and summary sentences at the beginning of the paragraphs). In addition, some references can be a little bit more explained, in particular those providing new insights instead of just putting the reference in parenthesis (e.g. pp 21, Cazenave et al., 2018). The group also think there is a too small discussion about sea level rise commitment due to ice mass loss and thermal expansion commitment, and that discussion concerns only the ce sheets.The group has also minor remarks. The text could be justified for a better clarity. Acidification is to our understanding not mentioned as major impact for coastal waters despite or not discussed why it is not a major impact. A particular attention could be paid to looking how to best assist the communities that have histories of discrimination (Southern Africa) to deal with the long-term threat of sea-level rise without undermining their sense of place and dignity. In the first item of the executive summary, it would be better to present today evidence of sea-level rise in addition to the past observations. The section 4.4.5 was very helpful to better comprehend section 4.4.4 because a lot of the terminology was not explained in the latter section and made it hard to follow. Finally, the links with the recent IPCC report on 1.5 degree warming is not sufficient, especially concerning Antarctic & Greenland (and the recent study Pattyn et al., 2018, https://doi.org/10.1038/s41558-018-0305-8 is not presented).To conclude, the group would like to remind that all comments (individual & chapter) are suggestion because we don't have all the keys to do a complete review, and the physical part of this chapter has been easier to review because of its vicinity to the main thematics of APECS members. [APECS Group Review, Germany]	Thank you for your constructive suggestions. Concerted efforts have been made to outline in plain language the underpinning science behind SLR, and its observed and projected impacts, and possible responses. A new section has been introduced at the start of the chapter to provide an integrative overview of the chapter as a whole. This we hope will go a long way to make key findings accessible in an integrated way for general readership. More detailed information is then elaborated in subsequent sections. Given the scope of the subject, and relevant literature assessed, and the word limits allocated to this chapter, careful consideration was given to allocation of space to assessing areas in which post-AR5 literature has developed most significantly; including judicious use of figures and tables that most meaningfully support the assessment.
26963	4	0	0	0		As an activity of the WCRP Grand Challenge on sea level, we (Gregory et al., under review) have written a paper for Surv Geophys on sea level terminology. The authors of the WG1 AR6 sea level chapter aim to use terminology consistent with that paper. I have some comments that compare terminology in your chapter with that paper. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for this remark, we largely follow the advise formulated in Gregory et al. 2019
2979	4	0	0	0		Please note that providing 17th-83rd percentiles for projections is a much stronger statement than providing a likely range (probability larger than 66%). For example, the probability of exceeding the 17th-83rd percentile interval is exactly the same as the probability of being below this interval. Where such statements are provided, are there any evidence supporting such a statement? (e.g., p44 L38, …….). [Goneri Le Cozannet, France]	There has been a typo in the footer of the SOD version, where coincidentally the specific meaning of likely range was not explained, but in this chapter we use the 17-83 percentile as the likely range

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2989	4	0	0	0		Some projections are provided in the form of "median" projections together with a "likely range" (e.g., table 4,3, 4,5, etc), as it was done in the AR5 sea level report. Pease note that: (1) the probability of exceeding the median is exactly 50%; (2) the probability of exceeding the 17th-83rd percentile levels (sometime used as a synonym to likely in some parts of the report) is exactly 17%; (3) the probability of exceeding the likely range (as defined in Mastrandrea et al (2010) may vary from 0 to 33%. For consistency, this report may consider using the term "best guess" instead of "Median" where a likely range is provided, and limit the use of the median where a probabilistic statement can be provided and no interpretation of probabilistic models outcomes are needed. [Goneri Le Cozannet, France]	see previous comment
10819	4	0	0	0		Overall I think the report is well written, balanced and gives a good overview of the existing science [Magnus Hieronymus, Sweden]	Thank you for this positive feedback
12073	4	0	0	0		This chapter lacks the scenarios of sea level rise and its risks beyond the 21st century, or policy recommendations in this connection. These elements are extremely important for the planning and development of coastal cities, especially for major projects of a long cycle. So it is suggested to make relevant additions. [Government of China, China]	We improved the long term section and have an Executive Statement on this now
15247	4	0	0	0		Hardly any comparison is being conducted regarding results presented in the IPCC SR1.5, despite a clear mandate for the SROCC to do so. Please expand the assessment referencing/comparing to SR1.5 findings where available. [Government of Gambia, Gambia]	We have attempted to do this wherever appropriate but our mandate is much wider so most focus is on the difference between RCP2.6 and RCP8.5
15249	4	0	0	0		It is concerning that only very little information on regional sea level rise projections is provided. IPCC stakeholders with particularly vulnerable coastal regions need to be provided with regional information that will allow them to derive specific adaptation strategies etc. Please add more specifc regional information to the chapter assessment. [Government of Gambia, Gambia]	We have a figure on regional sea level and on top we provide a very detailed analysis of extreme sea level events which is critical for the development of adaptation strategies. So we really convinced that we emphasize the regional and local scales more than in earlier IPCC reports
15647	4	0	0	0		In broad terms, the chapter on sea-level rise is highly technical in content, making for a not so easy reading by the less informed reader. Further consideration should perhaps be given to the language used in the chapter, with the target audience in mind. Parts of this chapter are possibly too complex and technical for the average consumer of IPCC publications. [EUCE, Belgium]	We reorganized the chapter to facilitate the broader audience by a more general description of section 4.1
15677	4	0	0	0		Across the board, there is an over reliance on DeConto (in review) and DeConto and Pollard 2016 papers - this is excessive and a large risk. [EUCE, Belgium]	We disagree w.r.t. DP16 because our assement implies that results of this paper are not used in the end and it is explained why this is the case. This is an important point for the community. We agree that the SOD makes a bit the impression that we rely on D19, this has solved itself by the fact that this paper has not been accepted in time and moreover because some extra papers were published after the SOD allowing us to widen our scope for the assesment of the Antarctic contribution.
15679	4	0	0	0		This publication should be considered: " Global probabilistic projections of extreme sea levels show intensification of coastal flood hazard" was published on 18 June 2018 ((https://www.nature.com/articles/s41467-018-04692-w) [EUCE, Belgium]	Yes we agree, there was a mistake in our referencing
15681	4	0	0	0		This publication should be considered: "Global long-term observations of coastal erosion and accretion" was published on 27 August 2018 (https://www.nature.com/articles/s41598-018-30904-w#ref-CR56) [EUCE, Belgium]	We considered but believe we have already enough citation in the section on anthropogenic subsidence

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16315	4	0	0	0		Thanks a lot to the Chapter authors for compiling the SOD! While many sea level rise related topics are covered comprehensively in this Chapter, the post-2100 assessment, in particular, is still too weak. The literature review is not up-to-date. Also, there is not enough specific information elevated to the ES for multi-centennial/multi-millenial SLR and SLR commitments. The sea level projection assessment in this Chapter still focuses too much on 2100 even though it is very clear that this time frame is insufficient to evaluate the imprint of emission pathways on SLR trajectories. Despite the very large uncertainties, we are in a position to provide meaningful information on longer-term SLR both for AR5 consistent SLR dynamics and latest estimates that include more rapid Antarctic discharge processes. Even if process understanding is not advanced enough to precisely capture potential non-linearities of Antarctic ice sheet responses, in particular, the expected multimeter scale of longer-term SLR commitments has to be communicated better to IPCC stakeholders, coastal planners and policy makers. [Alexander Nauels, Germany]	We have improved the long-term section and the Executive Statements on this point
16317	4	0	0	0		Some of the projections assessed in the Chapter are presented incorrectly, in particular, some of the estimates/ranges provided in Table 4.5 are wrong. We will provide more specific comments. [Alexander Nauels, Germany]	Yes there were mistakes in this Table which we have tried to correct
16319	4	0	0	0		While the SROCC assessment explicitely states that relevant information from SR1.5 is taken into account, these references/notes/comments are very rare in the Chapter text. On many issues, the SR1.5 assessessment seems to be actually more specific than the SROCC SOD which should not be the case. [Alexander Nauels, Germany]	Accepted. We have made an attempt to insert citation of SR15 wherever directly relevant to Chapter 4 statements without doing so at every statement that could conceivably have such a connection.
16503	4	0	0	0		The entire chapter seems to have considerable potential for getting condensed. [Georg Kaser, Austria]	The FGD version is shorter than the SOD version
21683	4	0	0	0		I would agree that the MICI mechanism makes a big step forward and should be of importance for ice sheet dynamics and futurre sea level projection, but not necessaily stressed this much. Even we have not enough evidences to support this hypothesis yet in Antarctica. [Government of Republic of Korea, Republic of Korea]	We have attempted to reach a more balanced view on this in the final version
22095	4	0	0	0		Thank you for giving every scientist (in particular early career) the opportunity to comment on this report. This is a tremendous work and a great initiative. However, the chapter (and the report in general) might be too long. It might have a larger impact if shorter (~50 pages per chapter). [Julia Pfeffer, Australia]	We have attempted to reduce the length of the chapter, but remember it covers a wide range of topics
22157	4	0	0	0		"IPCC till now (as also in AR5) has been using the term "small islands, low lying coastal areas and deltas" thus, the use on "Low Lying Islands" seems limiting in scope. [NAYANIKA SINGH, India]	The approved outline for SROCC and this chapter defined the scope and focus of our assessment. Low-lying has helped to contain and focus our assessment of SLR that has particular relevance to low-lying coasts. We nonetheless cover the full range of coastal settings affected by SLR, and therefore don't think our assessment has been constrained by the scoping of our chapter and SROCC.

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23361	4	0	0	0		I find the introduction section of this chapter very long and without references. To reconsider. This applies to pages 6 until the first half of page 10. It has more a textbook style than the introduction to an assessment. Several sections fail to indicate what is new since the AR5 and lack a conclusion where key findings are expressed with use of the confidence language and then repeated in the ES (ex in subsections of 4.2.2). [Valerie Masson-Delmotte, France]	Taken into account. The introductory section has been rewritten to provide a succinct integrative assessment of observed and projected SLR, impacts and risk, and responses. This integrative introduction provides a foundation for those needing more topic specific assessment in subsequent sections of the chapter.
24021	4	0	0	0		I would agree that the MICI mechanism makes a big step forward and should be of importance for ice sheet dynamics and futurre sea level projection, but not necessaily stressed this much. Even we have not enough evidences to support this hypothesis yet in Antarctica. [WON SANG LEE, Republic of Korea]	see comment 21683
25561	4	0	0	0		"Many study objects of this report exhibit a substantial time lag in their response. This is the case for ocean circulation or coupled systems (AMOC, ENSO) and obviously the cryosphere. Adopting a framing up to 2100 therefore seems wholly inappropriate. Doing so has several consequences: 1.Miscommunication about the long-term impacts of climate change: If the IPCC does not clearly communicate i.e. the risks of an irreversible long term SLR commitment of >30m under high end scenarios, the public won't know. 2.Miscommunication about the differences between scenarios: For time-lagged systems such as glaciers and even more ice sheets and associated SLR, the main differences between different mitigation pathways will materialize beyond 2100. Not informing governments about these important differences means downplaying the benefits of mitigation. 3.Miscommunication about the legacy of present-day actions: By focusing on 2100 and the fact that SLR is largely scenario independent until mid-century, the report fails to convey the message of urgency that comes from our increased understanding about the cryosphere. Important recent studies have investigated the sea level commitment by GHG emissions implied by the NDCs up to 2030 (Clark et al. 2018) and have shown that every five years delay in peaking global CO2 leads to ~20cm median SLR increase in 2300 for Paris compatible scenarios (Mengel et al. 2018, notably without triggering tipping points). Not clarifying the link between short-term emissions and long-term SLR (or glacier melt, Marzeion et al. 2018 identify this for glaciers as well) is a major short-coming. In recent literature, 2300 has emerged as a useful time scale to illustrate differences in time lagged systems. There is also CMIP5 information available on this time frame through the extended RCPs. Furthermore, information on long-term sea level rise risks should be included in the SPM. In any case, a dedicated figure linking GHG emissions to long-term changes in	Taken into account. We agree that adopting a framing only up to 2100 would be inadequate for understanding and addressing SLR. This issue is addressed thoughout the chapter, including in section 4.2.3.5 that assesses findings about long term projections beyond 2100. We also highlight the adaptation implications of low vs high RCP scenarios, including in the choices about response options (4.4.2), the underlying governance challenges faced in responding to SLR (4.4.3) and how these challenges might be addressed (4.4.4).

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25565	4	0	0	0		The framing of “deep uncertainty” adopted here is very unhelpful in communicating the risks of ice sheet instabilities. It is understood that our current state of knowledge does not allow us to determine these thresholds with some certainty and unstable retreat might already be underway for some glaciers. But then the IPCC needs to say so and not just hide behind uncertainties. Key findings from the literature on ice sheet stability, i.e. that “In our simulations, at 5-km horizontal resolution, the region disequilibrates after 60 y of currently observed melt rates” (Feldmann & Levermann, 2015) or on Greenland outlet glacier stability (i.e. Rignot et al. 2017) are missing. And it is clear that the risks for destabilizing ice sheets is increasing with increasing warming. This is also not communicated well. [Schleussner Carl-Friedrich, Germany]	we have detailed our reasoning including relevant literature
25567	4	0	0	0		Please provide information on SLR at 1.5°C and 2°C. The 1.5°C SR has done so and this should also be re-assessed here (also noting that new literature has become available since, i.e. 10.1146/annurev-environ-102017-025835) [Schleussner Carl-Friedrich, Germany]	we have added references to 1.5
25687	4	0	0	0		A paper by Agarwal et. al. 2015 in ERL may be referred in this chapter. The paper discusses the effect of including Antarctic and Greenland ice meltwater in one of the CMIP-5 models on regional sea level. The reference is "Neeraj Agarwal, Johann H. Jungclaus, Armin Köhl, C. R. Mechoso, and Detlef Stammer. "Additional contributions to CMIP5 regional sea level projections resulting from Greenland and Antarctic ice mass loss." Environmental Research Letters 10, no. 7 (2015): 074008." [Government of India, India]	This topic is addressed in the section on the dynamic contribution of Antarctica
25751	4	0	0	0		Link with IOC, UNESCO and its related activities, especially UN Decade of Oceans for sustainability may be included [Government of India, India]	Noted. We highlight the need to improve coordination of cross-scale governance efforts to address SLR, from the local to global level (4.4.4) but given the many bodies and initiatives involved, it was not feasible to list specific organisations or initiatives. The concluding section of the chapter highlights the important influence SLR responses will have on achieving the UN SDGs and pursuit of climate resilient development pathways (4.4.6)
27437	4	0	0	0		Thanks a lot to the authors of this chapter! I have two overarching points: 1) The discussion of the Antarctic ice sheet is much too detailed (7 pages), especially compared to the part of global sea level projections (only half a page). The Antarctic part is based only on a few papers of a small author group and does not provide a balanced view. 2) For sea level, the longer term commitment is a core motivation for mitigation. The SOD does not provide numbers for post 2100, and only has a qualitative discussion on longer term changes. This is not necessary as literature exist at least for the next three centuries of sea level rise. This needs to be addressed. If readers only look at 2100 numbers, they cannot grasp the huge impacts (and benefits of mitigation) for 21st century emissions. [Matthias Mengel, Germany]	We improved the long term section and the projection section
28455	4	0	0	0		The Chapter lacks very important linkages to IPCC SR1.5. A 1.5 degC specific assessment of sea level rise related issues has to be presented. This issue must be adressed for the Final Draft. [Government of Saint Lucia, Saint Lucia]	we have added references to 1.5
28457	4	0	0	0		Particularly vulnerable coastal countries, in particular, require regional information to better assess future scenarios and required response measures. Chapter 4 currently lacks adequate regional coverage. Please expand the regional sea level projection assessment, in particular, as IPCC stakeholders will ask for this information. [Government of Saint Lucia, Saint Lucia]	We have a figure on regional sea level and on top we provide a very detailed analysis of extreme sea level events which is critical for the development of adaptation strategies. So we really convinced that we emphasize the regional and local scales more than in earlier IPCC reports

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28459	4	0	0	0		In order to capture the scale of expected coastal impacts from sea level rise, the long-term time horizon has to receive more attention. Currently, Chapter 4 focuses too much on the 21st century, which is very important but does not adeqautely convey the full picture of sea level rise related impacts. The long-term perspective can be covered in much more detail despite the existing very large uncertainties for high emission scenarios due to a lack of Antarctic ice sheet process understanding. Several recent publications have drawn the link between mitigation pathways and long-term sea level commitment including from the CLA of the sea level chapter of the AR5 (Clark et al 2018, Nature Climate Change). The chapter balance has to be revisited as IPCC stakeholders expect more extensive coverage of post-2100 sea level rise and its implications. [Government of Saint Lucia, Saint Lucia]	We have expanded the long term section
31169	4	0	0	0		General issues: Please check the consistent use of acronyms across the chapter. The use of uncertainty language is much better compared to the FOD. However, there are still improvements necessary in some sections. Also the references to AR5 as starting point for this assessment are much better. But please try to be specific about AR5 chapters and citations referring to AR5. Consider linking better to relevant findings from SR1.5 (especially regarding 4.3 and 4.4). [Hans-Otto Poertner and WGII TSU, Germany]	Thank you. We have sought to use acronyms more sparely and consistently; cited specific AR5 chapters where appropriate; be more precise with uncertainty language, including use of the term deep uncertainty; and highlighted relevant SR1.5 findings where appropriate.
31171	4	0	0	0		The structuring of sections is still partly inconsistent across the chapter, e.g., the Antarctica section not being subdivided at all, contrary to most other ones. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted.
31173	4	0	0	0		Some regions are hardly mentioned: South America, Africa. Please check for available literature on these regions, and/or highlight knowledge gaps. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account by a concerted effort to source literature from under-represented regions, especially in relevant sections of 4.3 and 4.4.

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1811	4	0	0	0		General Comment: There are some pivotal issues around sea level rise and time series analysis that have been published in the scientific literature since AR5 that have not been covered in the SOD. From my perspective, these can be broadly framed into three (3) key themes: Firstly, whilst the sophistication of the science around sea level rise and projection modelling continues to gain pace, the application of overused, inappropriate and overly simplistic time series analysis techniques risk diminishing the scientific gains due to their coarseness. For example, the literature remains replete with the over use of linear regression techniques to determine mean sea level trends and the application of second order polynomials to estimate acceleration. Whilst convenient, neither are capable of accurately discerning the distinctly non-linear, time varying characteristic of mean sea level velocity, and in turn associated accelerations. The recent published works of Watson (2016, 2017a, 2018a), have substantially advanced these issues with more robust determinations of mean sea level and associated time varying velocities and accelerations. These techniques improve the detection of genuine velocities and accelerations in long ocean water level records directly associated with the increasing mass of the ocean having removed biases associated with internal climate mode forcings and other dynamic (cyclical) influences. Recently completed doctoral studies on the topic "Improved Techniques to Estimate Mean Sea Level, Velocity and Acceleration from Long Ocean Water Level Time Series to Augment Sea Level (and Climate Change) Research" (Watson, 2018a) applied sophisticated time series analysis techniques to the longest tide gauge records available around the USA (Watson, 2016) and Europe (Watson, 2017a) exceeding 80 years in length. The application of these techniques to the data rich margins of the USA and Europe provide an improved understanding of the spatial variations in velocity and accelerations of mean sea level at the regional level than has been previously available. The conclusions reached have far ranging implications and include: • Real-time measured velocity and acceleration provide an improved understanding of the time-varying properties of mean sea level; • The comparatively low time varying velocities and associated accelerations evident over the majority of historical records analysed, deem that acceleration is unwisely measured as a simple metric. Until such time as the apparent real-time velocities and accelerations in the mean sea level signal are sufficiently large not to be obscured by complex influences inducing decadal to multi-decadal variability and other background noise, the search for accelerations in these records require more intuitive, diagnostic considerations. For example, the search for acceleration is perhaps more practically inferred by considering whether or not peaks in the instantaneous velocity and acceleration time series are increasing, becoming more sustained or statistically abnormal (or different) over time in the context of the historical record. This type of approach will continue to be important until the extent of sea level rise (due to climate change) is	This remark has been addressed in the FOD
2297	4	0	0	0		Figure 4.2, 'High Tide' is shown, It is better to show as "Tidal height" , as like high tide, low tide is also a possibility [Unnikrishnan Alakkat, India]	we improved figure 4.2
2301	4	0	0	0		43 by 2100 under all RCPs, leading to severe flooding in the absence of strong adaptation [Unnikrishnan Alakkat, India]	unclear what is meant
2303	4	0	0	0		Please do not use 'common', instead, 'more frequent' may be used [Unnikrishnan Alakkat, India]	we think it is correct for the purpose
2305	4	0	0	0		In RCP8.5, many small islands and megacities will experience such events annually by 2050 [Unnikrishnan Alakkat, India]	language has been improved
2307	4	0	0	0		45 {4.2.3.4}. [Unnikrishnan Alakkat, India]	unclear what is meant

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2539	4	0	0	0		I note a very different writing style between the 'ice sheet parts' of Ch3 and Ch4; highly condensed in Ch3, with lots of confidence statements, while Ch4 is more a narrative, including frequent pre-AR5 citations, and much less confidence statements. Examples are section 4.2.3.1.2 Antarctica which goes on page after page; another example is section 4.2.2.1.1, which spends a page on ice sheet melt estimates during MPWP, to conclude that the confidence is low.... personally I like the style of Ch4 better, as it is more accessible for the non-specialist, but either way I urge the authors to make the writing style of the chapters more uniform. There is also considerable overlap between Ch3 and Ch4 when it comes to descriptions of mass loss from the Greenland and Antarctic ice sheets. Finally, many typo's and inaccurate formulations remain in the narrative-style Ch4, too many to point out here. There are also scientific inaccuracies in the part about ice sheets, see below [Michiel Van den Broeke, Netherlands]	Overlap with chapter 3 has been reduced, the Antarctic section has been trimmed, more confidence statements have been added
6137	4	0	0	0		Suggest remove "EG" frequently listed in the chapter. Meaning not clear [Nina Hunter, South Africa]	language has been improved
6279	4	0	0	0		Should "storm surge" at times be plural? Please check usage throughout chapter 4. [Nina Hunter, South Africa]	Storm surge when intended to be generic needn't be plural
6999	4	0	0	0		Large parts of this chapter do not seem to assess the literature but rather describe the literature. The most striking in this regard is pages 117 to 131 where for 15 pages there is no mention of “confidence” levels. Also pp. 35-38; 60-65; 88-92; 95-100; 111-115. Please consider the brief to assess the literature in these sections. [Nina Hunter, South Africa]	Accepted. Sections that were primarily descriptive have been removed or revised to assess relevant literature
21897	4	0	0	0		One omission in Chapter 4 on hazard and risk exposure is the high importance of using high-resolution and accurate coastal topography e.g. LiDAR, for hazard and risk/vulnerability assessments - compared with many studies including global ones that are based on less-accurate topography e.g. Shuttle Radar Topography Mission (SRTM). The NZ national exposure study outlined in row 42 of my comments comparing common areas with both LiDAR and SRTM, showed that the risk exposure is underestimated by half using the latter. This confirms a similar finding by Strauss & Kulp (2014): New analysis shows global exposure to sea-level rise. Research Report by Climate Central, USA. http://www.climatecentral.org/news/new-analysis-global-exposure-to-sea-level-rise-flooding-18066 [Robert Bell, New Zealand]	This issue is now address in 4.3.3.2
23183	4	0	0	0		I congratulate the authors for the second order draft. I have provided comments to the SPM that are relevant for executive summaries of all chapters. [Valerie Masson-Delmotte, France]	Thank you for this positive feedback
26237	4	0	0	0		Overall I think it does an excellent job of synthesising a huge amount of literature and opinion; providing a clear account of the progress made in assessment methodolgies and knowledge base, as well as highlighting oustanding gaps. [Katherine Yates, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for this positive feedback
27275	4	0	0	0		No comments [Gleyci Moser, Brazil]	thanks
29363	4	0	0	0		Add the reference paper i cited in the comments bellow: "Rabehi W, Guerfi M et Mahi H Cartographie de la vulnérabilité des communes de la baie d'Alger, Approche socio-économique et physique de la côte [Revue] // Méditerranée. - 2018. - Vol. Varia. - pp. 1-17" [Walid Rabehi, Algeria]	Thank you for bringing this paper to our attention. It is not possible to cite every post-AR5 paper related to SLR in our assessment. Your work has been noted but was not judged to be directly relevant to the focus in our assessment on emerging themes in risk assessment.

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31301	4	0	0	0		Please respect the original page allocations in the government approved outline. In the text please focus on the policy relevant issues and those aspects that help developing a clear, coherent and comprehensive picture, and condense textbook like or review elements simply describing the system under study. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in removal of descriptive or textbook-like material, and more focused attention on assessment of policy-relevant SLR literature. The revised chapter complies with the revised page limits agreed to at LAM4. Thank you for your comments.
31303	4	0	0	0		The executive summary gives a nice general, mostly qualitative overview but would be more punchy if key findings could be detailed (specified and quantified), also and especially with respect to solution options by adaptation and mitigation efforts. This would also help the development of the SPM as a stand-alone document. I have indicated where such question marks come up when reading the present ES. If quantitative statements are not possible for global scale they may still be possible for key regional examples (case studies). Providing semi-quantitative estimates or orders of magnitude would also help to understand better and e.g. differentiate between whether projected mean global or regional changes are by e.g. 5 or 95 %. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in substantial revisions to the ES statements which as far as possible are grounded in empirical and evidence-based assessments of relevant literature.
31647	4	0	0	0		Figure 4.1. This diagram needs further development to make it easier for the reader to navigate and properly understand the heriarchy and connections. For example, there are missing explanations on the meaning of line types (dashed, normal, thick brown, etc.), or box colors. With patience, a better rearrangement could be achieved in order to separate elements and properly group them based on relationship and to reduce to the maximum the amount of overlaps between lines. [Hans-Otto Poertner and WGII TSU, Germany]	Thank you - taken into account in the revised, simplified figure that more clearly communicates how elements of the chapter are constructed and related to one another.
31649	4	0	0	0		Figure 4.3. You could leave only one legend box applicable to both panels. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted
31651	4	0	0	0		Figure 4.3. Even if the figure ends up taking a bit more vertical space, it is preferable to have an equal scale for the Y axis. [Hans-Otto Poertner and WGII TSU, Germany]	Accpeted
31655	4	0	0	0		Figure 4.6. The text with a question mark within the figure is not addressed in the caption. I would recommend not to place speculative labels in the diagram, unless they arre properly addressed in the caption. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted
31657	4	0	0	0		Figure 4.11. Seems that this line is starting with missing text following the previous line. [Hans-Otto Poertner and WGII TSU, Germany]	Corrected
33525	4	0	0	0		Chapter does a good job bringing together the physical science, socio-ecological vulnearbility, impacts and responses, broadly covering latest updates. [Government of United States of America, United States of America]	Thank you for this positive feedback

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33527	4	0	0	0		Cultural heritage is largely missing from this chapter. While section 4.3.2.4.2 importantly addresses indigenous and local knowledge, it does not include the vulnerability or adaptation of cultural heritage sites to inundation by SLR or increased erosion, including historic structures and archeological sites. An additional section to summarize this topic could fit in 4.3.2.4 (Other Human Dimensions) or on p.81 lines 11-14 or in 4.3.3.6.4. An example of decision support for adaptation for cultural heritage could fit under section 4.4.4.3.3. Potential references include ch. 5 of Beavers, R.L., A.L. Babson, and C.A. Schupp [eds.]. 2016. Coastal Adaptation Strategies Handbook. NPS 999/134090. National Park Service. Washington, DC. or Fatoriƒá, S., and Seekamp, E. 2017. Assessing Historical Significance and Use Potential of Buildings within Historic Districts: An Overview of a Measurement Framework Developed for Climate Adaptation Planning. AG-832. Raleigh, NC: NC State Extension. [Government of United States of America, United States of America]	Noted. Whilst cultural heritage is an important issue in context specific situations, it is one of many significant social values at risk from SLR - as highlighted in section 4.3.3.6.4. The limited word count allotted to this chapter did not permit assessment of many context specific considerations, including cultural heritage. Nonetheless, our assessment highlights the imperative to take into account cultural concerns and other social values in assessing the merits of alternative SLR response interventions (4.4.2).
9581	4	1	0	0		General remarks on uncertainties and SLR projections The reports points out in several sentences all the uncertainties surrounding the future response of Antarctica and Greenland to global warming. Yet, in the end (section 4.2.3.2) the report provides only a likely range of future Antarctica contribution to SLR, without a clear overview of what the high end of the distribution might be. Contrasting with the middle range of +35 cm in 2100 for RCP8.5 (Table 4.2) a presentation at AGU 2017 from Deconto & Pollard stated that “at the high end, the new results show the potential for more than 2 m of global mean SLR by 2100” (abstract #C43A-05, AGU Fall meeting 2017). Moreover, as explained in the NOAA technical report on global and regional SLR for the US (Sweet et al., 2017), providing central projections may be sufficient to address near-term planning needs, however, they are typically insufficient for many decisions, especially planning concerning long-life critical infrastructures. Decision-makers may need to consider the risks across a broad range of possible outcomes, including those associated with high-consequence, low-probability situations. Therefore, the NOAA chose to consider an extreme scenario of +2m SLR in 2100 [Government of France, France]	This topic is addressed in the new section 4.1 and comes back in the ES statements
9583	4	1	0	0		The processes governing the ice-sheet behavior which are still poorly understood or underconstrained are mentionned in the main text, but the information is very dispersed. It could be gathered in a specific box, providing a list of the processes, explaining which ones are currently taken into account in models and explaining the different uncertainties and the potential positive or negative feedbacks on future ice loss. Thus, the reader could have a better picture of all the sources of uncertainties concerning future SLR and whether they point to globally toward higher or lower risks than presently understood. [Government of France, France]	There is a cross-chapter box on ice dynamics together with chapter 3

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9585	4	1	0	0		The report could also discuss the findings of Blanchon et al. (2009), showing a 2-3m SLR at the end of the Eemian within an ecological period, suggesting that a very rapid ice sheet destabilization could be possible, even if we currently do not fully understand the physical mechanisms that could trigger such an evolution. A recent paper in discussion by Shannon et al. also puts an upper bound on the global glaciers volume loss of 247 mm sea-level equivalent by the end of the century, i.e. much higher than the values in Table 4.3. Blanchon, P., Eisenhauer, A., Fietzke, J., & Liebetrau, V. (2009). Rapid sea-level rise and reef back-stepping at the close of the last interglacial highstand. Nature, 458(7240), 881. Keegan, K. M., Albert, M. R., McConnell, J. R., & Baker, I. (2014). Climate change and forest fires synergistically drive widespread melt events of the Greenland Ice Sheet. Proceedings of the National Academy of Sciences, 111(22), 7964-7967. Shannon, S., Smith, R., Wiltshire, A., Payne, T., Huss, M., Betts, R., ... & Harrison, S. (2018). Global glacier volume projections under high-end climate change scenarios. Cryosph. Discuss. Stibal, M., Box, J. E., Cameron, K. A., Langen, P. L., Yallop, M. L., Mottram, R. H., ... & Remias, D. (2017). Algae drive enhanced darkening of bare ice on the Greenland ice sheet. Geophysical Research Letters, 44(22). Sweet, W. V., Kopp, R. E., Weaver, C. P., Obeysekera, J., Horton, R. M., Thieler, E. R., & Zervas, C. (2017). Global and regional sea level rise scenarios for the United States. Tedesco, M., Doherty, S., Fettweis, X., Alexander, P., Jeyaratnam, J., & Stroeve, J. (2016). The darkening of the Greenland ice sheet: trends, drivers, and projections (1981–2100). Cryosphere (The), 10, 477-496. Tedstone, A. J., Bamber, J. L., Cook, J. M., Williamson, C. J., Fettweis, X., Hodson, A. J., & Tranter, M. (2017). Dark ice dynamics of the south-west Greenland Ice Sheet. Cryosphere,	Due to page constraints we reduced the discussion of paleo sea-level
22495	4	1	0	131		Suggest that if Cross-Chapter Box 7 is to be a standalone box perhaps a more explicit reference to the box should be included, stating its relevance to the chapter and its purpose - otherwise it may have the potential to be overlooked by readers. [Government of Australia, Australia]	There are several cross references to the cross-chapter box on ice dynamics in chapter 3
2611	4	1	0	174		Overall the chapter is now in good form. I am happy to see that in this version more details are provided in section 4.2.3.4.3 on the Effects of cyclones. So no more changes required. [Pushp Raj Tiwari, United Kingdom (of Great Britain and Northern Ireland)]	Thank you for this positive feedback
4013	4	1	0	174		A combination of important and latest references on the research findings are cited and discussed, provide a more complete and overall view to the scenario of the issue discussed, which is good and professional. [Lim Lee-Sim, Malaysia]	Thank you for this positive feedback
32075	4	1	1	0		I miss a discussion on the life time of investment to adaptation. For this it would also be useful if more information is given on sea-level rise beyond 2100. For example zoom in on figure 4.11 for the period until 2150 [Marjolijn Haasnoot, Netherlands]	Taken into account. Thank you for this observation. The section on decision analysis methods explicitly addressed the timeframe of investment decisions and assesses the contributions different methods in making long term decisions.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2195	4	1	1	1	1	Since AR5, there had been some studies on the future sea level extremes associated with Large spring tides. In a future scenario of sea-level rise, large tides could cause increased flooding. This has been reported particualarly in the United States, I can include below a few refernces. I could not find referncing [Unnikrishnan Alakkat, India]	Thank you for the feedback this is a topic which is not really treaerd in depth in the chapter
2311	4	1	1	1	1	of this aspect in the text. Sweet, W.V., R.E. Kopp, C.P. Weaver, J. Obeysekera, R.M. Horton, E.R. Thieler, and C. Zervas, 2017: Global and Regional Sea Level Rise Scenarios for the United States. NOAA Technical Report NOS CO-OPS 083. NOAA/NOS Center for Operational Oceanographic Products and Services. 75 pp. 2.Sweet, W.V., R. Horton, R.E. Kopp, A.N. LeGrande, and A. Romanou, 2017: Sea level rise. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 333-363, doi: 10.7930/J0VM49F2. 3.Sweet, W., J. Park, J. Marra, C. Zervas, and S. Gill, 2014: Sea Level Rise and Nuisance Flood Frequency Changes around the United States. NOAA Technical Report NOS CO-OPS 073. 58 pp. [Unnikrishnan Alakkat, India]	see 2195
28239	4	1	1	2	7	It seems odd that neither Greenland nor glaciers outside the ice sheets are mentioned in this part, both in terms of current and projected rates. [Martin Truffer, United States of America]	Accepted both Greenland and mountain glaciers now discused in the ES.
28405	4	1	1	50	50	See comment 1 above about acronym for GrIS. [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	Noted - to be addressed in final proofing
26135	4	1	1	54	57	All 'ice' parts are extremely well written and easy to read, however, the style is in general more like a review paper. I miss more assessment with confidence language. At the moment is seems like just one study after the other are summarized, rather than 'assessing' the literature. Perhaps details of some of these models can go into a supplementary table; or these parts can be at least condensed? [Regine Hock, United States of America]	Accepted - we have improved the style, made it more consistent and added many confidence statements
26091	4	1	1	131	30	Acronyms should be avoided as much as possible and in particular in the executive summary, but also elswhere. IPCC reports are often not read from start to end and it makes the report/chapter less readable if one has to flip back and forh. The chapter should be readable for readers who are not in the field and familiar with LIG, ESL, MICI, RSL, SIDS, MPWP, TC, ETC … and many more. In many instances one can simply rephrase or use a shorter spelled out version when the context is clear. [Regine Hock, United States of America]	Noted, the use of acronyms has been reduced and is now more consistent throughout the chapter.
10399	4	1	1	174	60	The overall general comment on this chapter is that this chapter has not adequetly addressed the specific case of low lying islands particulalry small islands therefore it is suggested to include more on the small cases of low lying small islands particulalry in the context of adaptation [Mahmood Riyaz, Maldives]	Noted. The implications of SLR for small islands, and low lying small islands in particular is profound. This is highlighted throughout the chapter, including in Executive Summary statements, impacts of SLR (e.g., 4.2.3.4) as well as a case study on Nadi, Fiji. There is also a Cross Chapter Box on low lying islands (CCB9).

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17235	4	1	1	174	60	As a general comment for Chapter 4, there are many grammatical mistakes and typos within this chapter. The chapter should certainly be read through and edited very carefully to amend all of the grammatical issues before publication. [Andra Garner, United States of America]	Noted and taken into account in finalising chapter for publication.
17237	4	1	1	174	60	Is there a plan to place links to various sections throughout the final document? If not, there needs to be. The constant 5-decimal point references to different sections and paragraphs throughout this chapter is not only tedious and disruptive to the flow of the discussion, but would likely require a reader to keep notes for which section they were searching for. Making each section reference a link that would allow the reader to click on it to go to that section would be very helpful. [Andra Garner, United States of America]	Noted and taken into account in finalising the chapter for publication.
11359	4	1	2	174	59	I have focused my comments of this chapter on sections (4.1 and 4.2) I'am relatively familiar with (I was review editor of the sea-level chapter in WK1 AR5). And my comments are indeed very limited as I feel that the document is aleady of excellent quality both in its organisation, its content and its writing (I would say of much better quality that expected at this stage of the process). I would like to congratulate the author team. [jean jouzel, France]	Thank you.
4011	4	2	0	5		The content flow and presentation of this chapter has improved in comparison to the first draft (based on the Executive Summary). Well done! The final part of the chapter involve in discussing some suggestion of solutions to the impacts brought by sea level rise, so not sure if the word "solutions" need to be included in the title of this chapter? [Lim Lee-Sim, Malaysia]	Thank you. We have revised the concluding sections and used enablers and lessons learned to describe insights from real-world experience. The chapter title is as provided in the approved outline.
5185	4	2	0	5		ES is light on figures re: impacts, responses and related costs [Debra Roberts and Durban Team, South Africa]	Noted. The ES is made up of statements, not figures. We have included figures / tables where they materially inform readers.
13891	4	2	0	5		The Executive Summary should include mention of the large differences that can arise between global mean sea level and regional/local sea level. In particular, there are additional processes that come into play and both the central estimates and uncertainty can show large differences to GMSL in the future projections. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised statements in the ES.
21789	4	2	0	83		Various uses of SLR rate e.g. mm/yr, mm/year, mm yr-1, cm yr-1 (e.g. line 6, page 83) [Robert Bell, New Zealand]	Noted. To be addressed in finalisation of chapter for publication.
31175	4	2	1	0		The Executive Summary is rather unbalanced, with a focus on physical drivers and responses, but little on impacts and vulnerability. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in wholly revised and updated ES statements.
10299	4	2	1	5	19	Sice this chapter is about the SLR implications for low lying islands, it is recommended to have one para on the specific implications for Small island rather than to be general [Mahmood Riyaz, Maldives]	Noted. To fully reflect the significant implications of SLR for low lying islands, the approach adopted is to address implications throughout the chapter, including in sections on SLR impacts and risks, and responses.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11541	4	2	1	5	19	The Executive Summary of this chapter needs to note how sea level rise is likely to affect coastal and (especially) small-island aquifers. In some cases seawater intrusion is likely to be another effect on the habitability of some low-lying coastal environments in addition to direct inundation, so this is a crucial issue. [William Howard, Australia]	Taken into account - salinization is explicitly spotlighted in an ES statement and has a whole section devoted to this topic (4.3.3.4).
22493	4	2	1	5	19	Suggest the Executive Summary note how sea level rise is likely to affect coastal and (especially) small-island aquifers. In some cases seawater intrusion is likely to be another effect on the habitability of some low-lying coastal environments in addition to direct inundation, so this is a crucial issue. [Government of Australia, Australia]	Repeat of 11541
27855	4	2	3	3	7	Would it be possible to include a brief discussion at the beginning of this section explaining the physical phenomena that contribute to SLR? You discuss subsidence but not thermal expansion, ice sheet melt. It would be very easy to include that in the first para. [Ko Barrett, United States of America]	Thank you. Taken into account in revised Introduction that briefly explains key physical elements responsible for SLR.
15039	4	2	3	5	19	Please provide consistent confidence language throughout the ES. Many of the paragraphs seem to have a final phrase that is left without qualification, even though they carry relevant messages, and some (e.g. 8, 10, 13) don't have any confidence qualifiers apart from the headline statement. We'd strongly encourage to revise and reformulate the ES in a way that allows for clear assessment of confidence in the statements made. [Government of Germany, Germany]	Taken into account in finalisation of ES statements, and in chapter as a whole.
15041	4	2	3	5	19	One of the key messages of SR1.5 is the potential crossing of a tipping point between 1.5C and 2C for potentially irreversible Antarctic Ice Sheet Disintegration and Deglaciation, and associated (long term) SLR. While we are aware that this topic is also part of Chapter 6 and 3, and may be taken up there, we'd expect at least a reference in the ES of chapter 4 for clarity. [Government of Germany, Germany]	Accepted and now discussed amply in 4.2.
15043	4	2	3	5	19	At least from the ES it seems that this chapter does not explore the full range of the Paris Agreements long term temperature limits (1,5C, well below 2C), as it does not represent findings from the SR1,5 report or results for RCP1,9. Please incorporate information pertinent to RCP1.9 and include reference to central findings of the IPCC SR1,5 where appropriate. [Government of Germany, Germany]	We can only assess literature as it is. Relevant papers assessed do not use RCP 1.9 for modeling SLR. In addition, a scan of SR15 finds no mention of it.
2463	4	2	5	0	6	Observations do not show sea level will continue to rise for centuries [John Church, Australia]	Accepted and corrected.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27849	4	2	5	0	6	Observations show that GMSL will continue over many centuries? Do we mean to say observations and associated projections? [Ko Barrett, United States of America]	Accepted and corrected
4661	4	2	5	0		Exec Summ: Remove acronyms GMSL, LIG, ESL, MICI, RSL, SDG. Only retain SLR as it gets used often. [Debra Roberts and Durban Team, South Africa]	Noted. To be addressed in finalisation of chapter for publication.
4663	4	2	5	0		Surely GMSL cannot accelerate, only SLR can? Also, will the acceleration continue, or the rise? (i.e. will SLR continue or continue to speed up?) Suggest rewording "global mean sea level rise (SLR) is accelerating and will continue (to speed up?) over many centuries" [Debra Roberts and Durban Team, South Africa]	we think the text is appropriate
15113	4	2	5	2	5	Scentence suggestion: "...rising at an accelerating pace" instead of "...rising and accelerating". [Sofie Schöld, Sweden]	we think the text is appropriate
21999	4	2	5	2	5	GMSL can rise, but that rise is acceleratiing, not GMSL itself, as suggested by the sentence. [David Schoeman, Australia]	we think the text is appropriate
3675	4	2	5	2	7	This conclusion fails to fully consider the contribution of thermal expansion of seawater, and it is inconsistent with P17 -- 4.2.2.3.1 in the report to evaluate the confidence level as "very high". [Juncheng Zuo, China]	The statement merely asserts than changes in water mass now are now a greater contribution to SLR than thermal expansion. This is discussed in 4.2.2.3.1 where the wording on this point is clearer.
13879	4	2	5	2	7	Executive Summary: first dot-point. In the bold text, be explicit about mass loss from glaciers and ice sheets being the dominant contribution to sea level rise. It may be even clearer to state this as "mass loss from land-based ice" is now the dominant source of sea level rise. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	We have clarified the wording but kept the use of glaciers and ice sheets in order to be specific.
13893	4	2	5	2	7	Polar Ice Sheets' for consistency with other text, does this refer to the Greenland and Antarctic Ice sheets? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	We do not think capitalization is needed. Yes, polar ice sheets refers to the two Antarctic and one Greenland ice sheet. We chose not to take space to mention three names.
19641	4	2	5	2	7	It is unclear if the confidence given in line 7 (very high confidence) is for the second sentence only (Glaciers and polar ice sheets are now the dominant source of sea level rise.), or if it is applicable for the first sentence as well. As is given on page 17 line 11, the confidence for an acceleration can be given with "high confidence" only, not with "very high confidence". I propose to rethink if seperate confidences can be given for the first sentence as well, as they are given in the Section itself. [APECS Group Review, Germany]	Accepted and clarified.
23933	4	2	5	2	7	It is also suggested mentioning thermal expansion as a source of sea level rise in accordance with subsections 4.2.2.3 and 4.2.2.6. [Government of Japan, Japan]	The objective is to mention new findings. Thermal expansion referred to in ES under Projections.
28235	4	2	5	2	7	This needs to be reworded. Observations don't show that sea level will continue to rise for centuries, as the current text implies. [Martin Truffer, United States of America]	Corrected.
29065	4	2	5	2	7	Suggest more clear and "headline" message, perhaps: "Observations show that global mean sea level (GMSL) is rising, and that rates of sea-level rise are accelerating. Due to long response times, GMSL will continue to rise over many centuries, but at lower rates under low emissions scenarios." [Pam Pearson, Sweden]	text of this ES statement has been improved

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
1571	4	2	5	2	15	I was expecting to find a quantitative statemet here about observed sea level rise (here or in bullet 2). [Matthew Collins, United Kingdom (of Great Britain and Northern Ireland)]	Accepted and added.
13895	4	2	5	2	15	It would be useful to include a sentence as a conclusion on what the past sea levels tell us for the current period and future potential sea level rises. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	A new bullet inserted containing paleoclimate information but the conclusion is that limited insight can be draw from this.
16487	4	2	5	2	15	the main text of this bullet is entirely disconnected from the bold introductury sentences. Weheras the first two sentences rise expectations to read abeout the present day amount and aceleration of sea level rise, the text exclusively deals with palaeo information. I suggest to make two ExSum bullets dealing with these two issues separately. [Georg Kaser, Austria]	Accepted and edited accordingly included a separate paleoclimate bullet.
19625	4	2	5	2	15	This summary is about observed evidence of global sea-level rise. However, the given evidences in line 5-15 are about sea-level rise at the deep past and their comparision to today's SLR. The paleo SLR are neither direct observations nor evidence of present SLR. I suggest to give directly evidence of SLR during the instrumental period as shown in Section 4.2.2.2 and Section 4.2.2.3. For the paleo SLR, it's better to have another summarize items with mentioning the differences of SLR in the past and today, and also the difference of dominat mechanisms. [APECS Group Review, Germany]	see response to comment 16487
22033	4	2	5	2	15	The first point should be separated in two points focusing on contemporary sea level changes (L5 to 7) and the analogy with past sea level changes (L7 to 15). Thermal expansion should also be mentionned as a dominant source of GMSL rise, as its contribution varies from 1/3 to 1/2 of the total GMSL rise depending on the time period and method considered. [Julia Pfeffer, Australia]	see response to comment 16487
23185	4	2	5	2	15	Replace "differences in incident solar radiation"... but : "but different implications of orbital configuration changes versus changes in atmospheric greenhouse gas concentrations ... What is missing is a comparison of the magnitude of polar warming in both cases (not global warming), as the links between global and polar T differ in response to GHG and in response to orbital configuration changes. [Valerie Masson-Delmotte, France]	point rewritten.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
25847	4	2	5	2	15	The text in bold characters concerns present observations and (marginally) future trends, while the following text concerns only remote past observations. The highlighted text is thus not directely related to the text of the paragraph. This paragraph might be splitted in one concerning present observations and the second remote past observations. As a proposal, in the first one, some complementary material on the quantification of the contributions to sea level rise extracted from section 4.2.2 (and in particular Table 4.1) could be added. In the second, the first sentence could be highlighted in bold characters. [Serge PLANTON, France]	see response to comment 16487
28391	4	2	5	2	15	I have a little bit of concern with the way this statement is pitched. First, the driver of the change was insolution not CO2 so to make a direct comparison is misleading. The way it is currently phrased does not make that clear. Second, summertime temps in the Arctic may have been 3-5 degs warmer than preindustrial (Otto Blesiner) for multiple millennia so the comment about global temps is again a bit misleading for the NH at least. [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	Accepted and addressed with a new bullet on paleoclimate

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29709	4	2	5	2	15	Generally well said, though I think there are additional period to draw upon. That sea level was 120 meters lower at Last Glacial Maximum when the reconstructed depression in global average temperature was of order 6 C, suggests something like 20 meters per degree C. Going back a few tens of millions of years and there was certainly no Greenland ice sheet and apparently not an Antarctic one, and the temperature was perhaps up 4 C or so; with 70 m of sea level tied up in these ice sheets, it is of order perhaps 15 m per degree C (at equilibrium). There are no indications that I know of that go lower than say 10 m per degree C, and yet the Paris Accord and 1.5 C report suggest stabilization at 1.5 C is what to be aiming for--well, that seems very problematic to me and not at all a precaution-based proposal. For 120 centuries (20ka to 8ka), sea level rose on average a meter per century when the global average temperature was rising at something like 1 C per 2000 years--we will be warming at 1 C per 50 years and the CO2 concentration, and so IR influence, will be over 400 ppm instead of less than 300 ppm. Thus, the notion that sea level rise will be at a rate less than a meter per century when the ice sheets are looking as vulnerable as they are just does not seem justified to me. Yes, there are many uncertainties and scientists was to have high confidence in their findings, but there are huge risks here and it seems to me the scientific community needs to be much more forthright on the risks involved, for they are, with respect to the ice sheets, pretty clearly irreversible--the glacial-interglacial cycling makes clear ice sheets collapse much, much faster than they build up. I thus think the latter part of this finding is too cautious and the available data and analyses would justify, using a risk-based framing for drawing conclusions, indicating that the rates of rise in sea level could be substantially over 1 m per century, thus posing very serious threats to coastal cities and communities around the world than has been conveyed in earlier IPCC reports. [Michael MacCracken, United States of America]	We present the paleoclimate evidence that is new (which LGM evidence is not) and most pertinent, to a warmer period.
31177	4	2	5	2	15	The headline statement and the supporting text have a somehow different message. While the HS makes the important point that SLR will continue, the underlying text stresses that what we know about past changes is very uncertain. [Hans-Otto Poertner and WGII TSU, Germany]	see response to comment 16487
8627	4	2	5	2	45	As for sea level rise (SLR) see comment above. [Vladimir Konovalov, Russian Federation]	comment not understood.
2465	4	2	6	0		It is the Sum of of ice sheets and glaciers that are dominant - either one on its own is not dominant. [John Church, Australia]	yes this specification is better than the original text
2051	4	2	6	2	6	Compared to thermal expansion of sea water, it is overstated that 'glaciers and polar ice sheets are the "dominant" source of sea level rise'. Use a more appropriate word. [Akio Kitoh, Japan]	We disagree - see table 4.1

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15649	4	2	6	2	7	"now" is in fact since 2005, and uncertainties associated with contributions from different sources ought to make for a more careful analysis regarding broad sweeping statements like these (thermal expansion in particular, and given the uncertainties below 2000m). [EUCE, Belgium]	We rephrased the sentence slightly to express that it is about the sum of glaciers and ice sheets, we did not specify a year as that is somewhat arbitrary
29997	4	2	6	2	7	This sentence is ambiguous and could be interpreted as the individual components being larger than all other components such as thermal expansion. Could be changed to "The mass loss from glaciers and polar ice sheets is now the dominant source of sea level rise". [Ronja Reese, Germany]	We rephrased the sentence slightly to express that it is about the sum of glaciers and ice sheets
23935	4	2	7	2	11	"these polar ice sheets contributed 6-9m to sea level above present-day" seems to be inaccurate in light of subsection 4.2.2.1.2.; and therefore suggest mentioning that the contributions from polar ice sheets are uncertain as stated in the page 15 (lines from 42 to 45). [Government of Japan, Japan]	Text and ES are now in agreement
11079	4	2	7	2	14	The logic of the sentence is confused. The purpose is to make clear that the correlation between average temperature and sea level is not trivial, because among other phenomena difference in the incident solar radiation has a relevant impact. But this is expressed comparing completely different epochs, without providing a reasoning line easy to follow [Valentina R. Barletta, Denmark]	Rewritten - see response to comments 16487
15585	4	2	7	2	14	The logic of the sentence is not clear and may create confusion. The purpose is to make clear that the correlation between average temperature and sea level is not trivial. However, it is very difficult to follow the logic of the caveats. In particular, the uncertainty disclaimer at the end of the paragraph would appear to undermine the high confidence at the start. Please consider the simplest argument this statement attempts to communicate then reconstruct the paragraph accordingly. [EUCE, Belgium]	see response to comment 16487
2131	4	2	8	2	8	I would consider whether the Last Interglacial record is strong enough to support 'high confidence' in the 6-9 m range, especially since one of the key sources for this range (Kopp et al. 2009) allowed a 33% probability of a transient high stand in excess of 9.4 m, and subsequent concerns raised, for example, around mantle dynamic topography could also add some imprecision to the analysis. [Robert Kopp, United States of America]	we rephrased the sentence, left out the temperature from the assesment and made a statement about higher values
4665	4	2	9	0		"…warmer than preindustrial time" Suggest adding: ", which corresponds to current conditions". [Debra Roberts and Durban Team, South Africa]	we prefer not to be to precise due to uncertainties in the baseline

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4667	4	2	10	0		What differences? Are they higher or lower today? [Debra Roberts and Durban Team, South Africa]	The wording differences is ambiguous and has been removed
11537	4	2	10	2	11	"differences in incident solar radiation between the LIG and today complicate the relationship between past temperature change and sea level." This is incorrect. Reword to "differences in the Earth's orbital geometry between the LIG and today complicate the relationship between past temperature change and sea level." Or it could read differences in the seasonal and latitudinal distribution of solar radiation between the LIG and today complicate the relationship between past temperature change and sea level." This is an *IPCC report* and will be pointed to as an authoritative source on climate science; it is vital to get this right! [William Howard, Australia]	Rewritten including a new paleoclimate bullet - see response to comments 16487
22497	4	2	10	2	11	Suggest rewording this statement to be more accurate. Suggest changing to "differences in the Earth's orbital geometry between the LIG and today complicate the relationship between past temperature change and sea level." Or it could read "differences in the seasonal and latitudinal distribution of solar radiation between the LIG and today complicate the relationship between past temperature change and sea level." Currently, it states that "differences in incident solar radiation between the LIG and today complicate the relationship between past temperature change and sea level." which is incorrect. [Government of Australia, Australia]	see response to comment 11537
29067	4	2	10	2	11	Given that this is the ES, for policy-level readers is it possible to better explain the import and meaning of this statement, “However, differences in incident solar radiation between the LIG and today complicate the relationship between past temperature change and sea level.” This reference is too vague; eg, use a term or describer that defines “incident solar radiation” more clearly; and what exactly is the “difference” noted that (the sentence implies) means that we may not be locked into the 6-9m SLR from glaciers and ice sheets that characterized the LIG even though we have now exceeded 1 degree. [Pam Pearson, Sweden]	See response to comment 11537
19627	4	2	11	2	13	There is probably an error with the "LIG" because the sentence speaks about MPWP. I suggest to change with " during the MPWP (high confidence)". [APECS Group Review, Germany]	see response to comment 11537

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31305	4	2	13	0	14	There seems to be an overemphasis on deep uncertainty and the wording is neutralizing the last high confidence statement. What if you say e.g.: With deep uncertaintly, sea level ranged up to 15? m above present levels (low confidence). ... to continue the line of thought. [Hans-Otto Poertner and WGII TSU, Germany]	See response to comment 11537
29069	4	2	13	2	13	Use of actual figures is important here: suggest, "...(high confidence), at least 9-12 meters above present day, but the maxium level remains deeply uncertain, with maximum estimates ranging from 20-30 m." [Pam Pearson, Sweden]	See response to comment 11537
13881	4	2	13	2	15	I would question whether phrases such as "deeply uncertain" and "very uncertain" useful here? Is it possible to give some indication of the range of maximum sea level during the LIG? That would at least include some information for the reader. The sentence that reads ".. remains very uncertain" could be re-framed as saying that "past ice-sheet mass changes can provide little constraint on projections of future sea level rise due to the large uncerainties". [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	See response to comment 11537
19635	4	2	17	2	17	The text says that human activity has been the cause of global mean sea level rise since 1970. My comment is about the date: is it from the year 1970 or from the 1970s? [APECS Group Review, Germany]	
13887	4	2	17	2	20	Words "envisioned" and "sharply" could be removed to improve the clarity of this sentence. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	THESE TERMS REMAIN IN ES 11
22035	4	2	17	2	20	Mention the mechanisms linking global mean sea level rise to human activity (warming of the ocean and the atmosphere causing ice melting and thermal expansion) [Julia Pfeffer, Australia]	Taken into account - these terms and related physical processes are mentioned in the Introduction (4.1)
13883	4	2	17	2	24	Since we are talking about Global Mean Sea Level Rise, it would be clearer to introduce the abbreviation GMSLR here rather than SLR (it appears later on page 8, with no definition). [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Rewritten

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13885	4	2	17	2	24	The bold text in this summary dot-point needs further consideration and possibly re-wording. The issue concerns the dependence of sea level rise at 2100 on emissions scenario. The sentence could be interpreted as the authors having "high confidence" that the Antarctic contribution is strongly dependent on emissions scenario. I would not support this statement (the evidence for this is based on very few studies and many key processes for ice sheet modelling are still based on parameterisations and limited understanding). The authors refer frequently to the "deep uncertainty" associated with the future ice sheet response and therefore this seems to be a contradiction in the report. There may still be, however, high confidence in the scenario dependence, due to the other scenario-dependence of the other sea level terms. If this is the case, it needs to be better delineated. I believe that the advances in understanding of the ice-sheet contributions and the remaining uncertainties warrant a separate dot-point in the Executive Summary. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Statement rewritten entirely, point addressed.
15653	4	2	17	2	24	This statement is poorly constructed. RCP is a greenhouse gas concentration trajectory - not emissions scenarios. The sentece mixes both concepts as if they were one and the same. In view of this, and in particular the addition of Antarctica, and RCP8.5 at the end of the sentence does not make sense and appears out of context. It needs revision. [EUCE, Belgium]	Statement rewritten entirely, point addressed.
16489	4	2	17	2	24	Also this bullet mingles diffrent aspects. While the first sentence (and eye-catcher) rises expectation to further read about the human impact on sea level rise, "only" future scenario statements follow. The latter also seem rather arbitrarily set. [Georg Kaser, Austria]	see response to comment 15653
3677	4	2	17	2	26	The conclusions of the two paragraphs (line18-19 and line25-26) are contradictory. Uncertainty/reliability level of the contribution of the Antarctic ice sheet under the high emission scenario? [Juncheng Zuo, China]	see response to comment 15653
23187	4	2	17	2	32	Storyline to be improved. Antarctica contribution under RCP8.5 referred to in 2 while explained in 3. RCP scenarios to be explained and linked with levels of global warming (needs coherency across ES as they will form a technical summary together). [Valerie Masson-Delmotte, France]	Accepted and reorgnaized accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31309	4	2	18	0	19	This constrains Antarctica's contribution to RCP8.5 which I find hard to believe, esp. in light of multi m sea level rise developing beyond 2100 as well as the likey temperature range of tipping point. [Hans-Otto Poertner and WGII TSU, Germany]	see response to comment 23187
31307	4	2	18	0		Suggest adding the timeline beyond immediately as the present writing will soothe the message to policymakers about the challenges ahead. [Hans-Otto Poertner and WGII TSU, Germany]	See response to comment 23187
15651	4	2	19	2	19	Global emissionS scenario [EUCE, Belgium]	paragraph rewritten
19637	4	2	19	2	19	The beginning and end of the sentence are inconsistent. The first part of the sentece refers to emission senarios while the second part refers to the contribution of the Antartica Ice Sheet. I suggest to change the last part of the sentence from "(…), particularly as a result of Antarctica's contribution under RCP8.5" to "(…), and by the contribution of Antartica under RCP8.5". [APECS Group Review, Germany]	paragraph rewritten
29999	4	2	19	2	19	Please explain 'high confidence'. [Ronja Reese, Germany]	High confidence refers to understanding of an issue in which there is robust evidence and high agreement amongst scholars.
29073	4	2	22	2	23	Suggest adding, "...are small, but thse differences become discerable in the latter half of the century and become even more evident in longer time frames (decades to centuries beyond 2100)." [Pam Pearson, Sweden]	the text has been rephrased to clarify
15045	4	2	23	2	24	Here you indicate that differences in SLR until 2050 are small between the RCPs. In para 5 ln 44ff you state that extreme sea level events will be experienced annually under RCP8.5. While not strictly a contradiction, those two statements should be better aligned - clarifying whether or not there is a significant difference in ESL events by 2050 between the scenarios discussed here and in para 5. [Government of Germany, Germany]	see response to comment 29073
9587	4	2	24	2	24	4.2.1.2 refers to Glaciers and seems not to be the intended section. [Government of France, France]	corrected
16525	4	2	24	2	24	Perhaps anthropogenic is implied here? Could be stated explicitly if so. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	Statement deleted
19643	4	2	24	2	24	The reference to section 4.2.1.2 is not a correct reference for the executive summary point 2) (line 17-24). The reference to the section discussing the emission scenarios is missing (Section 4.2.3). [APECS Group Review, Germany]	corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29711	4	2	24	2	24	Might I urge changing this to "primarily attributed" given that climate change induced sea level is clearly contributing to at least some of the change. Actually, in fact, it is the top little bit of change that climate is causing, and it is this part that can contribute to causing the greatest impact because it can cause a significantly increase chance of exceeding a design standard. Consider Hansen et al.'s shifting Gaussian curves of summer average temperature anomaly, and what was once a 1 in 1000 warm event is now occurring more than 10% of the time--and yet the warming amount has not been very long as exceeding the variability). Indeed, I'd guess that the situation is similar for sea level rise, so with respect to impacts, the climate-induced sea level change contribution may well already be quite significant. Yes, the fifth finding makes clear the current situation will not persist, but it seems to me the last sentence here is overstated and that though we might not yet be able to pin it down statistically, there is a high likelihood that human influences are already playing a role. [Michael MacCracken, United States of America]	Statement deleted
27851	4	2	25	0	32	Is it possible to delete this dense, numerical, medium confidence paragraph given that the main point is captured nicely in the paragraph before? [Ko Barrett, United States of America]	Accepted and statement deleted
27439	4	2	25	0		One of the headings in the executive summary should state total sea level projections. Point 3) is provides total sea level projections, but the heading is misguiding. [Matthias Mengel, Germany]	Accepted
27441	4	2	25	0		A reference to total sea level projections needs to be included. [Matthias Mengel, Germany]	Accepted
27037	4	2	25	2	26	I am concerned about this conclusion. I am not convinced that it is a correct assessment of the literature. See comment on page 41 lines 5-17. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	this has been rephrased and the assesment itself has changed and strengthened
28237	4	2	25	2	26	This is perhaps a question of wording, but the models show with high confidence that the likely sea level rise is several decimeters. [Martin Truffer, United States of America]	see 27037
30061	4	2	25	2	26	Please specify why the confidence is “medium”, given that two modelling studies are used to derive sea-level estimates and that there is low agreement on the MICI mechanism and low evidence of its occurrence (Cross Chapter Box 6, page 58, line 14-15)? [Ronja Reese, Germany]	we now have six models, see 27037
2133	4	2	25	2	32	I would argue this key message puts too much emphasis on the median values, and would suggest showing on the likely ranges here. [Robert Kopp, United States of America]	rewritten entirely, eliminate relevance of comment

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10211	4	2	25	2	32	In this Special Report, the Antarctic Ice Sheet's contribution to global sea level rise in 2081-2100 under RCP8.5 is updated to 0.18 metres, almost five times given by AR5. Suggest highlighting this significant increase. [SAI MING LEE, China]	These values have been adjusted since the SOD and are closer to AR5 values.
10213	4	2	25	2	32	Need to include the updated projections for RCP6.0 to inform adaptation actions. [SAI MING LEE, China]	We have chosen not to emphasize RCP6.0 since little of the relevant literature we assess uses that scenario.
12075	4	2	25	2	32	1) In ES.3), "Different modelling studies demonstrate that under high emissions scenarios, Antarctica will likely contribute several tens of centimetres of sea level rise by the end of the century (medium confidence).", a conclusion in the Headline Statement that is not fully supported with what is specifically assessed in this chapter. 2) Please check the accuracy of the expression in line 31 that SLR is estimated to reach 19 mm/yr in 2100. [Government of China, China]	See 4.2.3.1 for a revised assessment. Headlines are aligned with that section. 19mm/yr updated and uncertainty range given.
13889	4	2	25	2	32	It would be useful to compare the scenario dependence/response of sea level to that of surface temperature. The scenario dependence over the 21st century is much less for sea level, but there are long-term implications. What does this mean for the Paris Agreement temperature goal? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	these relationships are covered in sections 4.1, figure 4.2 and in detail in section 4.2.
15047	4	2	25	2	32	We find it very helpful that an estimate is provided for the year 2100. However as it is unusual to provide point estimates for climatological variables, it would be helpful to include either a range, or some clarification on how this estimate has been derived. Also, please consider to include estimate pertaining to RCP1.9, as presented in the IPCC SR1.5, in order to provide information relevant to the Paris Agreement Art.2.1a [Government of Germany, Germany]	Same response to comment 18889
16491	4	2	25	2	32	in this point - and in contrast with the next bullet point (4) -, the (not core-insider) reader would expect an information about the processes that cause this expected contributions to SLR. [Georg Kaser, Austria]	Comment accepted. Paragraph deleted, some material removed and rewritten.
17239	4	2	25	2	32	There is ambiguity in the way that point 3 in the executive summary is phrased. The bolded section suggests that this is going to be a discussion of how much sea-level rise Antarctica will contribute by the end of the century. However, the remainder of the discussion seems to be about overall global mean SLR values by the end of the century (not just the Antarctic contribution). This should be addressed in order to avoid confusion in the final product. [Andra Garner, United States of America]	Same response to 16491

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19629	4	2	25	2	32	The model evaluation part is missing in the summary. I think it's better to have one or two sentence to discribe model evaluation and model uncertainties in SLR simulations. [APECS Group Review, Germany]	Same repsonse to 16491
22503	4	2	25	2	32	Suggest clarifying this paragraph with the characterisation of it in footnote 2.The text provides likely SLR range where likely is reprereresentative of the central 17- 83% range of possibilities, however the footnote states 66-100%. [Government of Australia, Australia]	Explanation of use of 17-83% range added to footnote.
22505	4	2	25	2	32	Suggest this section include the full probabilistic definition of the SLR range, and more guidance for the reader on the shape of the SLR distribution and the potential extent of the tails (or more extreme possibilities). Especially since 1.9.3 clearly articulates the need to communicate the full potential range of SLR (not just the likely range) to facilitate risk management and modelling of coastal impacts (Eg Kinsela et al., 2017 https://www.mdpi.com/2077-1312/5/4/61) requires [Government of Australia, Australia]	See response to comment 22503. Insufficient room here to provide full discussion of distributions. See section 4.2.3.3 for more information.
22723	4	2	25	2	32	Current wording makes it unclear whether the numbers given are specific to Antartica contribution only or the total SLR. The wording for the same paragraph in the SPM makes it more clear [Greeenpeace Group Review, Republic of Korea]	Same response as 16491
24445	4	2	25	2	32	Paragraph 3 bring lot of numerical information, but as presented these number is almost incomprehensible, and obscure the message wanted. [veijo pohjola, Sweden]	Same response as 16491
28389	4	2	25	2	32	This comment refers to other sections of the chapter as well and I realise it may be contentious and/or challenging to address. It is well established via multiple studies that the pdf of the SLR contribution from the ice sheets is non Gaussian with a large upper tail. The use of the likely range, as a consequence, provides a misleading indication of the risk and vulnerability. This was raised with an AR6 CLA for the relevant chapter and they said they were aware and may address the issue. I realise that this issue is discussed in Ch 1 CC Box 4 (not 3), but the Executive Summary needs to include something on this as this is the section most relevant to policy makers (PMs) who are unlikely to read most of the chapter. In additon, most/many PMs are more concerned about worst case or plausible values rather than the median or likely range. [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	Same response as 16491

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29713	4	2	25	2	32	Do these studies really consider the accelerating movement and deterioration of ice sheet streams? It seems to me that it is appropriate here to be indicating the limitations in the simulations. The Pollard-DeConto studies make clear, as I understand it, that one gets a much better simulation of the geological record of ice mass on Antarctic is one includes the marine instability, and yet I'd venture that the modeling studies being referred to on line 25 do not include this process--and its impact could be huge. I'd urge this finding thus be rather strongly qualified that there is a significant risk that the amounts and rates of rise could be much larger--there is a very big tail risk, and this is especially the case if the equilibrium sensitivity of sea level rise deduced from paleoclimatic studies is considered. The next finding does offer some indication of future prospects, but it is not clear to me what the basis is for thinking that we are okay until after 2100--how is it that Nature knows to keep the rate of rise small before 2100 and it could be very much higher afterwards---it seems to me that the commitment to significant rise is quite possibly already past and it is just taking a bit of time for the heat to penetrate downwards--sort of like being confident that the plank won't break because one ran out to the end quickly and there has not been time for the break to occur--not at all reassuring. [Michael MacCracken, United States of America]	Same response as 16491
30059	4	2	25	2	32	Since sea-level estimates presented here are based on two modelling studies, please specify “different” to “two”. [Ronja Reese, Germany]	Same response as 16491
19639	4	2	26	2	26	Why using the terminology "several tens of centimeters" when the text gives estimations in meters or millimeters in the following sentences? I suggest to use meters or millimeters in the first sentence. [APECS Group Review, Germany]	Same response as 16491
31311	4	2	27	0	32	How do these assessments match the one in SR1.5? Again the way it is presented, makes you think intuitively that the period beyond 2100 is less relevant or even that climate change ends in 2100. The combination of short and long term perspectives is needed to avoid such misreading even if intuitive. [Hans-Otto Poertner and WGII TSU, Germany]	Same response as 16491

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28579	4	2	27	0		In many places throughout this chapter (e.g. page 2, lines 27-31; Table 4.2; Figure 4.8; Table 4.5) values are given for projected magnitudes of sea-level rise for a particular time or epoch in the future, but the temporal baseline for this sea-level rise is not given. Need to state whether the projected rise is relative to the present-day, the start of the century, the year of a particular publication etc. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	We have tried to make baselines clear and uniform throughout
15655	4	2	27	2	28	What is the point of highlighting RCP2.6? What purpose does it serve? This RCP is fundamentally no longer applicable, and it begs the question as to why it is being highlighted in a summary conclusion. [EUCE, Belgium]	Same response as 16491
22501	4	2	27	2	28	Suggest clarifying why the upper range of projections under RCP2.6 are lower than in AR5. Higher projections under RCP8.5 are acknowledged, but not the slightly lower projections for RCP2.6. [Government of Australia, Australia]	Explanations of details not appropriate for ES.
21787	4	2	31	0		For the 19 mm/yr rate by 2100 for RCP8.5 (also in Table 4.3, p 41, line 20) - it is not clear if this is the rate for just the median SLR (one assumes it is?) [Robert Bell, New Zealand]	Accepted and rewritten elsewhere in ES.
2135	4	2	31	2	31	Why no uncertainty on 2100 rate? [Robert Kopp, United States of America]	Accepted. See response to comment 21787
15115	4	2	31	2	31	Could this statement be interpreted as, given RCP8.5, the sea level between 2100 and 2200 will rise with at least an additional 1.9 m (19 mm/yr)? Or is it possible that SLR rate could slow down during a relatively short time-period? [Sofie Schöld, Sweden]	Statement rewritten but we think it was clear.
16321	4	2	31	2	31	Potential RCP 8.5 GMSLR rates, in particular, must not be presented without uncertainty range. Please add! [Alexander Nauels, Germany]	Accepted
29075	4	2	31	2	31	Suggest adding, "These rates and upper ranges are expected to increase post-2100, especially under high emissions scenarios (confidence level)." [Pam Pearson, Sweden]	Point made elsewhere in ES. This statement rewritten.
2137	4	2	32	2	32	Although consistent with the caveat language in AR5 on larger Antrarctic contributions of a few tens of centimeters. [Robert Kopp, United States of America]	Noted but not adopted in ES.
23711	4	2	32	2	39	The Antarctic contribution is based on very few - only two - studies. One gets the impression that this may not be well enough recognised in the text/confidence level. [Government of Sweden, Sweden]	Assessment now based on broader set of models.
31313	4	2	33	0	39	The deep uncertainty should not exclude mentioning the orders of magnitude of change with a confidence statement. This can only add on top of the sea levels in the previous bullet point but this needs to be made clear. [Hans-Otto Poertner and WGII TSU, Germany]	Statement deleted and some material placed elsewhere with more elaboration on confidence in long term projection, elimination of MIC discussion.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15657	4	2	33	2	33	This summary conclusion, in the way which is written, suggests that ice-shelves will collapse, and that it is only a matter of time until they do. This is highly speculative and innacurate if you consider a number of ice-shelve in East Antarctica for example. The language used should be revised. [EUCE, Belgium]	See response to comment 31313
11539	4	2	33	2	34	Rewrite as "Processes controlling the ice-shelf and Marine Ice Cliff stability make Antarctica's contribution to future sea level rise deeply uncertain." Because it's not only unclear *when* ice shelves and ice cliff might collapse, but it's unclear *if* they will collapse. Need to be clear about that. [William Howard, Australia]	See response to comment 31313
22499	4	2	33	2	34	Suggest rewriting to reflect the full range of uncertainty. Suggest changing to "Processes controlling the ice-shelf and Marine Ice Cliff stability make Antarctica's contribution to future sea level rise deeply uncertain." as it is not only unclear *when* ice shelves and ice cliffs might collapse, but it is unclear *if* they will collapse. [Government of Australia, Australia]	See response to comment 31313
28581	4	2	33	2	34	Suggest also mentioning MISI (as well as MICI) in this statement, since the timing of both scenarios is highly uncertain [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	See response to comment 31313
30063	4	2	33	2	34	Please clarify. [Ronja Reese, Germany]	See response to comment 31313
15049	4	2	33	2	35	Sentence in bold is too convoluted. Please rephrase [Government of Germany, Germany]	See response to comment 31313
33425	4	2	33	2	35	The MICI process is still highly speculative, has only really been tested in a crude way in a single, low-resolution model, and is still the subject of very vigorous debate within the glaciological and modeling communities. Therefore, it is a mistake to mention it explicitly in the bold portion of this summary statement. It's explicit mention implies a level of agreement regarding its significance and that level of agreement does not exist yet. The statement in bold could be improved by simply removing the words "... and a possible marine ice cliff instability (MICI) ...". [Government of United States of America, United States of America]	See response to comment 31313
10821	4	2	33	2	39	Here I think it would be worth mentioning that the Antarctic contribution is based on only two studies, and that there is a great need for more ice-sheet models to be coupled to climate models perhaps as part of coming CMIP protocols [Magnus Hieronymus, Sweden]	See responses to comments 31313. A broader set of models now used for assessment in 4.2.3.1.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11081	4	2	33	2	39	This paragraph is widely incomplete and partial/biased. The paragraph correctly expresses the uncertainty that still affects the estimates of the stability or collapse of the ice sheets. But I found out pf place the mention of the Marine Ice Cliffs Instability (MICI) in the summary, being this only one of the many phenomena that need to be considered in the ice-modeling, and not necessarily even one of the most relevant. [Valentina R. Barletta, Denmark]	See response to comment 31313
15587	4	2	33	2	39	This paragraph is widely incomplete and partial. The paragraph correctly expresses the uncertainty that still affects the estimates of the stability or collapse of the ice sheets. However, the mention of the Marine Ice Cliffs Instability (MICI) in the summary is out of lace, being this only one of the many phenomena that need to be considered in the ice-modeling, and not necessarily even one of the most relevant. [EUCE, Belgium]	See response to comment 31313
16323	4	2	33	2	39	This ES section on ice sheet related uncertainties hides too much behind the deep uncertainty messaging. Despite substantial process understanding related uncertainties more information can be provided than what is currently presented. Please reassess and revise. [Alexander Nauels, Germany]	See response to comment 31313
19631	4	2	33	2	39	Just a remark: there are no available scenario beyond 2100-2300 and this hamper proper long-term projections. This is not written in this chapter and I don't know if it is written somewhere else in the report. I think it is good to mention somewhere because it will part of the improvements for the next IPCC AR7 (not AR6) and CMIP7 to be discussed about. [APECS Group Review, Germany]	Noted
19633	4	2	33	2	39	It may read clearer if it is emphasized that this sub-section is about post-21st century SLR. [APECS Group Review, Germany]	See response to comment 31313
24447	4	2	33	2	39	Paragraph 4 bring in a relatively new concept, that is yet untested, and likely with enough empirical evidence. The process is of outmost interest, since this mechanisms places the upper uncertatinties much higher than brought in by AR5. Some caution is probably neccessary when presenting this concept.Since the concept is new the acronym should be avoided. [veijo pohjola, Sweden]	See response to comment 31313
1573	4	2	33	3	39	Is this a candidate for a kind of "deeply uncertain but physically plausible scenario..." for high levels of SLR from Antarctica? I exepct people will be expeting something in the SROCC about this. Also, say something about abruptness, irreversibility? [Matthew Collins, United Kingdom (of Great Britain and Northern Ireland)]	See response to comment 31313

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26093	4	2	34	2	34	MICI should not be in the ES: first most readers won't know what that is and a more general term is better (e.g. "Processes controlling rapid ice sheet mass loss and possible ice-shelf collapse ...."). Second, the ES should contain statements that have higher levels of confidence. MICI as outlined in Chap. 3 is based on very limited evidence and assiged low confidence in Ch. 3. Elevating this idea to the ES is not justified given the current limited research on this topic. As it is, it also sounds like a future ice-shelf collapse is a fact, only the processes are unknown. [Regine Hock, United States of America]	See response to comment 31313
29079	4	2	34	2	34	Per comment immediately above, here is one example: "...deeply uncertain for the upper ranges of estimates, especially towards 2100 and beyond." [Pam Pearson, Sweden]	See response to comment 31313
16527	4	2	35	2	35	Check reference is to the right cross chapter box. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	Noted
28583	4	2	35	2	35	There are several places in this chapter where Antarctic processes are mentioned and the reader is referred to 'Cross-Chapter Box 2' or 'Cross-Shapter Box 3', when I think the correct reference is 'Cross-Chapter Box 6' [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	Noted
29081	4	2	39	2	39	"...confidence), although a few studies indicate a commitment to multi-meter SLR from the WAIS even at low emissions scenarios, though at far slower (multi-century) rates that allow greater adapation." (This refers to the studies by Joughin at all (2014) and others noted in 4.2.3.6.) [Pam Pearson, Sweden]	See response to comment 31313
16325	4+B206:H206	2	40	2	40	The Chapter 4 ES needs to cover post-2100 SLR in more detail. Enough post-AR5 research has been carried out that would allow to provide 2300 estimates with the underlying caveats, of course. Please revise! [Alexander Nauels, Germany]	Accepted. See discussions of long term and implied commitment in 4.1 and 4.2.3.5
2467	4	2	41	0	45	Although I agree with the sentiment, be careful with the wording. Storm surge events do not occur more frequently as a result of sea level rise, but coastal flooding events do. [John Church, Australia]	Accepted, surge deleted, passage edited.
4843	4	2	41	0	45	At this point it is probably a good idea to remind the reader if RCP8.5 corresponds to 'business as usual', or else what is the relevance of highlighting RCP8.5? It is also very important to elevate evidence on populations at risk to the ES, as these will be needed for the SPM. Any evidence on current trajectory, populations, costs, etc is important for policy makers. Actual numbers are helpful. [Debra Roberts and Durban Team, South Africa]	We are reluctant to highlight population exposure numbers in ES due to great uncertainty in elevation estimates.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31315	4	2	41	0		Please add numbers for those extreme sea levels. From a communication point of view this would actually nicely link the importance of specific sea levels with expected levels of flooding. [Hans-Otto Poertner and WGII TSU, Germany]	see response to comment 4843
3613	4	2	41	2	41	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted - to be addressed in final proofing
3615	4	2	41	2	41	extreme sea level events --> ESL events [Nam SungHyun, Republic of Korea]	Noted - to be addressed in final proofing
2299	4	2	41	2	43	42 those that, in the past, have been associated with surges from intense cyclones), will become common [Unnikrishnan Alakkat, India]	Reference to surge deleted.
2315	4	2	41	2	43	43 by 2100 under all RCPs, leading to severe flooding in the absence of strong adaptation [Unnikrishnan Alakkat, India]	Rewritten, point captured elsewhere in ES.
2317	4	2	41	2	43	Please do not use 'common', instead, 'more frequent' may be used [Unnikrishnan Alakkat, India]	Noted and rejected because common is more to our point than "more frequent"
2319	4	2	41	2	43	In RCP8.5, many small islands and megacities will experience such events annually by 2050 [Unnikrishnan Alakkat, India]	we are not sure what the comment asks us to do
2321	4	2	41	2	43	45 {4.2.3.4}. [Unnikrishnan Alakkat, India]	see response to comment 2319
2323	4	2	41	2	43	is apossibility [Unnikrishnan Alakkat, India]	see response to comment 2319
19645	4	2	41	2	43	The statement needs to be extended by the respective locations to be in agreement with the summary on page 4-51 lines 14-21. There it is clearly stated that "for some locations, even RCP2.6 will lead to the annual occurence of historically rare events" (Line 20-21). Therefore I suggest to rewrite: "Due to projected global mean sea level rise, extreme sea level events that are historically rare (e.g., those that, in the past, have been associated with surges from intense cyclones), will become common at many locations by 2100 under RCP8.5 (high confidence), and at some locations even for RCP2.6, leading to severe flooding in the absence of strong adaptation." [APECS Group Review, Germany]	Noted and incorporated into rewrite, with material moved elsewhere in ES.
31297	4	2	41	2	43	Is there a way to differentiate extreme sea level events more clearly from global mean sea level rise in this section of the Executive Summary? Could for exemple the sub-headline in line 3 be changed to "Changes in global mean sea level and extreme sea level events"? Could causes of extreme sea level events be described in a little more detail and outside brackets in this paragraph? This would ensure that extreme sea level events are not overlooked, especially by fast or superficial readers. [Hans-Otto Poertner and WGII TSU, Germany]	We hope the revised language and reorganization of the ES makes this point more clearly but it is difficult to make the ESL/GMSL relationship transparent yet sufficiently compact for an ES.
15117	4	2	41	2	45	The mechnism behind this needs to be briefly adressed, i.e. why will ESL events become more common? [Sofie Schöld, Sweden]	see response to 31297
16493	4	2	41	2	45	bold and normal text are unbalanced [Georg Kaser, Austria]	Noted and rewritten but we do not agree that a uniform standard exists for this.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15659	4	2	43	2	43	The use of the term "strong" in relation to adaptation can be seen to be misleading. Suggest using "effective" instead. [EUCE, Belgium]	Taken into account and revised in ES.
31179	4	2	43	2	43	Unclear terminology “strong adaptation” [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account and revised in ES.
1577	4	2	44	2	44	Statement about small islands and megacities is a bit vague without using e.g. return periods. [Matthew Collins, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account and revised in ES.
2139	4	2	44	2	44	The basis for restrictimng this statement to RCP 8.5 is not clear from the supporting analysis in chapter 4. Fig 4.10 shows this is also true in RCP 2.6. [Robert Kopp, United States of America]	Accepted and rewritten.
5037	4	2	44	2	44	Is it possible to estimate the number of people that will be exposed to these extremes? [Debra Roberts and Durban Team, South Africa]	Taken into account in several sections in 4.3, including 4.3.2.2 and 4.3.3.2,
9589	4	2	44	2	44	We suggest to add "coastal" before "magacities". [Government of France, France]	Taken into account in finalisation of ES statements.
15589	4	2	44	2	44	Assume that the megacities experiencing severe events annually are those located in coastal areas? Please accurately reflect that coastal areas, including megacities in coastal areas, will experience such events more frequently [EUCE, Belgium]	Taken into account in finalisation of ES.
2309	4	2	44	2	45	There is a need for improved editing. Flooding Events will increase in small islands .. (not meteorological events) [Unnikrishnan Alakkat, India]	Noted - and addressed in finalisation of ES and chapter.
4111	4	2	44	2	45	The sentence “In RCP8.5……”is not enough to support the above conclusion in bold. What will happen in 2100? What about the low-lying coasts, River Deltas? [Jiahong Wen, China]	Taken into account in finalisation of ES.
15051	4	2	44	2	45	Para 2 of this ES (ln 23-24) indicates that differences in SLR until 2050 are small between the RCPs. Here you state that extreme sea level events will be experienced annually under RCP8.5. While not strictly a contradiction, those two statements should be better aligned - clarifying whether or not there is a significant difference in ESL events by 2050 between the scenarios discussed here and in para 2. [Government of Germany, Germany]	Taken into account in finalisation of ES statements.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29083	4	2	45	2	45	With regards to "deep uncertainty" (per Comment 58, above) it might be useful at this point in the ES to note that (possible language): "The current rate of temperature change is likely greater than at any time in human experience (assume that is high confidence), and potentially greater than at any time in Earth's geologic history (assume that is low confidence). As a result, projecting especially the rate of change in the great ice sheets is extremely difficult, because it is likely that these have never experienced such rapid rates of temperature rise as are occuring in this century. Models can help predict just how fast the ice sheets can lose mass, but some dynamics may only become apparent as these occur (per section 4.2.3.1). Low emissions scenarios, as outlined in SR1.5 may help constrain these unknown risks by slowing current rates of temperature rise by the end of this century." [Pam Pearson, Sweden]	Line reference incorrect.
15251	4	3	0	0		Please provide information on the costing of such adaptation measures in particular for low lying LDC countries. [Government of Gambia, Gambia]	Noted, and where available adaptation cost information is available it is addressed in 4.4.2

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29109	4	3	1	2	5	This ES absolutely needs to include bullet points on all of the elements outlined in Table 6.1. Especially as someone primarily working with negotiators and policy makers, I found myself enormously confused first, by the limited nature of relevant topics included in the Contents that would otherwise be encompassed by the "Extremes and Abrupt Changes" rubric; and subsequently, the similar lack of coverage in the chapter ES. These multiple additional and highly relevant topics then first appeared only in Table 6.1, which does provide an extremely useful summary of current knowledge. However, especially to be useful for policy makers (who universally tend to read only the SPM and ES sections of IPCC products, so may never even read as far as Table 6.1 otherwise), the ES also should serve as a more comprehensive summary of all of the most important "abrubt and extreme" events, not just those introduced in this chapter. This is especially the case because these events are not necessarily raised in the respective Executive Summaries where the underlying science appears. To avoid this substantive miss (and confusion as to the exact point of this chapter), strongly suggest that a) the Ch. 6 ES cover main messages of ALL major Extremes and Abrubt Changes, including those more completely covered in other chapters; and b) that the ES introduction (page 3, 3-5) and main text introduction (6, 3-7) clearly note that a number of extremes/abrupt changes are covered in other chapters, so noted here but the underlying science is covered in those other chapters; similar to the note that only first appears above Table 6-1 (page 7, 47-48) -- and which I frankly missed at first read. If this revision is too difficult for the drafting group given the press of time, then alternatively suggest that Table 6-1, with its references to other chapters, be moved into the ES section and so noted in the ES introduction (page 3, 3-5). [Pam Pearson, Sweden]	Noted - comment applies to Ch 6.
2987	4	3	1	3	1	Subsidence OR UPLIFT (e.g. in Scandinavia) are important contributors to relative sea level changes [Goneri Le Cozannet, France]	We have narrowed our focus to anthropogenic subsidence.
10301	4	3	1	3	1	"Subsidence" is an important contributor to future changes in relative sea level subsidence of What? Land? Coastal area?? Be specific?? [Mahmood Riyaz, Maldives]	Bullet moved and rewritten to provide more detail on this point.
13901	4	3	1	3	1	The term 'subsidence' could usefully be defined before using. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Subsidence is defined in the glossary and this cannot be done adequate justice in an ES. We have narrowed our perspective to anthropogenic subsidence
1575	4	3	1	3	7	Potentially confusing acronyms used here; GMSL, SLR, RSL, ESL [Matthew Collins, United Kingdom (of Great Britain and Northern Ireland)]	Noted - acronyms are used more sparingly and consistently in the final document.
1671	4	3	1	3	7	Which human activities lead to local subsidence? [Nora Richter, United States of America]	Taken into account and explained in sections addressing subsidence, e.g., 4.2.2.5.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13897	4	3	1	3	7	The authors introduce "relative sea level" without defining what this is. Do you need to get into definitions here? Perhaps you could simply refer to "local sea level" and talk about the effect of subsidence on vertical land motion and hence sea level? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account and explained in the Introductory section 4.1.2
15119	4	3	1	3	7	Should perhaps also mention post-glacial rebound as an important mechanism for RSL change on a local scale. [Sofie Schöld, Sweden]	See response to 2987
19667	4	3	1	3	7	Executive Summary 6) is about subsidence. Without a describing word (as e.g. subsidence of "land") it is not necessary clear what is meant by subsidence. The term "Subsidence" occures on page 4-8 line 13, page 4-27 line 18, page 4-28 line 40 without explanation until it is explained on page 4-28 line 51-52. [APECS Group Review, Germany]	we refer to the glossary for a specification
22037	4	3	1	3	7	Subsidence is not limited to delta regions. Pfeffer and Allemand, 2016 (Fig. 7 p45) provided evidence of more than 182 coastal sites strongly affected by coastal subsidence that increased the effects of climate-induced sea level rise. Reference: Pfeffer J. and P. Allemand, 2016, The key role of vertical land motions in coastal sea level variations: a global synthesis of multisatellite altimetry, tide gauge data and GPS measurements, Earth Planet. Sc. Lett., 439, 39-47, doi:10.1016/j.epsl.2016.01.027. [Julia Pfeffer, Australia]	we rephrased
29715	4	3	1	3	7	I would think it helpful to explain here, briefly, what relative sea level is, given that it is these findings that receive wider attention and are distributed without the glossary of terms. The ninth finding actually does this, but does not mention that this is what is meant by relative sea level rise. [Michael MacCracken, United States of America]	We have reorganized the ES in a way that we believe makes the definition of RSL clearer.
31317	4	3	2	0	3	Can the range of contributions of subsidence to sea level rise be quantified? [Hans-Otto Poertner and WGII TSU, Germany]	Noted but uncertainties in subsidence rates are vaery high and the rates are very variable so we prefer to stick with general statements.
19651	4	3	3	3	3	"In some regions", please precise if these regions only refer to delta regions or other type of coastal regions in the world. [APECS Group Review, Germany]	rephrased

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19647	4	3	9	3	33	Are the temperature targets in the Paris agreement sufficient enough to avoid or reduce the risk of sea-level rise? And is 1.5ºC target much better than 2ºC target accorrding to the perspective of avoiding or reducing risk of future SLR? IPCC report is highly policy relevant, therefore I think the answers to the two questions are important for policy decision makers. It will be very disappointing if we do not see any discussion on the above important questions in this IPCC special report. I suggest to link with the 1.5 degree warming report. [APECS Group Review, Germany]	we added this line of sight
31319	4	3	11	0		Not only current settlement trends but historical settlements as well! Suggest inserting “historical and current” before settlements. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised statements in the ES.
23189	4	3	11	3	11	Trend in exposure important, should be reported in SPM (beginning?). [Valerie Masson-Delmotte, France]	Taken into account in revised statements in the ES.
16495	4	3	11	3	20	text too extended for executive summary [Georg Kaser, Austria]	Taken into account in revised statements in the ES.
31321	4	3	13	0	17	That there is better understanding is not a relevant message for the executive summary, but this understanding should best be reflected and converted into a quantified finding of the assessment combined with a confidence statement. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised statements in the ES.
6111	4	3	14	0		Insert "a" before "systematic" [Nina Hunter, South Africa]	Taken into account in proofing of final draft of chapter.
31323	4	3	17	0	18	Can a typical pathway be proposed how to reduce risk, in line with the cross-chapter box on risk and adaptation? [Hans-Otto Poertner and WGII TSU, Germany]	Noted - such a proposal does not fit in the ES; and pathways are highly context dependent. Key enablers and lessons learned, including pathways thinking, are identified in the FGD.
15591	4	3	17	3	20	Integrated planning can also reduce risks in the longer term (not only short and medium term) - as rightly pointed out at the beginning of the paragraph, demographic and built environment trends have already increased exposure and vulnerability, and these are two key drivers that have to be addressed. [EUCE, Belgium]	Taken into account - both in ES and section on planning for SLR (4.4.4)
15053	4	3	19	0		Please provide a confidence level for this very relevant statement. [Government of Germany, Germany]	Taken into account in revised statements in the ES.
19653	4	3	22	3	23	Text in parenthesis is not necessary. [APECS Group Review, Germany]	Rejected: We were advised to be explicit about the geographies being referred to).
32617	4	3	22	3	30	wondering why the coral reef degradation's contribution to sea level vulnerability/hazard is not included as an assessment point, even if confidence may be low. it seems a key area of compound risk for low-lying islands that are losing reef structure from climate change over next decades. From my reading of 4.3.3.3, I understand that reef degradatation has not yet contributed to an erosion signal across low-lying coral atolls - perhaps worth saying so in the executive summary. [Kim Cobb, United States of America]	Noted: We explicitly reference limits to ecosystem based adaptation of corals in the ES; with more extensive treatment in 4.3.3.5.2

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31325	4	3	23	0		Can the risk be specified and quantified more than just saying “are at risk”? [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised statements in the ES - with particular attention paid to providing empirical and other evidence in support of statements.
3617	4	3	23	3	24	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted
27853	4	3	25	0		Its not clear what is meant by highly populated but less intensively developed regions. Does this mean areas without protective infrastructure? In developing countries? Clarity would help this important point, particularly in light of the points made in pg 3 lines 48-52 [Ko Barrett, United States of America]	Taken into account - highly populated replaced by densely populated and wording in ES and body of chapter reframed to be more explicit about intended meaning.
19655	4	3	25	3	25	Replace "Highly populated" by "Densely populated" if correct. [APECS Group Review, Germany]	Accepted
19657	4	3	25	3	25	"less intensively developed regions": the terminology is vague. Do you mean economically less industrialized? Or more rural regions, with less population? Please clarify. [APECS Group Review, Germany]	Accepted - reworded in revised ES and relevant chapter sections.
12077	4	3	25	3	26	Please confirm whether the ‘rural coasts’ are among the ‘highly populated’ areas. [Government of China, China]	Taken into account in rewording ES and relevant chapter sections.
6113	4	3	27	0		Remove "a" [Nina Hunter, South Africa]	Accepted
27051	4	3	28	0		In addition to protect, accommodate and retreat, recent reports and publications are also discussing advance and avoid as important adaptation strategies to manage SLR. [Kees Lokman, Canada]	Noted - we have included advance in the list of SLR response options, and explicitly explained how avoidance strategies do away with need for intervention.
19659	4	3	28	3	28	"accommodation, and retreat": please use more precise terminology: retreat of what? [APECS Group Review, Germany]	Taken into account: Retreat is explained in detail in Box 4.3
31327	4	3	30	0	31	Can limits to adaptation be identified in similar ways as in the AR5 SYR, may be differentiated by regions and coastlines? [Hans-Otto Poertner and WGII TSU, Germany]	Noted: For the purposes of our assessment we found it most helpful to assess adaptation limits in terms of SLR response options and their relative effectiveness (4.4.2)
19669	4	3	31	3	31	The reference to section 4.3.3.4 Salinization is not discussed in the Executive Summary 8). Is this reference set correctly? [APECS Group Review, Germany]	Noted and addressed in revised ES
31181	4	3	33	0		Impacts need to be expanded, in particular, specific (!) findings on the impacts on a) livelihoods and b) ecosystems and their services. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES
23937	4	3	35	3	38	Examples of increasing evidence of changes at the coast seem not to be comprehensive (e.g. cultural and aesthetic values could be included in ecosystem services). We suggest examples to be aligned with the title of subsections from 4.3.3.2 to 4.3.3.6 (submergence and flooding of coastal areas, coastal erosion, salinization, ecosystems and ecosystem services, and human activities). [Government of Japan, Japan]	Noted and taken into account in revision of ES statements.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31299	4	3	35	3	38	This paragraph might determine how the following ones about response options are perceived. Would it be correct to rephrase the first two sentences to "There is increasing evidence of changes at the coast with respect to ecosystems, ecosystem services, coastal infrastructure, habitability, community livelihoods, and cultural and aesthetic values. These changes are amplified by non-climatic drivers and local processes unrelated to sea level rise and cannot always be attributed clearly to sea level rise (medium confidence)." I might also suggest to integrate this paragraph into one of the previous sections instead of singling it out with an individual headline. [Hans-Otto Poertner and WGII TSU, Germany]	Noted and taken into account in revised ES statements - which explain more precisely that non-anthropogenic drivers shape exposure and vulnerability to SLR; and the distinct and important point about impacts on coastal ecosystems due to non-CC factors and SLR, but the associated attribution difficulty.
16327	4	3	35	3	41	This ES section on impacts is not comprehensive and too short, in particular when comparing with the very long section on responses. The chapter provides an excellent quantitative assessment of SLR impact and risks under 4.3.3, including some regional information. This very relevant content has to be reflected in the ES appropriately, including the six coastal hazard categories. Please elevate more of this content and better balance the ES. [Alexander Nauels, Germany]	Taken into account in revised ES structure and statements.
19649	4	3	35	3	41	Given the significance of impacts of SLR, and the level of detail included in section 4.3, it may be prudent to break this summary item (#9 - Impacts of Sea Level Rise) into two parts - one on the observed impacts (types of impacts, how they are differentiated by pre-existing vulnerability, etc.), and one on the difficulty of attributing those impacts to SLR. This would provide more space to highlight the major knowledge of impacts, and reasons for limitation of knowledge. [APECS Group Review, Germany]	Taken into account in revised ES structure and statements.
22039	4	3	35	3	41	the point 9 is unclear. What is the message do you want to get through? [Julia Pfeffer, Australia]	Noted and addressed in revised ES
22725	4	3	35	3	41	Impacts of Sea Level Rise condensed down to 1 paragraph misses significant details including economic and social costs that would benefit from more concrete summary in the executive summary [Greeenpeace Group Review, Republic of Korea]	Taken into account in revised ES structure and statements.
33429	4	3	35	3	41	Add effects on species in addition to ecosystems. Species tied to intertidal and supratidal areas likely will loose habitat in addition to built habitat lost through development. Examples of species include salt marsh harvest mouse, rails, nest seabirds, and breeding pinnipeds. [Government of United States of America, United States of America]	Noted - we have used the tradition definition of ecosystem to include interacting species / organisms and their physical environment.
19661	4	3	37	3	37	Replace "sea level rise" by SLR. [APECS Group Review, Germany]	Noted
3619	4	3	38	3	38	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19663	4	3	38	3	38	Replace "sea level rise" by SLR. [APECS Group Review, Germany]	Noted
23939	4	3	38	3	41	We suggest the last sentence, "This underscores ... local drivers of exposure and vulnerability", be omitted because it provides the same information as the last sentence of paragraph 7 (page 2. line 17-20). [Government of Japan, Japan]	Noted - the revised ES statement necessarily concludes with a statement about SLR response implications.
6115	4	3	39	0		Full stop missing at end of sentence. [Nina Hunter, South Africa]	Noted
13903	4	3	40	3	41	This sentence highlights the 'merit of short to medium term risk' but it is not clear what these timescales refer to. In addition does this present a risk of 'locking in' unsuitable solutions over the longer term? Please clarify. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted - revised ES statements have been written to more clearly convey intended meaning. Timeframes are explained where necessary in relevant sections, including those referenced here wrt this ES statement.
25569	4	3	43	0		The issue of maladaptation is insufficiently dealt with here. If SLR is rising over centuries, adequate responses need to reflect on long-term risks and not just the next decades. Information on limits to adaptation in the light of avoided impacts as a result of stringent mitigation is essential. I.e. building up causal chains beyond 2100. [Schleussner Carl-Friedrich, Germany]	Taken into account: Limits to adaptation wrt the effectiveness of SLR response options is explained in 4.4.2
31329	4	3	45	0	46	This reads abstract and theoretical. Integrating this with an illustrative example would be useful to be fully comprehensible. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statement.
32317	4	3	45	3	46	More clearly stated as a variety of measures to protect, accommodate, etc . [Donald Boesch, United States of America]	Taken into account in revised ES statement.
27053	4	3	45	3	47	Consider including “avoid” as one of the key adaptation strategies. [Kees Lokman, Canada]	Rejected - as important as this strategy is, we aim to provide empirical evidence of responses which is to some extent feasible on protect, accommodate, advance and retreat; not avoid. However, we explicitly highlight the importance of this strategy in sections on SLR responses (4.4).
15593	4	3	45	3	57	Integrated planning and enabling environment, incentives and disincentives schemes play a key role, and will have to become increasingly aligned with expected climate change. This paragraph (and the underlying sections of the chapter) should therefore give due consideration to this aspect when discussing responses to slr, beyond protection and retreat. Integrated planning can also help reduce divergence. [EUCE, Belgium]	Accepted, including revised ES statement on this point.
16497	4	3	45	5	19	too many and too detailed bulet points. 10 - 18 should be condensed and combined. [Georg Kaser, Austria]	Taken into account in revised ES structure and statements.
3621	4	3	46	3	46	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13899	4	3	46	3	47	The phrasing of this sentence is a little unclear. Are these consequences synergistic/antagonistic with SDGs (which the underlying point seems to imply with the reference to inequalities in protection)? Could you specify what they are synergistic with e.g. "consequences that are synergistic, complementary or antagonistic with communities affected/development goals/something else.." [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised ES statement.
29717	4	3	48	3	48	Saying "can be feasible and affordable" needs to be qualified by saying for how long this might be the case--or how much rise, and how this will depend on potential wave action and storm surges. Also, it is not possible in some areas like Miami that are underlain by, for example, limestone geology that develops significant holes and passages. [Michael MacCracken, United States of America]	Taken into account in revised ES statement.
15055	4	3	49	0		is "likely" here really indicating likelihood in the sense of the IPCC calibrated uncertainty language? If so, please consider to reformulate into a factual statement with confidence in brackets. If not, please replace the word "likely" with a different expression indicating that the authors consider that a probable outcome. [Government of Germany, Germany]	Taken into account in revised ES statement.
25419	4	3	49	3	52	Explain "To protect critical infrastructure" ... for a certain level of hazard that can't totaly be anticipated, forecasted. Every protection-solution can fail. In France after Xynthia storm, most of casualties were behind dykes. [Boris LECLERC, France]	Taken into account in revised ES statement.
13905	4	3	49	3	53	This sentence highlights the potential for a diverging world and refers to 'densely populated areas well protected being dikes', clearly other protection methods could be used and so this should be a broader statement of protection. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised ES statement.
16329	4	3	50	3	50	As you have already rightly pointed out, dikes are not the only coastal protection measure, which this statement somehow suggests. Please delete 'behind dikes'. [Alexander Nauels, Germany]	Taken into account in revised ES statement.
12693	4	3	50	3	51	This statement may not be totally valid! I suggest it be revised. Richer and sparsely populated areas may as well be well-protected behind dikes if the areas are of economic important. Likewise poorer and densely populated areas may struggle with SLR impacts. [Olusegun A. Dada, Nigeria]	Noted and revised according to empirical evidence assessed.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21791	4	3	52	0		Residual risk will mostly *increase* with coastal protection measures - given same development behind protection but higher baseline sea level, then by definition, the residual risk rises e.g. any breaches, overtopping by events (excluding any additional future development behind the protection due to perceived safety) [Robert Bell, New Zealand]	Taken into account in revised ES statements.
16331	4	3	52	3	52	It is strange to see specific citations being included in the ES. Please remove Hinkel et al 2018. Also, why are the ES paragraphs numbered? [Alexander Nauels, Germany]	Accepted
17241	4	3	52	3	52	Were in-line citations intended to be included in the Executive Summary? If so, they are severely lacking throughout the rest of the Executive Summary. If not, remove (Hinkel et al. 2018) from this location. [Andra Garner, United States of America]	Accepted
19665	4	3	52	3	52	Remove the reference. [APECS Group Review, Germany]	Accepted
21793	4	3	55	3	56	Retreat - residual risk may not be eliminated entirely - depends on retreat distance or land elevation (and what measure is in place at the shoreline) plus timeframe considered (up to centuries) - could use "minimizes" instead [Robert Bell, New Zealand]	Taken into account in revised ES statement.
13907	4	3	55	3	57	Text note 'Retreat is the only measure that eliminates residual SLR risk locally'. This is presumably dependent on the level of retreat and local communities having the necessary advice on flood risk to retreat to a suitable risk free location? The text could usefully be clarified to reflect this. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised ES statement.
26171	4	4	1	4	9	Are all references really needed. This paragraph is hard to read. Same problem throughout the chapter - a careful choice of references will make this chapter better rather than endless lists. [Regine Hock, United States of America]	Accepted
9907	4	4	1	174	1	In general terms, there is a dominant top-down approach with technological-scientific fix, where the bottom-up approach, especially from the LDC is mostly absent. These countries do not have the financial and technological resources to prevent most of their disasters as a lack of prevention and the exposition to extreme event. Confronted with this dilemma, most countries are alone with their lack of resources and most integrate their population to deal with the growing threats of SLR, cyclones etc. There is also missing an analysis on peaceful negotiations to overcome or mitigate different conflictive processes related to SLR, disasters, loss of life and livelihood, etc. [Úrsula Oswald Spring, Mexico]	Taken into account in revised ES statements and sections on SLR responses (4.4).

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29719	4	4	2	4	2	What "advance" means is not at all obvious, and certainly won't be in some extraction of this finding. Would not the word "retreat" be more appropriate? [Michael MacCracken, United States of America]	Accepted
13915	4	4	2	4	4	Is the confidence level here referring to the ability of protect, accommodate and advance measures buying time for communities? Or does the confidence level refer to the uncertainties in the science being updated over time to help decision makers? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised ES structure and statements.
13913	4	4	2	4	6	Suggest that this point is elevated to the SPM. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted and taken into account in SPM drafting
10295	4	4	2	4	8	A recently published paper on cost-benefit assessments of coastal protection at global scale supports that the incremental adaptation cost was less than the economic damage (Tamura et al., 2019, Climatic Change, https://doi.org/10.1007/s10584-018-2356-2). [Yukiko Hirabayashi, Japan]	Thank you - this paper is cited at least 4 times in the FGD.
13909	4	4	2	4	9	The non-bold text should support the statement in the bold text "with more clarity about the trajectory of … sea level rise". Explain the reader how there is more clarity and what is meant by 'buy-time'. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised ES statement.
15121	4	4	2	4	9	I am missing a solution to the problems presented, i.e "Therefore, it is of utter importance to carefully consider all possible outcomes before interventions are implemented, in a decision process where x, y and z are taken into account…" [Sofie Schöld, Sweden]	Taken into account in relevant sections on SLR responses; and revised ES statements.
31331	4	4	4	0		Again, providing illustrative examples for accommodate and advance adaptation measures would be very beneficial as well as an estimate of limits to adaptation and residual risk in such example. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statements.
3623	4	4	4	4	4	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted
21795	4	4	5	4	6	Should add to the list of resulting effects of "increased residual risk" - that ties it back to Finding #10 [Robert Bell, New Zealand]	Taken into account in revised ES statements.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17419	4	4	11	4	54	There is a missed opportunity to connect point 12 on this page (lines 11-20 - about the gaining traction of ecosystem based approaches to coastal management) with point 15. Specifically, when you say: 'Community-based approaches, which involve local people directly in understanding and addressing the climate change risks they face, are increasingly used by people living in low-lying coastal areas to adapt to climate change impacts, including SLR, especially in developing countries (medium evidence, high agreement). Particular attention is focused on reducing local-level vulnerability and building resilience…' you could note that ecosystem based approaches (as on lines 11-20) may be pursued for multiple reasons including climate mitigation and carbon financing revenues, and in so doing also deliver resilience. I think the dual mitigation and adaptation/resilience benefits of coastal, ecosystem-based climate interventions are missing here: such as – for example - conserving and restoring mangroves, ref. Huxham et al (2015) Applying Climate Compatible Development and economic valuation to coastal management: A case study of Kenya's mangrove forests https://www.sciencedirect.com/science/article/pii/S0301479715300219?via%3Dihub and Emerton et al (2016) Valuing Ecosystems as an Economic Part of Climate-Compatible Development Infrastructure in Coastal Zones of Kenya & Sri Lanka https://link.springer.com/chapter/10.1007%2F978-3-319-43633-3_2 [Mairi Dupar, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised ES statements, including explicit reference to co-benefits associated with ecosystem based responses.
13911	4	4	11	5	19	The statements in parenthesis, e.g. "medium evidence, high agreement" seem overly verbose and detract from the clarity of the message. Suggest these are boiled down to an overall confidence statement or removed. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted: All ES statements are carefully written to reflect the findings of the assessment in terms of evidence and agreement; and where possible summary confidence statements are provided.
15661	4	4	12	4	12	Suggest replacing "are gaining" to "continue to gain" traction […] [EUCE, Belgium]	Taken into account in revised ES statement.
21797	4	4	13	4	14	Dune vegetation and dune enhancement (nourishment or rehabilitation) not mentioned as a frequently used hybrid approach [Robert Bell, New Zealand]	Taken into account in revised ES statement and addressed in multiple sections on SLR impacts and responses.
31333	4	4	14	0		Can limits to adaptation be added or indicated, on top of risk reduction benefits? [Hans-Otto Poertner and WGII TSU, Germany]	Noted and explicitly addressed in revised ES statements and covered in section on effectiveness of SLR response options (4.4.2).

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13917	4	4	15	4	17	There is medium evidence that ecosystem-based measures bring 'substantial' economic benefits but low agreement on the scale of benefits. So what is the basis for the view of 'substantial' economic benefits? Just local? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted and taken into account in revisions to ES - however note that the revisions reflect available empirical evidence.
31335	4	4	17	0	19	This reads again very theoretical. It would be better to argue from a limited set of ecosystem-based measures and then address some aspects that may be unifying as indicated in the bullet point, and to try to be as quantitative as possible. [Hans-Otto Poertner and WGII TSU, Germany]	Noted and taken into account in revisions to relevant ES statements.
15581	4	4	17	4	18	Delete the sentence : There is medium evidence and low agreement regarding the design considerations for ecosystem-based measures. Rationale: CBD COP14 adopted Voluntary Guidelines on the Design and Implementation of Ecosystem-based Approaches to climate change adaptation and disaster risk reduction. The work is based on evidence and examples from many different sectors see inter alia CBD Technical Series Report 85 'Synthesis Report on Experiences wiht Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction https://www.cbd.int/doc/publications/cbd-ts-85-en.pdf and Information Document CBD/SBSTTA/22/INF/1 https://www.cbd.int/doc/c/3f7a/4589/5cc1b7058bf52427fa9bae84/sbstta-22-inf-01-en.pdf [EUCE, Belgium]	Taken into account in revised ES statements to reflect available empirical evidence about costs and long-term effectiveness.
25421	4	4	18	4	18	Nature-based solutions are a good way to anticipate for mid and long-term hazards (coastal erosion, coastal flooding) even for urbanized areas (for example 10 million of sand nourishment in 2017-18 to protect the City of Dunkerque in northern France). [Boris LECLERC, France]	Noted - taken into account in reviwsed ES statement to reflect available empirical evidence.
13919	4	4	18	4	20	The text notes that 'there is medium evidence and low agreement regarding design considerations for ecosystem-based measures', what do these 'design considerations' refer to? This should either be briefly expanded here or removed. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted and taken into account in revised ES statement.
27055	4	4	19	0		Explain design considerations: does this include engineering measures, adaptive planning frameworks, and implementation strategies? [Kees Lokman, Canada]	Noted and taken into account in revised ES statement.
19671	4	4	20	4	20	The reference to section 4.4.4.5 is wrong. This section does not exist. [APECS Group Review, Germany]	Accepted
27057	4	4	22	4	29	Comment on the fact that SLR does not have any boundaries: mention the challenges of cross-jurisdictional coordination needed to successfully analyze, plan, design, fund and implement adaptation strategies. [Kees Lokman, Canada]	Taken into account in revised ES statements.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3625	4	4	23	4	23	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted
21799	4	4	24	0		"coastal habitability" is ambiguous - could be suitability of terrain for development through to human attachment to place. Indigenous cultural aspects and associated land ownership/stewardship models also play a role in adaptation choices [Robert Bell, New Zealand]	Accepted; revised in FGD ES
31337	4	4	25	0	26	This is unclear about the direction of social choices which should be possible to identify if they depend on the prevailing political economy. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted; revised in FGD ES
21801	4	4	25	0		"prevailing political economy" is also not clear - what shapes choices ranges from the long-held paradigm of "hold the line" protection of private interests/property through to permissive or flexible land-use planning and political pro-development stance - so phrase needs to be explained. [Robert Bell, New Zealand]	Accepted: revised in FGD ES
31339	4	4	26	0	28	If avoiding significant short-term costs is a general constraint it should be identified as such. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statement.
26095	4	4	27	4	27	reads ike a background introduction rather than the key new findings from this assessment [Regine Hock, United States of America]	Noted; revised in FGD ES statements.
19673	4	4	29	4	29	The reference to section 4.4.4.2 is leading to an empty section. [APECS Group Review, Germany]	Accepted
2141	4	4	31	4	32	As a verb "progress" is intransitive. [Robert Kopp, United States of America]	Accepted
6117	4	4	31	4	32	"adaptation can be progressed" - suggest change to "progress can be made with adaptation" [Nina Hunter, South Africa]	Taken into account in revised ES statement.
12079	4	4	31	4	40	Es.14 and Es.5 conflict in terms of conclusion, with the latter concluding that ESL will become common in the future (high confidence) and the former be of deep uncertainty. Please clarify whether the time scales of the two are consistent with additional explanations. [Government of China, China]	Taken into account in revised ES statements.
15663	4	4	31	4	40	Why is the final sentence in this statement based on limited evidence and little agreement being used in a summary conclusion? [EUCE, Belgium]	Taken into account in revised ES statement.
28241	4	4	31	4	40	Can't this be formulated in plainer language? I read the paragraph several times and I still have no idea what it is meant to convey. [Martin Truffer, United States of America]	Taken into account in revised ES statement.
31341	4	4	32	0	37	Doesn't this text also call for specificity and illustrative examples to become more meaningful? [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statement.
16333	4	4	32	4	32	What are decision-analytical methods? [Alexander Nauels, Germany]	Taken into account in revised ES statement.
31343	4	4	42	0		Which are the community-based approaches, e.g.? [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statement.
31345	4	4	49	0	51	This again lacks an illustrative example to guide the development of associated understanding of the reader [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statements.
32319	4	4	53	4	54	The sentence beginning with Hence lacks a verb. Hence, there is merit? [Donald Boesch, United States of America]	Taken into account in revised ES statement.
3627	4	4	56	4	57	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	Noted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9591	4	4	56	5	4	Consider refining the statement. [Government of France, France]	Accepted
31347	4	4	56	5	4	This again lacks an illustrative example to guide the development of associated understanding of the reader [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statement.
29721	4	4	56	5	19	I was surprised not to see mention to the likelihood that , due to sea level rise making extreme conditions worse, even much worse, is going to be contributing to environmental refugees. Some will perhaps stay in their home country, but many are going to emigrate (especially including those on low-lying islands that will be driven off by inundation). This is going to become a very serious issue. [In Miami area, I understand that the rich are moving inland to higher ground, which is where the poor have lived as it was less expensive, buying them out, but forcing them to live at lower elevations and so be at much greater risk than they were.] [Michael MacCracken, United States of America]	Noted - migration and displacement issues are addressed in 4.4.2.6 with a focus on available empirical evidence.
15123	4	5	1	5	1	Consider the term deeply uncertain. It is used in several contexts throughout the Executive Summary. Does this deep uncertainty refer to scenarios after 2100 or does it encompass the IPCC likely range within the next 80 years? It is quite important that SLR scenarios within the next 80 years are not perceived as deeply uncertain - unless they are of course. I would recomment that you more clearly state what (and when) this deep uncertainty covers. [Sofie Schöld, Sweden]	Taken into account in revisions to ES statements and the use of the term 'deep uncertainty' throughout the chapter.
21803	4	5	1	5	4	Misses one of the critical elements of adaptation pathways (in working with uncertainty) - that of the critical role of monitoring and review- where signals and triggers herald when a switch in adaptation pathway is approaching (thus addressing future unertainty on the rate of SLR by monitoring its progression locally). Recent Refs e.g. a) Haasnoot, M, van 't Klooster, S, van Alphen, J (2018). Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environment Change 52: 273-285; b) Lawrence, J, Bell, RG, Blackett, P, Stephens, S, Allan, S (2018). National guidance for adapting to coastal hazards and sea-level rise: Anticipating change, when and how to change pathway. Environmental Science and Policy 82:100-107. [Robert Bell, New Zealand]	Noted and taken into account in revisions to ES statement; and clearly explained in 4.4.4.3.4
29909	4	5	1	5	4	this is vague [Anna Zivian, United States of America]	Accepted; revised in FGD ES

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32047	4	5	1	5	4	It may be useful to add that adaptation pathways can help to overcome policy paralisis due to uncertainty as decisions are unraveled in small steps. Maybe also add definition of adaptation pathways [Marjolijn Haasnoot, Netherlands]	Taken into account in revised ES; and explained in more detail in 4.4.4.3.4
9593	4	5	6	5	6	Section 17 can be switched with section 16, because it is very similar to section 15. [Government of France, France]	Taken into account in revised ES structure and statements.
21805	4	5	6	5	12	Finding #17 should include indigenous knowledge and cultural preferences - there is a whole section on this in Chapter 1 but no mention in the Exec Summary of Chapter 4 to make that link. [Robert Bell, New Zealand]	Taken into account in revised ES statement.
29911	4	5	6	5	12	move to 16, as it is very similar to 15 [Anna Zivian, United States of America]	Taken into account in revised ES statement.
31349	4	5	7	0	12	This again lacks an illustrative example to guide the development of associated understanding of the reader [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statements.
5187	4	5	14	0		ES refers to achieving SDGs, but SDGs do not feature in the main assessment so line of sight on this ES statement is weak. [Debra Roberts and Durban Team, South Africa]	Taken into account in revised ES statement; and addressed in light of available literature in 4.4.6.
2201	4	5	14	5	16	Can more be said about achieving the SDGs. SDG 13 on climate change has specific targets. Can comments be developed more specifically to address the targets? [Poh Poh Wong, Singapore]	Noted - the paucity of literature explicitly linking SLR and SDGs precludes assessment beyond the recognition that SLR will have adverse impacts on achieving SDGs; and hence the brief closing section (4.4.6) on the implications of SLR on SDGs and climate resilient development.
16335	4	5	14	5	19	How is it possible to elevate SDG findings to the ES that are not even covered in the Chapter? The SDG topic in the context of SLR is very important and should be covered. Currently, however, the chapter provides no SDG SLR assessment anywhere. Hence, please delete. [Alexander Nauels, Germany]	Noted - see section 4.4.6 and reference to adverse impacts of SLR on achieving SDGs.
22507	4	5	14	5	19	Suggest this section also address the ongoing nature of SLR beyond 2100. [Government of Australia, Australia]	Taken into account in revised ES statement.
6119	4	5	15	0		Change "level" to "levels" [Nina Hunter, South Africa]	Taken into account in revised ES statement.
5179	4	5	17	0		Need to be able to give some sort of quantification of the number of people impacted in order to further develop the narrative started in SR1.5. [Debra Roberts and Durban Team, South Africa]	Noted: Population at risk addressed in several places, including 4.3.2.2 and 4.3.3.2
31351	4	5	18	0		This again lacks an illustrative example to guide the development of associated understanding of the reader [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised ES statements.
19675	4	5	19	5	19	Missing reference to a section. [APECS Group Review, Germany]	Accepted.
29723	4	5	22	5	22	Apologies for running out of time to review the whole chapter [Michael MacCracken, United States of America]	Noted.
15253	4	6	0	0		While emphasis should be put on SIDS, the assessment should not ignore coastal LDCs which are also extremely vulnerable. Please add LDCs! [Government of Gambia, Gambia]	Noted - we have not used the term LDCs but have referred to low-lying coastal settings in which poverty and deprivation are commonplace as being vulnerable to the impacts of SLR.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26965	4	6	4	6	4	Gregory et al. on terminology recommend calling these phenomena "extreme sea surface height", or "extreme coastal water level" if at the coast. That is because "extreme sea level" can also be used to mean projections of large sea level rise, for which we recommend "high-end sea-level change". Therefore I would suggest you don't use the phrase "extreme sea level" or "ESL" in the chapter. In fact later (page 10 lines 11-12) you comment that by "sea level" you mean "mean sea level", averaging out the variations of the sea surface, so your use of "sea level" in ESL is inconsistent. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we preferred to use extreme sea level events
13921	4	6	9	6	10	It is unclear what 'point of departure' means in this context. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in revised 4.1
25731	4	6	12	6	19	With hundreds of islands and long coastline, impact of sea-level rise on the vulnerable islands and coasts of India could be covered [Government of India, India]	Taken into account in multiple places in sections 4.3 and 4.4, with numerious Indian studies cited.
16337	4	6	18	6	18	Highlighting the SIDS situation is much appreciated. But many vulnerable LDCs have low-lying coastal areas also. Hence, the SIDS narrative should be expanded by also including LDCs [Alexander Nauels, Germany]	4.1 Rewritten. Noted - we have not used the term LDCs but have referred to low-lying coastal settings in which poverty and deprivation are commonplace as being vulnerable to the impacts of SLR.
27225	4	6	18	6	18	It may be prudent to define and/or explain that SIDS is a UN-based designation and that there are several requirements to be classified as a "Small Island Developing State," and it's not a generalized term that can be applied to all small island states that may or may not be in a state of 'developing.' [Michael Schwebel, United States of America]	4.1 Rewritten. Use of the term SIDS has been minimised, with attention focused more on exposure of islands due to low elevaation above sea leve.
21685	4	7	0	0		Figue 4.1; Too busy to follow easily. Should be organized further. [Government of Republic of Korea, Republic of Korea]	Accepted_The figure has been reworked and included in a more integrative new section
24019	4	7	0	0		Figue 4.1; Too busy to follow easily. Should be organized further. [WON SANG LEE, Republic of Korea]	Accepted_The figure has been reworked and included in a more integrative new section
19677	4	7	0	7	0	Figure 4.1:I find the figure not clear to read and understand. Some interactions are missing. For example "Natural variability" also impact on ice sheet and ocean. "Geodynamics" also impact on coastal and sea level change. "Climate variability" shoudl be perhaps reformulated in "Atmospheric variability" because ocean is part of climate. In the "Impacts" I would change "people" by "population". [APECS Group Review, Germany]	Accepted_The figure has been reworked and included in a more integrative new section
13923	4	7	0	7		Figure 4.1 - Figure refers to 'other hazards' what are these? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted_The figure has been reworked and included in a more integrative new section
15583	4	7	0	7		Figure 2.1 is very good and should be highlighted [EUCE, Belgium]	The authors guess the reviewer commented on Figure 4.1 and not 2.1. Thanks for the positive feedback on this figure (that has been improved for the Final Draft).

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28243	4	7	0	7		Fig. 4.1 should be checked carefully. I assume that 'Geodynamics' refers to isostacy and gravitational effects? There should be an arrow from there to sea level change. It is not clear why there is an arrow from 'coastal hazards' via 'other hazards' to the brown box. There are two separate arrows going from 'other hazards' to 'risk'. Why? The 'Natural variability' and 'Anthropogenic Drivers' arrows are convoluted in odd ways that are difficult to decipher [Martin Truffer, United States of America]	Taken into account_The figure has been reworked and included in a more integrative new section
10303	4	7	1	6	1	Figure 4.1. Don't understand the need and significance of this figure?? Are you trying to show coherence of this chapter?? More explaination is needed [Mahmood Riyaz, Maldives]	Taken into account_The figure indeed illustrates the storyline of the chapter. It has been reworked and included in a more integrative new section
576	4	7	1	7	1	Move the "Section 4.2" label closer or perhaps centered over the blue bubbles. The differentiation betweel global and local/regional here is very well outlined here. [Jenna Pearson, United States of America]	Rejected_The figure has however been reworked and included in a more integrative new section
3183	4	7	1	7	1	The information in this schematic is important, but the schematic itself is somewhat confusing and unclear. For example, what is the different between the thick and thin lines, or the solid and dashed lines? It might be helpful to clarify some of the features of the schematic in the caption, or organize this information in a different manner, such as a table or a paragraph. [Sloane Garelick, United States of America]	Taken into account_The figure has been reworked and included in a more integrative new section
3951	4	7	1	7	1	This figure is confusing with many arrows and paths. It can be replaced with just a schematic figure of all secitons of this chapter without the interconnections shown. May be a single line in the captions saying all sections are [Aakash Sane, United States of America]	Taken into account_The figure has been reworked and included in a more integrative new section
22041	4	7	1	7	1	Figure 4.1: the links are not clear on this Figure. In particular on the left side of the figure. I do not see what are the anthropogenic drivers and natural variability from there. [Julia Pfeffer, Australia]	Taken into account_The figure has been reworked and included in a more integrative new section
32049	4	7	1	7	1	Climate resilient development pathways is missing. This could be added in the box on risk [Marjolijn Haasnoot, Netherlands]	Rejected_The figure is used to illustrate the storyline of the chapter, and only headings of main sections are used here.
33431	4	7	1	7	1	Impacts box doesn't account for estuarine or coastal impacts (e.g., modification of barrier islands or submerged bathymetry structures) that aren't necessarily readily classified as only "land, ecosystems, resources, people and activities." [Government of United States of America, United States of America]	Taken into account_The figure has been reworked and included in a more integrative new section
1673	4	7	1	7	2	The small arrows are unnecessary and confusing. The general layou and content t is good, include the section numbers within the boxes. [Nora Richter, United States of America]	Taken into account_The figure has been reworked and included in a more integrative new section

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26097	4	7	1	10	5	Alhough very nicely written this section is quite long and may be shortened. The new findings are only touched on and when mentioned are repetition of what comes later. Can this be shortened to avoid repetition and increase readability? [Regine Hock, United States of America]	Taken into account_The authors wrote a completly new integrative section.
4669	4	7	6	7	17	There is some repetition between this introductory paragraph and following section that is not necessary. [Debra Roberts and Durban Team, South Africa]	Taken into account in rewritten 4.1
17533	4	7	8	7	13	Rate of SLR tied to rate of warming, which can be slowed through reductions of SLCPs. Hu A., et al. (2013) Mitigation of short-lived climate pollutants slows sea-level rise, NATURE CLIMATE CHANGE 3:730–734; UNEP & WMO (2011) INTEGRATED ASSESSMENT OF BLACK CARBON AND TROPOSPHERIC OZONE: SUMMARY FOR DECISION MAKERS. [Kristin Campbell, United States of America]	Focus here is assessing post-AR5 literature.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17643	4	7	8	7	13	Rate of SLR tied to rate of warming, which can be slowed most quickly through reductions of SLCPs. Hu A., et al. (2013) Mitigation of short-lived climate pollutants slows sea-level rise, NATURE CLIMATE CHANGE 3:730–734, 732 ("In comparison with the BAU case, mitigation of SLCPs can reduce the SLRfull rate by about 18% (from 1.1 cm yr–1 to about 0.9 cm yr–1), and the SLRther rate by about 48% (from 0.29 cm yr–1 to 0.15 cm yr–1), with negligible effect from CO2 reduction before 2050. By 2100, however, CO2 mitigation can reduce the SLRfull rate by about 24% (from 2.1 to 1.6 cm yr–1), and the SLRther rate by about 25% (from 0.4 to 0.3 cm yr–1). The SLCP mitigation would contribute about 24% of the SLRfull rate reduction, and 54% of the SLRther rate at 2100. With mitigation of both SLCPs and CO2, the projected SLR rate is reduced by close to 50% for SLRfull, and 67% for SLRther by 2100."); UNEP (2017) The Emissions Gap Report, xv ("The report also covers an assessment of the potential contribution from reductions in short-lived climate pollutants (SLCPs), although they are not directly comparable with reductions in long-lived greenhouse gases. Reductions of SLCPs limit the rate of short-term warming, and when sustained and combined with CO2 reductions, these reductions also help to limit long-term warming, which is the ultimate aim of closing the emissions gap."); Xu et al 2013 ("This estimate is consistent with RX10, which would also yield 0.5 C avoided warming if only CH4, O3, and BC were mitigated. All three studies calculated that full implementation of mitigation measures for these three SLCPs can reduce the rate of global warming during the next several decades by nearly 50%. Furthermore, Arctic warming can be reduced by two-thirds over the next 30 yr compared to business as usual (BAU) scenarios (UNEP and WMO, 2011)."); UNEP & WMO (2011) INTEGRATED ASSESSMENT OF BLACK CARBON AND TROPOSPHERIC OZONE: SUMMARY FOR DECISION MAKERS, 10–11 ("When all measures are fully implemented, warming during the 2030s relative to the present day is only half as much as if no measures had been implemented. In contrast, even a fairly aggressive strategy to reduce CO2 emissions under the CO2 measures scenario does little to mitigate warming over the next 20–30 years. In fact, sulphate particles, reflecting particles that offset some of the committed warming for the short time they are in the atmosphere, are derived from SO2 that is co-emitted with CO2 in some of the highest-emitting activities, including coal burning in large-scale combustion such as in power plants. Hence, CO2 measures alone may temporarily enhance near-term warming as sulphates are reduced…;temperatures in the CO2 measures scenario are slightly higher than those in the reference scenario during the period 2020–2040)."). [Durwood Zaelke, United States of America]	Focus here is assessing post-AR5 literature.
31353	4	7	9	0	12	missing the point in SR1.5 and literature that there is a tipping point with highest probability between 1.5 and 2°C global warming which would/could lead to accelerated multi-metre sea level rise beyond 2100, even in a 1.5°C warmer world. This perspective is not (sufficiently and explicitly) taken up by this report? [Hans-Otto Poertner and WGII TSU, Germany]	The 1.5 report argues that SLR is 10 larger in 2100 for a 2 degree scenario than for a 1.5 scenario. It further argues that the chance to pass a tipping point is larger for a 2 degrees scenario than for a 1.5 scenario. The 1.5 report is not arguying that there is a tipping-point between 1.5 and 2 degrees.
15133	4	7	13	7	15	This is a strange remark on the likely range. First, there multiple ranges, one for each climate scenario. Two of these ranges are narrower than AR5 (RCP2.6, RCP4.5) and one is wider (RCP8.5). [Dewi Le Bars, Netherlands]	This phrase intended to report the likely range for the RCP8.5 scenario only but is removed
16339	4	7	13	7	15	This very important statement should be elevated to the ES, as the existing ES paragraphs do not communicate this clearly enough. [Alexander Nauels, Germany]	The ES has been reworked and is lined up with the final projection values and its uncertainty ranges

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4671	4	7	14	7	17	Line 15 could be deleted, and "characteristics of tropical and extratropical cyclones" could be tagged on to "hydrocarbon withdrawal" in line 14. This avoids repetition and makes one list of items that add uncertainty. "Several of these uncertainties" - could you specify which have been included since AR5 and which have not? Or is this picked up later? [Debra Roberts and Durban Team, South Africa]	Noted - 4.1 has been rewritten
31355	4	7	15	0	16	Not clear what “muted “means here as the evidence is not presented. Does this contradict/deny the existence of such a tipping point and what are the low emissions scenarios? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted and taken into account in revised 4.1
15057	4	7	15	0		It is not clear what "the dynamical response is muted" refers to here. The expression could be understood as a modelling choice in certain set-ups. Please clarify what is meant by "muted". [Government of Germany, Germany]	Accepted and taken into account in revised 4.1
2143	4	7	21	4	22	Is this strictly true? There statement takes the low end of the likely range from RCP 2.6 and the high end of the likely range from RCP 8.5, and while one can make a case for an integrative analysis across RCPs that yields these likely ranges, I don't think it's correct to attribute it to AR5. [Robert Kopp, United States of America]	agreed this is not a likely range as it goes across scenarios
26967	4	7	21	7	21	The WG1 AR5 did *not* give a single scenario-independent likely range. That cannot be done without attributing probabilities to the scenarios. Such probabilities are not known. If you give a range across scenarios, you cannot call it "likely". [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	agreed this is not possible
15135	4	7	22	7	22	There are multiple likely ranges, one for each emission scenario, not only one. Here what is done it to take the lower bound of the likely range for RCP2.6 and the upper bound of the likely range of RCP8.5 and to call it a likely range. It is a complete reinterpretation of the AR5 results and it is not mathematically consistent. [Dewi Le Bars, Netherlands]	agreed this is not possible
6121	4	8	2	0		Sometimes "meter", sometimes "metre" - needs to consistently be referred to [Nina Hunter, South Africa]	To be addressed in proofing of final FGD
31357	4	8	6	0	9	As before, this wording is not clear on what the options are. SR1.5 did include those in the wording which sent a much clearer message. The focus on the words ”deep uncertainty” may provide an excuse not to identify the dimensions of change which, however, could/would blur the picture more than it helps a better understanding? Also, deep uncertainty should not lead policymakers to ignore the extremely high risk that may build up over centuries with multimeter sealevel rise, due to the dimension of potential change. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in revised 4.1
6123	4	8	8	0		Change "inhibits" to "inhibit" [Nina Hunter, South Africa]	To be addressed in proofing of final FGD

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
16341	4	8	8	8	8	Please add 'distribution' to 'tail'. [Alexander Nauels, Germany]	To be addressed in proofing of final FGD
11775	4	8	13	8	13	An important point has been missed here. Add something like " In addition, maladaptive responses increase perceptions of 'safety' and expectations of increasing levels of hard protection, which may not be realised due to limited resources and leading to civil unrest." One reference that addresses this issue is Lawrence, J., et al., Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers. Local Environment, 2015. 20(3): p. 298-320. [Judy Lawrence, New Zealand]	Taken into account in revised 4.1
6125	4	8	15	0		Should "on" not be "in"? [Nina Hunter, South Africa]	Taken into account in revised 4.1
31359	4	8	27	0	28	WOuldn't it be more precise to cite the Synthesis Report where such progress was really made? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted; addressed in 4.3.4.1
4673	4	8	28	0		Remove "Ability to perform a" for clarity. [Debra Roberts and Durban Team, South Africa]	Noted - 4.1 has been rewritten
264	4	8	28	8	28	A possible reference to include in this sentence is Reidmiller et al., 2018. These authors highlight the effects for Alaska (chapter 26). Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.) 2018. U.S. Global Change Research Program, Washington, DC, USA. doi: 10.7930/NCA4.2018. CH26, 153-156. [M.Dolores Garza-Gil, Spain]	Noted - 4.1 has been rewritten
16443	4	8	37	8	45	The occurrence of tsunami in Palu [dated September 28, 2018] was caused by a combined of sea landslide and liquefaction triggered by in land earthquake (7.8SR), the incidence of which is not many in the world and therefore has not been addressed (related also with 4.3.1page 4.6.7 line 39 till 53 and also related with line 1 – 5 of page 4-68). The mentioned item is also related with Assessment of Vulnerability to multiple hazards simultaneously (page 4-68, line 49). The shifting of the vast land surface towards the coast due the liquefaction is thought to bring an impact on the SLR pattern (non-climatic factor to be likely occurred), alters the spatial coverage, threatening the coastal ecosystem, which seems to have an effect on the climatic pattern in the long term and, in turn, requires transformative adaptation approach that might rather different from normally be applied, especially those who will live in the surrounding area – the phenomena seems to need be addressed for it rarely occur in the world [Andi Eka SAKYA, Indonesia]	Noted - the focus here is on assessing available post-AR5 literature
31361	4	8	39	0		Can adaptation limits be quantified / qualified? [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account in assessment of effectiveness of SLR response options (4.4.2)

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11567	4	8	44	8	44	I think that 'storm tides' should be replace with 'storm surge', which is actually a more known term. In addition, all the rest of the chapters use 'storm surge' and not 'storm tides' [Luca Castrucci, United States of America]	Taken into account in revised 4.1
9595	4	8	49	8	49	Referencing the issue of scale in this section would be useful ; two sections that are still just placeholders are referenced in this section (4.4.4.2, 4.4.4.3) so it is important to make sure that those sections do address the issues raised here. [Government of France, France]	Taken into account in revised 4.1.
4675	4	9	4	0		"This literature includes…" [Debra Roberts and Durban Team, South Africa]	Taken into account in revised 4.1
11435	4	9	12	9	14	It is also worth to mention there's a halosteric component that drives GMSL. [Anson Cheung, United States of America]	Noted - halosteric influences are noted in 4.2.1.3, 4.2.2.4 and 4.2.3
4677	4	9	13	0		Please define "accommodation" clearly, separate from "retreat" [Debra Roberts and Durban Team, South Africa]	Accepted
29913	4	9	14	9	16	add something on relevance of scale here [Anna Zivian, United States of America]	Taken into account in revised 4.1.
4679	4	9	21	0		What are "informal institutional provisions"? How is this related to informality? [Debra Roberts and Durban Team, South Africa]	Taken into account in revised 4.1
10305	4	9	23	9	24	Should have focused on the pogress made since AR 5 [Mahmood Riyaz, Maldives]	Taken into account in revised 4.1
11777	4	9	25	9	27	There are recent additional examples in real-life decision contexts to add here. Lawrence J., R. Bell, and A. Stroombergen, A hybrid process to address uncertainty and changing climate risk in coastal areas using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis. Sustainability, 2019. Special Issue Policy Pathways for Sustainability(accepted in press). This paper is based on adaptation pathways through a participatory community decision process with novel governance arrangements. [Judy Lawrence, New Zealand]	Noted and addressed in SLR response section (4.4) including citation of this article.
29915	4	9	27	9	27	and what about non-economic decision-analytical tools? [Anna Zivian, United States of America]	Noted - 4.1 has been rewritten and our use of the term decision analysis / decision analytic tools is explained in 4.4.4.3
6127	4	9	31	0		Suggest replacing "about" with "as" [Nina Hunter, South Africa]	Noted
6129	4	9	32	0		Change "lights" to "light" [Nina Hunter, South Africa]	Noted
4681	4	9	40	0		"thinking about how to enable" can be deleted for clarity. [Debra Roberts and Durban Team, South Africa]	Noted - 4.1 has been rewritten.
19681	4	9	40	9	41	A short description of adaptation pathways concept would make it easier to follow, or at least to give a reference or IPCC section where it's explained. [APECS Group Review, Germany]	Noted - adaptation pathways is explained in 4.4.4
9597	4	9	40	9	44	This paragraph could use more detail. [Government of France, France]	Noted - 4.1 has been rewritten.
29917	4	9	40	9	44	a bit more detail here would be useful [Anna Zivian, United States of America]	Noted - 4.1 has been rewritten

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13925	4	9	47	9	54	This sentence makes it sound as if the science around SLR is regressing i.e. that uncertainty in our estimates is increasing, rather than there being greater uncertainty in longer-term projections. Could you rephrase this paragraph slightly to better reflect this? For example, replacing "growing" with "greater" -> "These aspects are 1) greater uncertainty in projections of climate change as 2100 is approached, due to large differences between the RCPs beyond 2050…". [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account in rewritten 4.1
33433	4	9	51	9	53	Implies that some components of climate models, like waves and tides, that are missing need to be included. How can this assessment be made when these processes are explicitly missing from many current climate models? [Government of United States of America, United States of America]	Noted and taken into account in revised 4.1
4683	4	9	52	0		"occurrence of" can be removed for clarity. [Debra Roberts and Durban Team, South Africa]	Noted and taken into account in revised 4.1.
9599	4	9	53	9	54	Are implications just for timing, or also for extent and selection? [Government of France, France]	Noted and taken into account in revised 4.1.
29919	4	9	54	9	54	just for timing, or also for extent and selection? [Anna Zivian, United States of America]	Taken into account in revised 4.1.
32051	4	9	54	9	54	Not only the timing but it also affect the availability of options/ [Marjolijn Haasnoot, Netherlands]	Taken into account in revised 4.1
6131	4	9	56	0		Insert "the" before "post-AR5" [Nina Hunter, South Africa]	Taken into account in revised 4.1
19679	4	9	56	10	5	Perhaps it is worth mention that adaptation to natural hazards will als mitigate the risks. This socio-economical feedback is missing. [APECS Group Review, Germany]	Noted and addressed in revised ES
4025	4	10	0	58		The whole 4.2 Section provided strong and many evidence in the discussion. However, some of the simlar studies can be combined and discussed simulteneously rather than took one paragraph on each of the studies. Subtopics of too lenthy may cause readers to lose the links between the subtopics, and affect the interpretation of the message we are trying to present. Therefore, summarise on some of the parts are encouraged. [Lim Lee-Sim, Malaysia]	The section 4.2 has been reduced in the FD
5181	4	10	0	60		The almost 30 pages of dense scientific text is a real barrier for most policy makers - could some of the detail be reduced with just the main messages of change being conveyed? Discussion of responses only starts on pg.89 That would also help in reducing the length of the chapter. [Debra Roberts and Durban Team, South Africa]	There is a new introduction annex integrative section in the FD which should overcome this
22511	4	10	0	66		Suggest including a short summary statement at the end of each subsection of Section 4.2 since it is a very long section. Overall, however, Section 4.2 was a useful section to summarise the basis for the SLR and context. [Government of Australia, Australia]	We thank the reviewer for his appreciation of 4.2 and included more summary statements

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4685	4	10	4	0		"imperative" sounds prescriptive. Suggestion: "of this century. The projected acceleration of SLR suggests a growing need to institutionalize climate resilient development pathways." [Debra Roberts and Durban Team, South Africa]	"imperative" removed.
9601	4	10	5	10	5	Refers to section 4.4.6, which does not exist – it looks like 4.4.7 is misnumbered and should be 4.4.6 (it is currently a placeholder). [Government of France, France]	Section completely rewritten.
32343	4	10	7	66	2	Because of the limited time I had availablity, the section on the Physical Basis for Sea Level Change and Associated Hazards is the only section I could review carefully. It is also the topic on which I have the most current awareness of the recent literature. I found the treatment and analysis comprehensive, up-to date and well reasoned. Other than my comments concerning careful expression and clear emphasis, I have no substantive concerns about this section of Chapter 4. [Donald Boesch, United States of America]	We thank the reviewer for his appreciation of section 4.2
2469	4	10	9	0	32	This paragraph fives the impression that the regional pattern of sea level rise comes from the mass fingerprints only. However, regional changes in climate also result in a regional distribution of sea level rise. [John Church, Australia]	We agree this has been clarified
4687	4	10	9	0		Are the terms "sea level changes (SLC)" and "Global mean sea level (GMSL)" really necessary? Alongside SLR, ESL, RSL - all these closely related terms are very confusing. [Debra Roberts and Durban Team, South Africa]	SLC is removed, the other terms are necessary
19693	4	10	10	10	10	"can cause increased level of risk for" = threatens ? [APECS Group Review, Germany]	agreed
11779	4	10	10	10	11	The title Coastal Cities and megacities leaves out many small settlements that together constitute many people in the world who live in low-lying rural or isolated locations. They are not all in Deltas either. Many are indigenous communities but not all and often they get less attention from policy decisions. It would be good to see this covered in Figure CCB7.2 and somewhere in this report. [Judy Lawrence, New Zealand]	we agree, but we don't use the word megacities here, so no change needed at this point
13927	4	10	11	10	11	It is unclear what 'time mean' means. Is it referring to an average? Please explain. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	changed mean in average to clarify
15137	4	10	11	10	12	No mention of interanual/decadal modes of natural climate variability in the definition. How is this treated? Needs to be clear. [Dewi Le Bars, Netherlands]	correct this is only introduced where it is used the first time in the observational section
19695	4	10	11	10	12	"sea level in the general sense is used here" is not clear. I propose "Sea level in this context is defined as the time mean of the sea surface, eliminating short term fluctuations like waves, surges and tides." [APECS Group Review, Germany]	agreed and adjusted accordingly

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33435	4	10	11	10	12	"Short-term fluctuations are responsible for flooding." Should this hard-cut distinction be made? Some more clarification here would be helpful. Based on following text maybe just an additional statement like "in contrast to relative sea level" would be helpful. [Government of United States of America, United States of America]	The flooding events are discussed towards the end of the paragraph so we believe this point is already captured
19683	4	10	11	10	14	Suggestion to make the text shorter: “The term Sea level is used here as the time mean of the sea surface eliminating short duration fluctuations like waves, surges and tides. Global mean sea level (GMSL) rise refers to changes in the volume of the ocean water caused by thermal expansion, and by mass changes caused by loss of land ice or changes in terrestrial water reservoirs.” [APECS Group Review, Germany]	agreed changed
19697	4	10	12	10	13	There is confusion in the sentence since the sentence deals with GMSL rise and volume and mass changes that can either increase, either decrease. Please be clearer. I suggest to use increase because we speak about GMSL rise. [APECS Group Review, Germany]	agreed changed accordingly
19703	4	10	12	10	13	Perhaps adding a general equation to explain sea level rise? [APECS Group Review, Germany]	we prefer to keep it descriptive for the wider audience
22043	4	10	12	10	13	GMSL rise is the globally averaged rise in sea level caused by […] [Julia Pfeffer, Australia]	sentence is rephrased
19685	4	10	13	10	13	I suggest to add "salinity" to thermal expansion. [APECS Group Review, Germany]	no the salinity effect is neglible on the global scale
19699	4	10	14	10	17	Proposed new formulation: " Mass changes due to the redistribution of water on the Earth's surface and elastic deformation of the lithosphere leads to a change in the Earth's rotation and gravitational field, thus producing a distinct spatial patterns in regional sea level rise, often called fingerprints." [APECS Group Review, Germany]	agreed changed accordingly
19691	4	10	15	10	15	I would substitute "sea level rise" by "sea level change" since fingerprints corresponds to an instantaneous state of sea-level -related graviational signal, thus including both sea level rise and sea level drop. [APECS Group Review, Germany]	agreed changed accordingly
26969	4	10	15	10	15	Gregory et al. on terminology recommend avoiding the term "fingerprint", because this is also used in detection and attribution to mean the response to forcing (as on page 29 line 9). This group of effects (gravity, rotation, deformation) are called "GRD" in the terminology paper. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we have removed the word fingerprint here
3953	4	10	15	10	17	sentence at line 15 “These fingerprints…” …I think a citation is needed here. [Aakash Sane, United States of America]	obsolete text has been rephrased and fingerprint is not used any longer

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22045	4	10	15	10	19	this part of the text is somewhat inaccurate. The definition of GIA varies among authors, which may or may not include presen-day ice-melting and may or may not be treated as fingerprints. Suggested changes: "Sea level fingerprints represent the changes in the Earth's shape and gravity field caused by thecontemporary redistribution of ice and water masses at the Earth's surface. Besides, the solid Earth still responds to the melt of continental ice-sheets from the last glacial maximum(~ 21 kyr BP) and is still in a state of disiquilibrium caused by Glacial Isostatic Adjustement. In addition to these effects, the solid Earth may cause changes in sea level due to tectonics, mantle dynamicsand human activity". Note this reference providing a review of the solid earth contribution to comtemporay sea level changes: Pfeffer, J., Spada, G., Mémin, A., Boy, J. P., & P. Allemand, 2017, Decoding the origins of vertical land motions observed today at coasts. Geophysical Journal International, 210 (1), 148-165, doi:10.1093/gji/ggx142 [Julia Pfeffer, Australia]	we follow the terminology as proposed in Gregory et al. 2019 and do not use any longer the term fingerprint which circumvents the ambiguity raised by the reviewer
19701	4	10	17	10	18	I think it would be helpful for meteorologist and geography majors to understand if spatial scale in degree is added for eg. ….spatial scales of around 100km (~1.0 degree), while local sea level refers to spatial scales smaller than 10km (~0.1 degree). [APECS Group Review, Germany]	we don't agree because the depends strongly on the latitude, 1 degree is far less at high latitudes. 1 degree may get close to local sea level at high latitudes
28585	4	10	18	10	18	Wording is ambiguous. For the sentence that starts on this line suggests something like: "In addition to the regional changes/fingerprints associated with contemporary ice and water redistribution, the solid Earth..." [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	text has been rephrased to clarify this
2145	4	10	19	4	19	Is "glacial isostatic adjustment" intended to include elastic deformation as well? What about elastic deformation driven by non-glacial loads? [Robert Kopp, United States of America]	we agree but don't want to complicate the introduction further
19687	4	10	19	10	19	Add after: “glacier isostatic adjustment.” reference to section 4.2.1.5 to indicate the reader where to find more information regarding these Geodynamic processes. Some readers might not be familiar with the terms. [APECS Group Review, Germany]	added
4689	4	10	19	10	20	Could you rephrase the following for a more general audience? "tectonics, mantle dynamics or glacial isostatic adjustment." eg "the movement of continental shelves, the convection and subduction movements inside the mantle, or the rebound movement of land once covered by glaciers." In line 20 correct "cause" not "causes". [Debra Roberts and Durban Team, South Africa]	see previous comment more explanation provided in section 4.2.1.5

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2147	4	10	23	10	23	"Regional and relative" is a category mismatch -- one is a spatial scale, the other a type of measure. Reads awkwardly. [Robert Kopp, United States of America]	agreed removed regional as it is implicit in the framing of most regions
22047	4	10	23	10	23	" a few mm/yr": up to a a few cm/yr in some places (especially for regions where vertical displacement is important at the coast such as former ice-sheets or anthropized coastal areas, see comments 3 and 7). The figure 4.4 does not give rates, therefore does not directly support this estimation. [Julia Pfeffer, Australia]	Figure 4.4 shows changes in the order of several hundred of mm change over 100 years so it backs up few mm/yr
13929	4	10	25	10	26	This sentence notes that 'gradual changes in time and space have to be assessed together with processes that lead to flooding events'. In terms of hazards from SLR this is wider than flooding and should include erosion for example. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	added erosion
11573	4	10	26	10	26	'storms, surges,' should not be separated by a comma since it is a single process [Luca Castrucci, United States of America]	agreed changed
2433	4	10	26	10	27	The way compound events are defined here excludes the influence of freshwater inflow, which is particularly important in the genesis of exreme water level events in deltas and estuaries (which are often poulation hotspots). A lot of work has been done on the topic in recent years at the local, continental, and global scale. I feel that this is not well reflected here, including Figure 4.2 (although compound events are discussed again further down in 4.3.4.1 under conclusions (which I found a bit strange), but more in a risk context, and in Box 4.1 the backwater effect is mentioned; there is also a section on compound extremes in chapter 6, which should be alligned with what is written in chapter 4 and vice versa). [Thomas Wahl, United States of America]	to prevent confusion we removed the word compound here
13931	4	10	26	10	27	What is the definition of 'extreme sea level' events used in this chapter? Please explain. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	we have rephrased the text to clarify and added a reference to figure 4.2 which also explains this term
21807	4	10	26	10	27	Compound ESL events can and often include coincidental river/stream flooding and/or pluvial flooding. E.g. Ref: Ward et al. (2018). Dependence between high sea-level and high river discharge increases flood hazard in global deltas and estuaries. Env Res Letters, Environ. Res. Lett. https://doi.org/10.1088/1748-9326/aad400 . Also relates to Section 4.3.4.1. [Robert Bell, New Zealand]	we removed the wording compounding here
31183	4	10	34	0		This section is partly still text-book style. Can be shortened by focusing on new findings. [Hans-Otto Poertner and WGII TSU, Germany]	we shortened this

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2735	4	10	34	10	50	Swapna et al (2017) found that North Indian Ocean sea level has increased significantly during last few decades. Analyses of long-term climate data sets and ocean model sensitivity experiments indicate that North Indian Ocean sea level rise is accompanied by a weakening summer monsoon circulation which has resulted in reduced upwelling off Arabia and Somalia and decreased southward heat transport, and corresponding increase of heat storage in the North Indian Ocean. These changes in turn lead to increased retention of heat and increased thermosteric sea level rise in the North Indian Ocean, especially in the Arabian Sea. Swapna et al., 2017, Multidecadal weakening of Indian summer monsoon circulation induces an increasing northern Indian Ocean sea level. Geophysical Research Letters, 44, 10,560–10,572. https://doi.org/10.1002/ 2017GL074706 [Thian Yew Gan, Canada]	RSL due to circulation changes is discussed later in 4.2 not in the introduction
22049	4	10	34	11	8	Importants elements are missing in this paragraph. It focused on contributions of ice-sheets and glaciers to sea level rise but does not mention the work of Shepperd et al., 2012; Gardner et al., 2013; Shepperd et al., 2018 and Parkes & Marzeion, 2018 who provided an assessment of ice-sheets and glaciers contribution among difeerent techniques available, including GRACE-based assements and surface mass balance assessments. Reference 1: Shepherd, A., Ivins, E.R., Geruo, A., Barletta, V.R., Bentley, M.J., Bettadpur, S., Briggs, K.H., Bromwich, D.H., Forsberg, R., Galin, N. and Horwath, M., 2012. A reconciled estimate of ice-sheet mass balance. Science, 338(6111), pp.1183-1189; Reference 2: Gardner, A.S., Moholdt, G., Cogley, J.G., Wouters, B., Arendt, A.A., Wahr, J., Berthier, E., Hock, R., Pfeffer, W.T., Kaser, G. and Ligtenberg, S.R., 2013. A reconciled estimate of glacier contributions to sea level rise: 2003 to 2009. science, 340(6134), pp.852-857. Reference 3: Shepherd, A., Ivins, E., Rignot, E., Smith, B., Van Den Broeke, M., Velicogna, I., Whitehouse, P., Briggs, K., Joughin, I., Krinner, G. and Nowicki, S., 2018. Mass balance of the Antarctic Ice Sheet from 1992 to 2017. Nature, 558, pp.219-222; Reference 3: Parkes, D., & Marzeion, B. (2018). Twentieth-century contribution to sea-level rise from uncharted glaciers. Nature, 563(7732), 551. [Julia Pfeffer, Australia]	Shepherd et al. 2012 is referenced; for small glaciers we only concentrate on projections so Gardner is not needed, the IMBIE paper shepherd et al. 2018 is used and the Parkes paper is only referenced in the FD as it was not published at the time of SOD

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3185	4	10	34	13	4	In this section (4.2.1: Processes of Sea Level Change), is it possible or beneficial to include confidence levels? For example, what is the confidence level that each process is contributing a significant amount to overall sea level change? [Sloane Garelick, United States of America]	this is not possible in a general context and can only be done at local level if at all
11535	4	10	34	27	11	It is not clear why so much material on the physical drivers of sea level change is in this chapter and not in Chapters 3 and 5. Chapter 4 would be most useful if it focused on the impacts and implications for coasts and island and less on the drivers of sea-level, largely the province of the ocean and polar regions chapters. In particular this chapter would be most useful focussing on local contributors to relative sea-level change such as groundwater extraction oil and gas extraction, etc. [William Howard, Australia]	we carefully considered to prevent overlap between the chapter and one section of the SOD has been moved to chapter 3 in the FD
22509	4	10	34	27	11	Suggest this chapter focus on the impacts and implications for coasts and islands, and local contributors to relative sea-level change - and less on the drivers of sea-level, which is largely the province of the ocean and polar regions chapters. It is unclear why so much material on the physical drivers of sea level change is in this chapter and not in Chapters 3 and 5. [Government of Australia, Australia]	see previous comment
19705	4	10	36	10	37	"sea level changes…….feature of climate change" can be removed. [APECS Group Review, Germany]	removed
578	4	10	36	10	57	They historical context provided in this paragraph is exceptionally well done. [Jenna Pearson, United States of America]	the reviewer is thanked for the compliments but pressure on space reduced this section by 50%
19689	4	10	37	10	40	Suggestion to replace “based in part” with “partially based”: “In the early 1990s, observed changes in the polar ice sheets covering Greenland and Antarctica were small, and the general understanding, partially based on numerical ice sheet models (e.g., Huybrechts, 1994) estimating global ice volume changes, was that they would not provide a major contribution to future sea level on decadal or even century timescales.” [APECS Group Review, Germany]	removed
19707	4	10	40	10	40	Please change century by centinnial. [APECS Group Review, Germany]	removed
26971	4	10	40	10	42	It is still the prediction of models that snowfall will increase on Antarctica, which is a negative contribution. This phrasing could be understood to mean that's been disproved. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
25219	4	10	40	10	43	There is now evidence that atmopsheric warming has increased snowfall in Antarctia during the 20th century. Suggested text addition. "Recent evidence from Antarctic ice cores reveal that snowfall (SMB) has increased at a rate of 7 Gt per decade since 1800 AD (Thomas et al., Climate of the Past, 2017). The increases during the 20th century are consistant with warming surface temperatures and have mitigated global sea levels by 10 mm (Medley and Thomas, Nature Climate Change, 2019). [Elizabeth Thomas, United Kingdom (of Great Britain and Northern Ireland)]	removed
6133	4	10	42	0		Replace "dominate" with "dominant"? [Nina Hunter, South Africa]	removed
21809	4	10	42	0		Typo - should be "dominant" [Robert Bell, New Zealand]	removed
32321	4	10	42	10	42	dominant not dominate [Donald Boesch, United States of America]	removed
26099	4	10	44	10	44	calving: true but submarine melt should also be mentioned here, since this is a field where enormous progress has been made in recent years (including acknowledging its dominant role in mass losses at the ice-ocean interface. [Regine Hock, United States of America]	added
10307	4	10	45	10	47	The view on the potential role of ice sheets in future sea level rise changed by the time of AR4 (Lemke et al., 2007), following the first convincing signs of increased ablation rates in Greenland and increased rates of ice discharge into the ocean around Antarctica. This sentence can be deleted [Mahmood Riyaz, Maldives]	removed
33437	4	10	46	10	47	Increased dynamic discharge from Greenland (via accelerating outlet glaciers) was also highlighted and discussed in AR4 (changes in Greenland's outlet glaciers in the late '90's and early '00's were one of the major pieces of evidence arguing for changes in polar ice sheets that we didn't understand and that models of the time could not explain or mimic). As written here, it sounds like Greenland ice sheet SMB was of primary interest at that time but in fact Greenland ice sheet dynamics were of equal or more interest. [Government of United States of America, United States of America]	removed
28245	4	10	47	10	47	Increased discharge is not unique to Antarctica and in fact it was increased discharge from Greenland that contributed much to the recognition that ice dynamics must be considered for assessing sea level rise [Martin Truffer, United States of America]	removed
33439	4	10	54	10	54	"... a single process based case study." This is not accurate. Arguably, there were a number or reasonable process-based model studies reported on at the time of AR5. [Government of United States of America, United States of America]	we have no clue which process based studies the reviewer has in mind so we cannot adjust it
26973	4	10	57	10	57	Actually you talk a lot about GMSLR in the chapter; the whole first page of the Exec Summ is concerned with it. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we agree and rephrased the sentence

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19713	4	11	2	11	8	This entire section should be placed between line 14 and line 15, page 4-10. [APECS Group Review, Germany]	this section has largely been removed
1813	4	11	5	11	8	Page 4-11, Lines 5-8 Care is required here in concluding that GMSL is accelerating. There have been multiple lines of evidence over recent years highlighting the vexing conundrum of a distinct lack of acceleration evident over the altimetry data era. Recent studies such as the Watson et al (2015) and Nerem et al (2018) research advised, have only identified the presence of a weak acceleration after accommodating adjustments for altimeter drift bias in the early portion of the altimetry record and postulating the modelled impact of the Pinatubo eruption, respectively. In particular, the work of Watson et al 2015 detects acceleration only after applying a 2nd order polynomial to the revised data and inspecting the quadratic term. Such analyses, whilst convenient, are not capable of accurately discerning the distinctly non-linear, time varying characteristic of mean sea level velocity, and in turn associated accelerations. The limitations of measuring acceleration via these simple tools are well described in Rahmstorf and Vermeer (2011) and Watson (2016, 2018a). In any case, the largest, detailed regional studies of mean sea level involving the longest tide gauge records around the USA and Europe (Watson, 2016, 2017a) provide a more realistic appreciation of acceleration using more advanced analyses with more circumspection around the evidence for positive acceleration at present (refer also detailed discussion in “General Comment” above). References: Rahmstorf, S., and Vermeer, M., 2011. Discussion of: Houston, J.R., and Dean, R.G., 2011. Sea-Level Acceleration Based on U.S. Tide Gauges and Extensions of Previous Global-Gauge Analyses. Journal of Coastal Research, 27(3), pp.409-417. Journal of Coastal Research, pp.784-787. Online publication date: 1 Jul 2011. Nerem, R. S. et al., 2018: Climate-change–driven accelerated sea-level rise detected in the altimeter era. Proceedings of 44 the National Academy of Sciences, doi:10.1073/pnas.1717312115. Watson, C. S. et al., 2015: Unabated global mean sea-level rise over the satellite altimeter era. Nature Climate Change, 35 5 (6), 565-568, doi:10.1038/nclimate2635.	removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22051	4	11	5	11	8	Large uncertainties remain on the quantification of processes contributing to GMSL rise (ice-sheets, glaciers, thermal expansion but also vertical land motions and GIA). The predominance of ice-sheets and glaciers to the GMSL budget is admittidely significant, but still recent (robust assessements start in 2005). It is difficult to extrapolate such results on longer time scales. Also, as mentionned later in the report, steric sea level changes, and in particular thermosteric changes, are responsible for themajor part of the regional variability in sea level changes (at least during the satellite altimetry era). I would therefore be more cautious in the importance given to ice sheets and glaciers in the text, and maintain thermal expansion as an important contributor. [Julia Pfeffer, Australia]	removed
33441	4	11	5	11	8	Should this have a "strong confidence, low uncertainty" designation? This would be reasonable (and is obvious given the reference list that could be extended to be even earlier in time, not just since 2015). At present, having only recent references suggests that this is just something we've learned recently, which isn't the case. Should be consistent with Section 4.2.2.2.1. [Government of United States of America, United States of America]	removed
2471	4	11	6	0	7	It is not only models - observations also indicate over 90% of the increased energy is in the ocean. [John Church, Australia]	this refers to page 12 line 6 and has been adjusted accordingly
33443	4	11	6	11	7	Redundant phrasing: "an increase in the rate" = "accelerating" [Government of United States of America, United States of America]	removed
19715	4	11	8	11	8	Suggestion to add the reference Chambers et al., 2018 (10.1007/s10712-016-9381-3). [APECS Group Review, Germany]	removed
2721	4	11	10	11	18	The IMBIE team (Cazenave, 2018) combined satellite data of Antarctica's changing volume, flow and gravitational attraction, and modelling of its surface mass balance to show that Antarctica had lost 2,720 ± 1,390 billion tonnes of ice between 1992 and 2017, which corresponds to a mean sea level rise of 7.6 ± 3.9 mm. Cazenave et a., 2018, Global sea level budget 1993-present, Earth System Science Data, 10(3), http://doi.org/10.5194/essd-10-1551-2018 [Thian Yew Gan, Canada]	Results from IMBIE2 are well represented in SROCC.
1675	4	11	10	11	41	What is the sea-level equivalent of the ice stored on Greenland and Antarctica? This number would be useful for comparison with the next section on glaciers. [Nora Richter, United States of America]	The Chapter Team agrees. This is a highlight of figure 4.2.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26101	4	11	10	13	12	This is very well written, however, how much textbook like material explaining basic concepts should this report. I think these concepts are important but perhaps this can be shortened and also put into a chapter box, so that it is clearer that this is the background info for readers not familiar with the basics rather than new assessment findings. Overall there is lots of repetition regarding ice sheet/glacier info between chapters. How ice sheets/glaciesr work is explained with varying detail in 4 of the 6 chapters ! [Regine Hock, United States of America]	The Chapter Team agrees. A cross chapter box in Chapter 3 addresses some of the overlap issue. This section is substantially shortened in Chapter 4.
19717	4	11	12	11	12	I think not just the fresh water in the cryosphere, but also the entire planet. [APECS Group Review, Germany]	Agreed. This has been changed.
26975	4	11	12	11	12	Previous IPCC reports call the ice sheets of Greenland and Antarctica just "ice sheets". "Ice sheet" is in the AR5 glossary with that meaning, for instance. I recommend you omit "polar". I don't think it helps. There are no other ice sheets, and Greenland isn't on the pole anyway. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	The Chapter Team agrees. This has been changed.
30001	4	11	12	11	41	A lot of the information given here is already explained in more detail in chapter 3.3.1.3 - please put it in context. If you refer to the corresponding section in chapter 3, the section here could be shortened substantially. [Ronja Reese, Germany]	This section has been shortned.
19719	4	11	13	11	13	"...cause changes in sea level." Please change sea level to GMSL. [APECS Group Review, Germany]	GMSL is used more consistently througout. However, ice sheet mass changes affect both local relative sea level (GIA, self-gravitation, etc.) as well as GMSL, so the more generic "sea level" is more appropriate here.
22053	4	11	13	11	13	"potential to cause changes" in global mean sea level not "sea level" see comment 10. Such upper limits are not really informative, as Antarctica will not fully melt. Besides, this is difficult to compare with an upper limit for thermal expansion. I doubt that such numbers are useful . [Julia Pfeffer, Australia]	The Chapter Team thinks some context on total magnitudes is useful.
27443	4	11	14	0		"The total mass ..." This statement is not true, at least for Antarctica. Ocean processes play a large role. [Matthias Mengel, Germany]	Agreed. This has been changed.
30003	4	11	14	11	16	Please reformulate, since the total mass of an ice sheet is controlled by more processes than SMB. [Ronja Reese, Germany]	Agreed. This has been changed.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33445	4	11	14	11	16	"The total mass of an ice sheet is controlled by the surface mass balance …". Strictly speaking, this is not true (this is only true for an ice sheet with no direct discharge to the ocean and there are currently no ice sheets on the earth that fit this description). It is the surface mass balance less the direct discharge to the ocean (via calving and/or submarine melting). While these processes are mentioned in the next sentences, this sentence on its own is incorrect and could lead to confusion. [Government of United States of America, United States of America]	Agreed. This has been changed.
19721	4	11	15	11	17	The SMB is the sum of accummulation - ablation, but the total mass of ice sheet is not controlled by just SMB. It is important to make this clear in the text. I think the better way to write this is: "The mass of an ice sheet is affected by the surface mass balance (SMB)--the sum of accumulation and ablation. Apart from factors like blowing wind, melt-off and evaporation, ice sheets also lose mass through the contact with warm ocean water below the ice shelves, and ice-calving." Also, insert the SMB equation? [APECS Group Review, Germany]	Agreed. This has been changed.
19709	4	11	16	11	16	Suggestion to replace: “controlled” with “driven”. [APECS Group Review, Germany]	Agreed. This text has been changed.
30005	4	11	16	11	17	The current formulation misses calving at the front of ice shelves. [Ronja Reese, Germany]	Agreed. This text has been changed.
26105	4	11	16	11	18	Two mass loss components are mentioned in L17-18 but they don't use same terminology as when the 3 components are explained in L14-16, so this is confusing for a reader not so familiar with this field. Since the 3 mass loss components are mentioned one does not need to repeat and just say: "Chanages in total ice mass will lead to a dynamical ….of the ice sheet" [Regine Hock, United States of America]	It's mainly ice-shelf loss that causes dynamical changes on IPCC timescales.
26103	4	11	17	11	17	perhaps better: "breaking off icebergs' rather than 'iceberg discharge', (discharge may be misleading) [Regine Hock, United States of America]	Agreed. This has been changed.
19723	4	11	17	11	18	The last sentence starting from "Changes in the SMB…..of the ice sheet" can be removed. [APECS Group Review, Germany]	Agreed. This sentence hass been deleted.
16529	4	11	20	11	21	It might be worth rewording the following "ice above flotation, which is the ice thickness above local sea level, corrected for the density difference between water and ice." The correction involves more than just density because the level of floatation depends upon the elevation of the sea floor as well. Maybe "ice above floatation, defined as the amount by which the ice thickness exceeds the smallest thickness that would remain in contact with the sea floor at hydrostatic equilibrium", or some other rewording. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	The local bathymetry is indeed important. This has been reworded.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26977	4	11	20	11	21	The phrase "above flotation" is jargon of cryospheric science, I would say. Could you say "land ice which is displacing sea water"? [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	A revised definition is provided, in part based on other comments.
2543	4	11	22	11	22	loosing -> losing; also p. 12, l. 36 [Michiel Van den Broeke, Netherlands]	Typo is fixed.
27445	4	11	23	0		The comparison between Greenland and Antarctica is not informative without absolute numbers. [Matthias Mengel, Germany]	Numbers are provided in Table 4.1. The main point here is that the rate is currently faster for Greenland, but that might change in the future.
16531	4	11	26	11	26	Check reference to Cross-Chapter Box 3 [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. This should be Chapter 3.
2545	4	11	26	11	27	Ice shelves, the floating extensions of glacial ice flowing into the ocean (Figure 4.2) do not directly contribute to sea level, -> When ice shelves, the floating extensions of the grounded ice sheet, melt, this does not contribute to sea level [Michiel Van den Broeke, Netherlands]	The author team prefers the original wording in this case.
10309	4	11	27	11	27	glacial ice flowing into the ocean (Figure 4.2) do not directly contribute How certain abou this ? [Mahmood Riyaz, Maldives]	The ice shelves are floating. Nonetheless thay are important to sea level because of their role in slowing the seaward flow of gounded ice (that can cause sea level rise) to the ocean.
27447	4	11	28	0		Include Reese et al., Nature Climate Change 8, 53-57, 2018. [Matthias Mengel, Germany]	Good suggestion. This citation has been added.
33447	4	11	29	11	30	Note that ice shelves can -- and do -- gain mass through submarine freeze-on (the opposite process to submarine melting). [Government of United States of America, United States of America]	Agreed. This has been reworded.
19725	4	11	29	11	37	This section should be placed higher up, line 17-18 or 21-22 of page 4-11. [APECS Group Review, Germany]	This section has been shortened, but the general flow remains unchanged.
2547	4	11	30	11	30	precipitation -> surface accumulation and basal ice accretion [Michiel Van den Broeke, Netherlands]	Agreed. Basal accretion has been added.
2549	4	11	30	11	30	Many inaccuraccies here. Melt -> meltwater runoff; substantial -> nonzero [Michiel Van den Broeke, Netherlands]	Ice shelf mass loss from runoff is not zero, but remains poorly quantified. Wording has been changed to acknowledge the process.
3629	4	11	32	11	34	One of missing references here is Hillenbrand et al. (2017, Nature). In this paper, it is shown from glaciological and oceanographic observations that warm seawater incursions onto the West Antarctic continental shelf cause melting of the undersides of floating ice shelves. It was indicated from their samples that enhanced upwelling, controlled by the latitudinal position of the Southern Hemisphere westerly winds, forced deglaciation of this sector from at least 10,400 years ago until 7,500 years ago—when an ice-shelf collapse may have caused rapid ice-sheet thinning further upstream—and since the 1940s, increasing confidence in the predictive capability of current ice-sheet models. [Nam SungHyun, Republic of Korea]	Agreed. This reference provides suitable paleo evidence of ocean-driven retreat.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21687	4	11	32	11	34	One of missing references here is Hillenbrand et al. (2017, Nature). In this paper, it is shown from glaciological and oceanographic observations that warm seawater incursions onto the West Antarctic continental shelf cause melting of the undersides of floating ice shelves. It was indicated from their samples that enhanced upwelling, controlled by the latitudinal position of the Southern Hemisphere westerly winds, forced deglaciation of this sector from at least 10,400 years ago until 7,500 years ago—when an ice-shelf collapse may have caused rapid ice-sheet thinning further upstream—and since the 1940s, increasing confidence in the predictive capability of current ice-sheet models. [Government of Republic of Korea, Republic of Korea]	Same as above.
30007	4	11	33	11	33	Please make sure that it becomes clear here that it's the changes in sub-shelf melting that drive ice-shelf thinning. [Ronja Reese, Germany]	This is clearly stated.
6135	4	11	39	0		Sometimes AR reports are refered to with "the" and sometimes not; needs to be consistently applied across report [Nina Hunter, South Africa]	This will be made consistent during final editing.
24481	4	11	39	11	41	I think both references shouldbe to CCB4, I did not find any mentioning of Antarctica in CCB3. [Eef van Dongen, Switzerland]	Agreed. This is a typo.
31185	4	11	39	11	41	Wrong cross-references. Please currect also the further references to the Cross-chapter box 5 (Southern Ocean Circulation: Drivers, Changes and Implications) and 6 (Future Sea Level Changes from Marine Ice Sheets) in Chapter 3 [Hans-Otto Poertner and WGII TSU, Germany]	Fixed.
26107	4	11	40	11	40	the 'potential' contribution is not deeply uncertain (in fact quite well known). You mean the 'actual' contribution. Perhaps just remove 'potential'. [Regine Hock, United States of America]	Agreed. This has been reworded.
15125	4	11	41	11	41	Define "long time scales", i.e. beyond the next century? [Sofie Schöld, Sweden]	Agreed. Good suggestion
16533	4	11	41	11	41	Similarly, check references to Cross Chapter boxes throughout. I noticed several inconsistencies. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	This has been fixed.
19727	4	11	41	11	41	"This is .....in Chapter 1) can be removed. [APECS Group Review, Germany]	Agreed.
19729	4	11	41	11	41	"on long time scales" . Long is a very subjective word. Perhaps the proper word to use is "decadal or centinnial time scales". [APECS Group Review, Germany]	Changed. See comment above.
19731	4	11	41	11	41	Consider adding the results and the reference of Pattyn et al., 2018 (https://doi.org/10.1038/s41558-018-0305-8). [APECS Group Review, Germany]	Pattyn 2018 is referenced elsewhere.
30009	4	11	41	11	41	Reference to Cross-Chapter Box 3, Chapter 1 seems wrong? [Ronja Reese, Germany]	Agreed.. This has been fixed.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
580	4	11	43	0		The comparison between glaciers and the Antarctic and Greenland ice sheets is excellent, but given this higher rates but less mass, is it possible to include what the projected contribution is? How dose this percentage change over time? [Jenna Pearson, United States of America]	taken into account - there is a new cross-chapter-box on glacier mass change projections that covers this issue
19745	4	11	43	11	57	Do you include Antarctica & Greenland peripheral glaciers ? [APECS Group Review, Germany]	taken into account - peripheral glaciers are included; Table 4.1 explicitly mentions their contribution. The more detailed discussion of polar glaciers (including peripheral) rests in Chapter 3.
2723	4	11	45	11	56	The mean contribution of glaciers to SLR for 1993-2016 is 0.65 ± 0.051mmyr-1 and 0.74 ± 0.18mmyr-1 for 2005-2016. Without complete observed dataset for glacier mass changes, most methods in deriving glacier sea-level contribution must extend local observations to a larger region. [Thian Yew Gan, Canada]	taken into account - the quantitative discussion of the glacier mass contribution to the ocean is found in Sect. 4.2.2.3.3
16499	4	11	45	11	56	It is suggested to cross-check with Ch 2.2.3, particularly on the general signal of glacier change (different references for the same argument). [Georg Kaser, Austria]	taken into account - the paragraph has been shortened, pointing to the corresponding sections in Ch 2 and 3 instead of repeating the argument
19733	4	11	46	11	46	"mainly snowfall".... not just snowfall. Rain sometimes fall at the Rothera Station in Antarctic Peninsula. The more suitable word to use is "precipitation". [APECS Group Review, Germany]	taken into account - the sentence has been deleted
19735	4	11	47	11	49	Proposed changes: "Due to their relatively high accumulation and ablation rates, these ice sheets are sensitive indicators that can respond quickly (in the order of decades) to changes in the climate system." [APECS Group Review, Germany]	rejected - the point here is to distinguish the fast response of glaciers from the slower of ice sheets. Because of the high accumulation and ablation rates, the glaciers (not the ice sheets) respond fast.
9235	4	11	48	11	49	The pioneering work by Johannesson on defining glacier response time and linking this to glacier thickness and (frontal) mass balance could definitely be acknowledged here, but is likely not the best reference to the response time scale of glacier being in the order of decades. Other references that could be considered here are the work by Adhikari and Marshall (2013, The Cryosphere) and by Christian et al. (2018), who nicely show the decadal time scale response of glaciers [Harry Zekollari, Switzerland]	taken into account - we agree with the reviewer, but the reference to response time scales was deleted for brevity and to avoid duplication of the more detailed discussion of glaciers in Ch 2 and Ch 3).
28393	4	11	48	11	50	This is an often quoted statement (I have done it myself) but as phrased is incorrect. See comment 22 above. The reason GIC were the major contributor during the 20th C was their response to the end of the LIA, which was more pronounced than that from the GrIS...See e.g. Marzeion 2015 [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	taken into account - the reference to response times scales was deleted (while it is true that for most glaciers the response time scale is of the order of decades, the glaciers that contribute significantly to sea-level rise are the largest ones, which often have considerably longer response time scales).
19737	4	11	50	11	50	"than the Greenland and Antarctic ice sheets" combined ? This sentence can be ambiguous so please clarify, or change the way you write the sentence. [APECS Group Review, Germany]	accepted - yes, more than the ice sheets combined; text was edited to reflect this

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2149	4	11	50	11	51	See also Parkes and Marzeion 2018 (doi:10.1038/s41586-018-0687-9) [Robert Kopp, United States of America]	taken into account - we added a reference to Parkes and Marzeion (2018) when discussing the sea-level budget and climate models' ability to reproduce observed sea-level change.
9603	4	11	50	11	51	This is the first time the acronym EG has been used in this chapter so it should be spelled out. [Government of France, France]	accepted - EG was a typo and has been deleted.
15127	4	11	50	11	51	Have glaciers added more mass to the ocean than the Greenland and Antarctic ice sheets combined or respectively? Also, I don't understand the meaning of "EG" at the end of the scentence. [Sofie Schöld, Sweden]	accepted - EG was a typo and has been deleted, the sentence has been editied to clarify they added more mass than both ice sheets combined.
19739	4	11	51	11	51	Checked "Gregory et al. 2013", it talks about climate models without preindustrial volcanic forcing that underestimate historical ocean thermal expansion. Nowhere in the text talks about the term "glacier", no "ice-sheets", no "mass", no "greenland", and no "antarctica". Is this a wrong reference? The rigth reference should perhaps be Gregory, J. M., White, N. J., Church, J. A., Bierkens, M. F. P., Box, J. E., Van den Broeke, M. R., Cogley, J. G., Fettweis, X., Hanna, E., Huybrechts, P., Konikow, L. F., Leclercq, P. W., Marzeion, B., Oerlemans, J., Tamisiea, M. E., Wada, Y., Wake, L. M. and Van de Wal, R. S. W. (2013) Twentieth-century global-mean sea-level rise: is the whole greater than the sum of the parts? Journal of Climate, 26 (13). pp. 4476-4499. ISSN 1520-0442. [APECS Group Review, Germany]	accepted - the correct reference has been inserted
19741	4	11	51	11	51	What does EG mean? [APECS Group Review, Germany]	accepted - EG was a typo and has been deleted.
28247	4	11	51	11	51	What is EG? [Martin Truffer, United States of America]	accepted - EG was a typo and has been deleted.
9237	4	11	51	11	53	For the ice volume of all glaciers, it would be good to include the newest global numbers from Farinotti et al. (accepted, Nature Geoscience), to which several groups have contributed as a part of the G2TI effort (http://people.ee.ethz.ch/~danielfa/IACS/G2TI.html) [Harry Zekollari, Switzerland]	accepted - the number has been updated and the reference added
19711	4	11	51	11	53	Suggestion to make the text shorter: “However, the volume of ice stored in glaciers is small by comparison, equivalent to only between 0.31 and 0.53m mean sea level rise if all the world’s glaciers were lost (Vaughan et al., 2013).” [APECS Group Review, Germany]	accepted - sentence was changed to "However, the mass of glaciers is small by comparison, equivalent to only …"

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19743	4	11	51	11	57	The uncertainties of the world glacier ice are probably much larger (see Rabatel et al., 2018, https://www.frontiersin.org/articles/10.3389/feart.2018.00112/full and Maussion et al., 2018, https://doi.org/10.5194/gmd-2018-9 and Huss and Farinotti, 2012, https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2012JF002523). See also ITMIX intercomparison of glacier ice thickness estimates. [APECS Group Review, Germany]	taken into account - the number (and uncertainty) was updated by the new consensus estimate of Farinotti et al. (2019)
25269	4	11	54	11	54	Bjørk et al, Nat Cli Cha 2018, found different glacier response to temp and precip in east and west greenland during the 20th century. Doi: 10.1038/s41558-017-0029-1 [Kristian K. Kjeldsen, Denmark]	rejected - too detailed for the scope of this section (and this chapter), polar glaciers are covered in more detail in Ch 3.
30203	4	12	1	12	1	The title of this subsection is mis-leading, why not linking to steric change? Moreover, the overall titel of this section 4.2.1 is process of sea level change and 'processes of sea level rise" - consequently halosteric effects should be included in the discussion for the subsection 4.2.1.3 [Karina von Schuckmann, France]	We agree that it is mainly about thermal expansion but it touches upon the dynamics and the effect of salinity in the last sentence, so we maintained the title of the section. The title of 4.2.1 is also not changed as it is not only about rise.
19751	4	12	1	12	13	Is salinity changes only regional ? Because you mention the effect of salinity changes only for regional sea level changes. [APECS Group Review, Germany]	Yes the effect of salinity changes is only important on regional scales
16535	4	12	3	12	3	The warmer the ocean water, the lower its density and therefore the larger its volume per unit of mass 3 ("thermal expansion"). Not sure this is universally true, e.g. very low temperatures. Might be worth adding some sort of clarifier. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	rephrased
19753	4	12	3	12	4	It may be appropriate to put a reference for this sentence to enlighten the average layperson. [APECS Group Review, Germany]	we consider it to be sufficient if we explain it like we do.
19747	4	12	3	12	6	Kopp et al., 2016 talks more about relating temperature and global sea level variability, rather than couple, a suggestion is: "The warmer the ocean water, the lower its density and therefore the larger its volume per unit of mass ("thermal expansion"). Thus, warming leads to a higher sea level even when the ocean mass remains constant. Over at least the last 1500 years changes in sea level were related to global mean temperatures (Kopp et al., 2016), partly because of ice mass loss, and partly because of thermal expansion." [APECS Group Review, Germany]	changed accordingly
4691	4	12	4	0		Explain 'thermal expansion' at first mention on pg 10. [Debra Roberts and Durban Team, South Africa]	text on page 10 has been rewritten

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26995	4	12	4	12	4	Gregory et al. (terminology paper) recommend using the phrase "global mean thermosteric sea level change" for the contribution of thermal expansion to GMSLR. The phrase "thermal expansion" by itself is convenient jargon, but it's really the name of the process, not the effect. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	rephrased
19755	4	12	5	12	6	(Kopp et al 2016), for this sentence, Kopp et al. 2016 actually cited Gregory et al. 2013. Twentieth-century global-mean sea level rise: Is the whole greater than the sum of the parts? J Clim 26(13):4476 –4499.. Are we not supposed to cite the original reference when writing paper? [APECS Group Review, Germany]	We refer to Kopp because it covers a longer time scale than the Gregeory et al. 2013 paper
30189	4	12	6	12	7	The fact that more than 90% of excess heat in the Earth system is stored in the oceans has been not derived by models only. This should be also referenced, at least AR5. [Karina von Schuckmann, France]	corrected
10311	4	12	7	12	7	more than 90% of the increase (where is the reference?) [Mahmood Riyaz, Maldives]	the reference is Church et al. 2013 which is used after the next sentence referring to both sentences
26979	4	12	7	12	7	Please give a reference for the "more than 90%". [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	see previous comment
13933	4	12	9	12	10	It is unclear what the two consistent viewpoints refer to, please clarify or remove this sentence. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	point has been clarified
19757	4	12	9	12	10	Which two viewpoints? I'd suggest the author to re-write the viewpoints in list-form: (a) the sun and the moon and the stars ; (b) the earth and the sky and the sea. [APECS Group Review, Germany]	see previous comment
4693	4	12	10	12	11	Is it possible to replace "coefficient" with "the level of thermal expansion" for clarity? Is "different" in line 11 "higher" or "lower"? Line 12: "regional change" in what? SLR? Relative sea level? [Debra Roberts and Durban Team, South Africa]	we have taken the suggestion into account
22055	4	12	10	12	12	Thermal expansion is non-linear (a.k.a. warm water expand more than cold water for the same temperature increase), but this process is small compared to the transport (in particular advection) of heat by wind stress and ocean currents. Reference: Forget, G., & Ponte, R. M. (2015). The partition of regional sea level variability. Progress in Oceanography, 137, 173-195. [Julia Pfeffer, Australia]	we have modified the last sentence to accommodate this point
30191	4	12	11	12	13	There are much more recent papers which should be assessed here, including from members of the chapter LA team. Moreover, information should be delivered on the dominant role of thermal expansion for regional sea level rates, which is not clearly stated in this subsection. [Karina von Schuckmann, France]	Only the last sentence discusses ocean dynamics and salinity so there is already a strong emphasis on the thermal expansion. Here we just discuss processes the real numbers follow later.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26985	4	12	12	12	12	This isn't quite right, I think. The pattern of ocean dynamic sea level change is caused by the distribution of change in temperature and salinity - neither of them is uniform, and the former is more important. Mostly the change in circulation is in balance with this, though there is also a smaller part (maybe a 10% effect) due to the wind-driven change in circulation. The ocean dynamic change in sea level (the term recommend by the terminology paper of Gregory et al) i.e. thermosteric and halosteric is not "geodynamic" so it doesn't belong in this section. It could be in 4.2.1.3. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we removed ocean dynamics
26981	4	12	13	12	13	There are more recent references for this e.g. Bouttes et al. 2014 10.1007/s00382-013-1973-8 and probably later ones I can't think of just now. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we have added two more recent papers
15129	4	12	17	12	19	Elaborate on how withdrawal of groundwater and storage of fresh water affects GMSL. Give a few examples on how it can cause sea level to rise or fall. [Sofie Schöld, Sweden]	unclear what the reviewer means storage on land is equivalent to sea level fall, terrestrial water depletion is sea level rise? Text has been clarified
4697	4	12	17	12	24	"affected by" - wherever possible, please could you be specific about the direction of a change. For example here, do reservoirs and ground water withdrawal, or land water depletion, increase or decrease sea level? [Debra Roberts and Durban Team, South Africa]	has been added
4695	4	12	18	12	19	Delete "...contributes to GMSL" as the paragraph started by saying this. Connect the sentences with comma. [Debra Roberts and Durban Team, South Africa]	rephrased
22001	4	12	18	12	19	Dam construction might contribute to CHANGE in GMSL but not to GMSL itself [David Schoeman, Australia]	correct sentence rephrased
19759	4	12	19	12	21	Proposed reformulation: "During the early 20th century the terrestrial contribution came mainly from storage of water. In recent decades, however, land water depletion due to domestic, agricultural and industrial consumption has become more apparent." [APECS Group Review, Germany]	rephrased
26983	4	12	21	12	21	Please insert reference for the recent dominance of land water depletion. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	done
19767	4	12	22	12	24	A short description of El Nino Southern Oscillation would make it more comprehensible. What is the impact? Or better is to link to an other part of the report or other reports. [APECS Group Review, Germany]	here the relevance is the change in precipitation and water storage on land as explained in the sentence as this effects sea level
11437	4	12	28	12	31	Irrelevant to the subsection [Anson Cheung, United States of America]	This section has been reorganized and shortened.
30193	4	12	28	12	31	This short paragraph would draw in on the previous comment (for subsection 4.2.1.3), displaced here. Moreover, the last sentence of this paragraph is repetition (L29-31 compared to L11-13) [Karina von Schuckmann, France]	Agreed. See above.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19749	4	12	30	12	30	Change " and trends in atmospheric pressure" to "and atmospheric circulation"? Surface wind patterm changes also matters as shown in line 22-24 of papge 25, right? [APECS Group Review, Germany]	Agreed. This section has been reorganized to avoid repetition.
19761	4	12	33	12	34	This has already been defined on page 4-10, line 15. [APECS Group Review, Germany]	Agreed see above.
22057	4	12	33	12	35	Repettion of the definition of fingerprnts (already given p10 L15 to 19) [Julia Pfeffer, Australia]	Agreed. This section has been improved to reduce repetition.
582	4	12	33	12	37	Perhaps a bit more discussion on why the effects of gravity and rotation are felt far away from the gravity anomaly could be included, as the GIA section is nicely detailed and perhaps a bit more intuitive than the gravity-rotation response. [Jenna Pearson, United States of America]	An attempt has been made to clarify, but within our tight space constraints.
4015	4	12	33	12	37	this part may need to rewrite to avoid explain in more precise way that when the sea level will be rised or declined due to the Earth's gravity and rotation. So that non-geologists can have a clearer picture on the process. [Lim Lee-Sim, Malaysia]	See comment above.
26987	4	12	33	12	46	This paragraph is disproportionately long. These effects are at the moment less important than the ocean dynamic sea level change, and by the end of the century they are of comparable importance, but this paragraph is many times longer than the single sentence dealing with ocean dynamic sea level. Also, you've already summarised it in the preamble of Sect 4.2. The combined effect of changes in gravity, rotation and deformation are referred to as "GRD" by the terminology paper of Gregory et al. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	This paragraph has been condensed.
4699	4	12	35	0		"Proximal to", replace with "when an ice sheet loses mass" for simplicity. [Debra Roberts and Durban Team, South Africa]	Agreed. Simplified.
19763	4	12	35	12	35	I don't understand this sentence. Why use the term proximal? [APECS Group Review, Germany]	Agreed see above.
2151	4	12	35	12	36	"losing", not "loosing" [Robert Kopp, United States of America]	Typo has been fixed.
10313	4	12	41	12	41	glacio-isostatic adjustment (GIA) is causing uplift and a lowering of relative How much?? What is the rate?? [Mahmood Riyaz, Maldives]	Rates of GIA vertical land motion vary- generally on the order of mm/yr but can be higher.
4701	4	12	42	12	43	"In other locations, proximal to the previous ice load...." sentence is not easy to understand. Perhaps give a simple explanation that the earth's crust is elastic, and that a redistribution of ice or water load anywhere, can cause vertical land motion even far away and over long time periods. [Debra Roberts and Durban Team, South Africa]	Agreed. This section has been reorganized for simplification.
22059	4	12	46	12	46	"generally a few mm/yr": can be larger than a cm/yr in regions of former ice-caps [Julia Pfeffer, Australia]	Agreed. See comment above.
13935	4	12	48	12	51	It would be helpful if this section could note why tectonics and dynamic topography are generally not considered in projections of sea level change on decadal to century timescales. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	This is now mentioned.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26989	4	12	48	12	51	This para also seems rather long in relation to its relevance i.e. it is not relevant to this report, as the second sentence says. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	This has been reorganized, but the content remains for completeness.
2153	4	12	50	12	51	Average rates of contributions from these terms, assessed based on tide gauges, are included in some widely used projections (e.g., Kopp et al, 2014). [Robert Kopp, United States of America]	Agreed. This sentence has been changed.
2993	4	12	50	12	51	The authors rightly note that vertical ground motions besides GIA (e.g., tectonics, volcanism, natural or anthropogenic changes in ground water content of coastal sedimentary layers…) are indeed often the least known component in future sea level changes, but the sentence suggests it is usually ignored, whereas it is rather assessed locally (e.g., Ballu et al. 2010, Wöppelmann et al 2013, among many others); Ballu, V., et al. (2011). Comparing the role of absolute sea-level rise and vertical tectonic motions in coastal flooding, Torres Islands (Vanuatu). Proceedings of the National Academy of Sciences, 108(32), 13019-13022.; Wöppelmann, G., et al. (2013). Is land subsidence increasing the exposure to sea level rise in Alexandria, Egypt?. Geophysical Research Letters, 40(12), 2953-2957. I suggest to rephrase: "However, vertical ground motions due to tectonics and other processes are generally considered only in local projections of sea-level change on decadal-to-century timescales." [Goneri Le Cozannet, France]	Agreed, see above.
17669	4	12	50	12	51	I think the remark around tectonics needs a further statement to say "...despite tectonic or anthropogenic effects being dominant in many regions" [Matt King, Australia]	Agreed, see above.
19765	4	12	51	12	51	" decadal-to-century timescales. " I believe the proper way to write this is decadal-to-centennial. [APECS Group Review, Germany]	Agreed. This has been chenged.
26991	4	12	53	12	53	See earlier comment (on page 6 line 4) recommending against using the phrase "Sea level extremes". [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	Changed to "Extreme sea-level events".
2995	4	12	55	12	55	Please note that the wave runup is defined as the altitude reached by the swash (and not the sum of the swash and setup) (see e.g., http://www.coastalwiki.org/wiki/Run-up or USACE reports) [Goneri Le Cozannet, France]	wave run up is abanonded
6139	4	12	55	12	56	This sentence does not make sense. "Superposed on ….can be important locally." Please explain. [Nina Hunter, South Africa]	rephrased
10315	4	12	55	13	4	Coral reef capacity to reduce the wave height or absorb wave energy been factored here?? [Mahmood Riyaz, Maldives]	it is here just to stress that there is more than gradual changes

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
23191	4	13	0	13		What is the level of scientific understanding ? What are the timescales of responses? Intertia / irreversibility? This figure could convey more than an schematic illustration. Missing cliffs? [Valerie Masson-Delmotte, France]	
32619	4	13	0	13		the red coloring alongside the "steric warming" label is confusing. surface warming is not confined to the coast, which is what is depicted here. Perhaps a slight red wash, or stippled red dots, across the surface of the cross-section would be more accurate? Elsewise the red colroing could be removed completely wtihout any loss to the key messages. [Kim Cobb, United States of America]	we agree with the reviewer and changed the figure
11083	4	13	0	14		The description of the Mid Pliocene Warm Period in terms of literature is detailed, more on the modeling side than in the data-side, maybe too much considering that the conclusion is that there is low confidence in our knowledge to use this as a reference for the future. [Valentina R. Barletta, Denmark]	the section has been removed to the appendix
15595	4	13	0	14		The description of the Mid Pliocene Warm Period in terms of literature is detailed, more on the modeling side than in the data-side, maybe too much considering that the conclusion is that there is low confidence in our knowledge to use this as a reference for the future. [EUCE, Belgium]	see previous comment
19777	4	13	1	31	1	From page 13 onward, the reference style has change significantly. Prior to page 13, references are put behind a sentence. From page 13 onward, some references are used as the beginning of a sentence. This phenomenon has occurred throughout the pages. Please standardize the reference style. [APECS Group Review, Germany]	There is no need to have this always identical
11569	4	13	2	13	2	The wind field also generates the waves, not only the storm surge [Luca Castrucci, United States of America]	corrected accordingly
21811	4	13	6	0		Fig 4.2 - Extreme Sea Level inset on schematic also needs to include the SL anomaly or SLA (monthly to interannual) from climate variability (e.g. storminess, seasonal cycle, ENSO, NAO) - as MSL is generally the average SL over longer periods of years. In regions of world where storm surge is limited (i.e. no TCs, hurricanes etc), SLA can be an significant contributor, particularly in the Pacific Islands out of the TC zone. [Robert Bell, New Zealand]	text has been rephrased to clarify this

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2997	4	13	6	13	6	The figure is good, but there are several details that could be reconsidered: first, the green and red arrows can be discussed for subsidence and for the box on extreme sea levels because subsidence can be very local (i.e., O(100m)) (see e.g. any InSAR results in a coastal city) and because storm surges and even wave setup can have a regional footprint (i.e., O(10km) depending on the local bathymetry); Hence I wonder if the color can be given for arrows in these cases; Second, the swash, the surge and the wave setup should be associated to ranges and not altitudes (see runup, waves setup and surge definitions), and the wave setup should start beyond the waves breaking point; third, the surges are superimposed to the high tide in the figure (which high tide: spring tide, neap tide?), but it could be preferably added to the predicted tide; fourth: rather than subsidence, I suggest mentionning vertical ground motions (some areas are uplifting, some are affected by non linear vertical ground motions, as shown for example in the SONEL database). [Goneri Le Cozannet, France]	the figure has been improved, thanks for the advise
17673	4	13	6	13	6	Figure is missing effects of earthquakes which can be of either sign and large [Matt King, Australia]	we don't consider earth quakes in this chapter
2313	4	13	6	13	7	Figure 4.2, 'High Tide' is shown, It is better to show as "Tidal height" , as like high tide, low tide is also a possibility [Unnikrishnan Alakkat, India]	The figure has been improved, thanks for the advise
19779	4	13	6	13	8	The colours black and grey are indistinguishable. [APECS Group Review, Germany]	The figure has been improved, thanks for the advise
19781	4	13	6	13	8	What is the meaning of the colours pink and purple? If the colours don't have a meaning, leave it in a neutral colour to avoid confusion. [APECS Group Review, Germany]	The figure has been improved, thanks for the advise
22061	4	13	6	13	9	Figure 4.2 : Numbers provided for ice storage as SLE are not relevant for climate change (comment 11). Comparatively, thermal expansion would provide about 5m of SLE per degree of ocean warming (considering a uniform warming over the full depth of the ocean). Such numbers, which are not relevant to assess the impacts of climate change, are likely to be misused. [Julia Pfeffer, Australia]	They are relevant because Antarctic can cause a large contribution on long time scales
30195	4	13	6	13	9	Not correct to use the thermonilogy "steric expansion" - not only expansion is taking place. For example "steric change" whould be much more reliable. [Karina von Schuckmann, France]	we decided to leave it as it is
10497	4	13	6	13	12	I don't see that the words "cyclonic/anticyclonic" add much. Just say "winds". [James Renwick, New Zealand]	we did accordingly

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13937	4	13	6	13	12	The figure seems very busy. The perspective of the islands seems as though they are underwater, the colours could be improved to avoid this. In addition the small box on the extreme sea levels is unclear with regard to the lines and whether this is just showing a definition of terms. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	we improved the figure
2435	4	13	7	13	7	Related to the comment above, it would be good if the figure could reflect how freshwater inflow during extreme events can be an important component of the resulting extreme water levels, especially in estuaries and deltas. [Thomas Wahl, United States of America]	we omitted that it is also not discussed in the chapter
584	4	13	7	13	12	Perhaps it could be useful to include a color legend in the open space of the crust. [Jenna Pearson, United States of America]	we used that space to clarify aspects of the figure
3187	4	13	7	13	12	This is a helpful schematic, but the labeling and caption are somewhat unclear. Specifically, the caption addresses the significance of the red and green colored words, but doesn't explain the meaning of the purple, blue or black words. [Sloane Garelick, United States of America]	we imporoved the figure
3955	4	13	9	13	12	What does the magenta color represent is not clear from the captions. [Aakash Sane, United States of America]	we improved and changed the figure
10847	4	13	9	13	12	In the figure text, include references to the three values of SLE. Colors of process illustrations on Antarctica appear to be purple, explanation for this is lacking in text. [Ola Kalén, Sweden]	we improved the colors and the legend
11439	4	13	9	13	12	Explanation for purple color and blue color labels missing. [Anson Cheung, United States of America]	we improved the legend
23731	4	13	9	13	12	Colors of process illustrations on Antarctica appear to be purple, explanation for this should be included in the caption. [Government of Sweden, Sweden]	we improved the legend
33449	4	13	9	13	12	Hydrological cycle arrow could use variable color from white to light blue. It is somewhat obscured in the figure and this is true in general for many of the arrows, which could probably benefit from being lighter and or different line widths. [Government of United States of America, United States of America]	we improved the legend
4017	4	13	10	13	10	Double check if the major ice processes of Figure 4.2 shows in grey or purple. Because from the document I am reading here it should be in purple colour. [Lim Lee-Sim, Malaysia]	we improved the legend
17243	4	13	10	13	10	Major ice processes are shown in purple, not grey, I believe [Andra Garner, United States of America]	yes corrected
2725	4	13	15	13	23	The global mean SLR is estimated at 3.1 ± 0.3 mm yr−1 and acceleration of 0.1 mm yr−2 over 1993 (Legeais et al., 2018; Nerem et al., 2018). Ocean thermal expansion, glaciers, Greenland and Antarctica respectively contribute 42 %, 21 %, 15 % and 8 % to the global mean sea level over the 1993–present period (Cazenave et al., 2018). [Thian Yew Gan, Canada]	yes this will be discussed further in the paragraph

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2727	4	13	15	13	23	Legeais et al., 2018, An improved and homogeneous altimeter sea level record from the ESA Climate Change Initiative, Earth Syst. Sci. Data, 10, 281–301, https://doi.org/10.5194/essd-10-281-2018 [Thian Yew Gan, Canada]	the paper is used in section 4.2.2.2.2
2729	4	13	15	13	23	Nerem et al., 2018, Climate Change Driven Accelerated Sea Level Rise Detected In The Altimeter Era, Proc. Natl. Acad. Sci. USA, 115, 2022–2025, https://doi.org/10.1073/pnas.1717312115, 2018. [Thian Yew Gan, Canada]	yes this will be discussed further in the paragraph
12135	4	13	17	13	18	The authors said, "Past changes in sea level are important as they provide information on the size of the major ice sheets in climates different from today". Is there any historical example to substanitate this? Which are the major ice sheets? What happened to those major ice sheet with rising temperature or climate change? Is there any historical evidence? Please provide with proper citation. [Narendra Dalei, India]	Here it is just a general statement, further specification follows in the paragraphs belo
12137	4	13	17	13	23	Provide the figures of today's temperature and global mean temperature then compare. More clarity is needed with proper citation. [Narendra Dalei, India]	The following two pages are about this topic in so much detail that we have to remove it to the appendix due to space constraints
19769	4	13	19	13	22	The writing style should be consistent between the two sentences, a suggestion is: “These include the Mid Pliocene Warm Period (MPWP) around 3 Myrs ago, when global mean temperatures were warmer than today’s. A second period of interest is the Last Interglacial (LIG) or Eemian around 130–115 Kyr ago, when global mean temperatures were slightly higher than today’s.” [APECS Group Review, Germany]	corrected accordingly
19783	4	13	19	13	22	There is no indication of how much warmer it was. You have to read the next part to get this information. [APECS Group Review, Germany]	yes that is correct because that takes discussion to do
2155	4	13	20	13	22	I would argue that a reasonable case could be made for Last Interglacial temperatures comparable to those today (e.g., see the analysis of Hoffman et al 2017. [Robert Kopp, United States of America]	We agree with the reviewer that the temperature during LIG were probably only marginal above the present-day in the global mean sense. We therefore rephrased the sentence a bit to clarify this better.
25837	4	13	21	13	22	The text suggests, that Last Interglacial (LIG) global mean temperature was slightly higher than today, while a recent data compilation stresses that they might have been indistinguishable from the 1995-2014 mean (Hoffmann et al. (2017), Science, DOI: 10.1126/science.aai8464). In light of the (probably) strong sea level rise in the LIG this is a powerful observation and might strengthen the notion that the climate system could be close to a tipping point regarding the cryosphere. [Johannes Sutter, Germany]	we are not sure what the reviewer wants to express here. We agree that the relevance of the lig comes from the notion that temperatures were close to today's values. That is why we had the intention to have this paragraph which will be reduced due to page constraints in the final draft.
19771	4	13	22	13	22	" slightly higher than today's. " Reference missing. [APECS Group Review, Germany]	This is discussed with references later in the paragraph

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13939	4	13	22	13	23	What are the key uncertainties for the reconstructions (could a reference be provided for where this is discussed elsewhere)? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	we have added that this uncertainties are discussed in the paragraph itself
19773	4	13	24	13	24	Suggestion: It would be awesome if the author could insert an organization chart, or table at this section to summarize the the climate intervals: MPWP, LIG and deglaciation; period, characteristics, sea level. [APECS Group Review, Germany]	the whole paragraph will be replaced by a Table to safe space
11441	4	13	25	13	28	It doesn't really add anything to the discussion of paleo and modern observed sea level change. [Anson Cheung, United States of America]	removed this sentences
6141	4	13	27	0		"relative to modern" what? [Nina Hunter, South Africa]	removed this sentences
17671	4	13	32	13	32	what is Mid-Piacenzian Warm period - not used or defined. [Matt King, Australia]	This terminology has been simplified. The paleo sea level section has been reorganized and largely moved to the appendix.
12139	4	13	33	13	34	What are those several geochemical techniques? Please dscribe briefly with example. [Narendra Dalei, India]	Detials regarding these techniques are beyond the scope of assessment.
19775	4	13	35	13	35	Obrien's paper is more towards SST estimation. CO2 is more of citing other people's work. So perhaps the author needs to cite the original paper from which the CO2 work comes from. [APECS Group Review, Germany]	Agreed. This has been removed.
10849	4	13	36	13	36	Is this the first time the abbreviation ppmv is used? If so, explain it. [Ola Kalén, Sweden]	"ppmv" is now defined.
6143	4	13	38	0		Remove "degree" - already stated [Nina Hunter, South Africa]	Agreed. Removed.
2551	4	14	6	14	6	And what was the outcome of Rovere et al's (2014) questioning? [Michiel Van den Broeke, Netherlands]	This is now stated.
29089	4	14	6	14	6	In this connection of the Pliocene as analogue, might be helpful to cite here or elsewhere in this chapter the recent paper by Burke et al (2018, PNAS) that under RCP8.5, the climate globally will reach a state most closely matching that of the Eocene by 2150, after having reached the Pliocene in 2030. [Pam Pearson, Sweden]	A reference to Burke et al., 2019 has been added.
4703	4	14	8	0		What are "obliquely paced variations"? And what is δ18O? [Debra Roberts and Durban Team, South Africa]	This is now better explained.
33451	4	14	8	14	8	"During the MPWP obliquity paced variations of up to 30 m have been reconstructed …". Clarify if/that referring to sea level variations of up to 30 m here (?). Slightly ambiguous as written. [Government of United States of America, United States of America]	Yes. "sea-level" has been added.
11443	4	14	8	14	10	This sentence is awkward. There is no need to mention it if it's not related to assess current changes. [Anson Cheung, United States of America]	This sentence is improved. Orbital variability is relevant to ice sheet sentitivity, so the content remains.
1677	4	14	8	14	30	Provide more context here, i.e., was it known that West Antarctica was completely ice-free during the MPWP? [Nora Richter, United States of America]	Context relative to WAIS is provided.
19787	4	14	12	14	18	I suggest putting this entire passage as a new paragraph. [APECS Group Review, Germany]	This section has been rearranged.
6145	4	14	14	0		"above modern" what? [Nina Hunter, South Africa]	Above modern "sea level". Changed.
9159	4	14	15	14	15	WAIS: the acronym was not introduced before (West Antarctic Ice Sheet) [Angelique Melet, France]	WAIS is defined.

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19795	4	14	15	14	15	The abbreviation of WAIS is not explicited. [APECS Group Review, Germany]	See above.
10317	4	14	17	14	17	What is the diffrence betwetween the Capital and Simple k in (~3 kyr) in page 14 line 17 and 130–115 Kyr in page 13 line 21 [Mahmood Riyaz, Maldives]	Typo. Should be ka. Kyr refers to "thousand years". ka is "thousand years ago".
6147	4	14	20	0		Sentence as it stands problematic. Suggest insert comma after "13 meters" and remove "is" [Nina Hunter, South Africa]	This sentence has been rewritten.
19789	4	14	23	14	24	This part should be start a new paragraph. [APECS Group Review, Germany]	This paragraph has been rearranged.
1679	4	14	24	14	27	Based on existing studies, which ice sheet was leading vs. lagging? This could be important context for considering our present day scenario. And is it known whether both ice sheets reach a maximum contribution to sea level rise at the same time or were they completely out-of-phase? [Nora Richter, United States of America]	Paleo records do not yet have the fidelity to determine leads and lags on these timescales.
4705	4	14	26	0		What is "precessional orbital forcing"? [Debra Roberts and Durban Team, South Africa]	This is now better defined.
4707	4	14	27	0		What is "interhemispheric antiphasing" [Debra Roberts and Durban Team, South Africa]	This is now better defined.
19793	4	14	27	14	27	There is no explanation of what 'interhemispheric antiphasing of Pliocene ice volume' is. [APECS Group Review, Germany]	This is now better defined.
19791	4	14	30	14	30	Reference missing for this example. [APECS Group Review, Germany]	This is common knowledge. Elevated sea levels are from a combination of one or both ice sheets.
19785	4	14	34	14	35	Also bathymetry causes large uncertainties on ice sheet response to warm climate. [APECS Group Review, Germany]	Agreed, although Antarctic bathymetry has been close to modern since the Pliocene
23193	4	14	45	14	45	Define what is a "future analogue" [Valerie Masson-Delmotte, France]	Better defined now.
29085	4	14	46	14	46	Is it perhaps more accurate to state that there is "low confidence in the upper boundaries of SLR in the MPWP as an analogue..."? The lower bounds are fairly consistent. [Pam Pearson, Sweden]	Agreed.
25839	4	14	48	15	45	While there are multiple modelling studies cited estimating the Pliocene GIS/AIS SL contribution and the the GIS LIG SL contribution, no modelling studies explicitly adressing the LIG AIS SL contribution are mentioned. Is this intentional because there are only a few and uncertainties are high? There are at least 2 modelling (albeit standalone) studies adressing the Last Interglacial Antarctic sea level contribution, stating that the AIS contributed ca. 2.5-7.5 m (Sutter et al. (2016) GRL, https://doi.org/10.1002/2016GL067818, DeConto & Pollard (2016), Nature, https://doi.org/10.1038/nature17145) depending on model and forcing assumptions to global sea level rise therefore "closing" the sea level budget of 6-9 m (Dutton et al.) in concert with thermal expansion of the ocean, land based glaciers and Greenland. [Johannes Sutter, Germany]	Sutter et al., has been added.
6149	4	14	49	0		Suggest inserting "the" before "Eemian" [Nina Hunter, South Africa]	Not needed in this case.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29087	4	14	49	14	49	Missing the LIG temperature range, per the convention with the MPWP in the previous section (13 line 38): note LIG temperature range or peak temperatures (assume that would be 1-2 degrees above pre-industrial). [Pam Pearson, Sweden]	This is provided in the introductory section above.
27239	4	14	49	14	56	Publication by Dusterhus et al (doi: 10.1093/gji/ggw174) should be added in here which overlaps with the previous Kopp estimates but indicates a much great range of results for the modelled GMSL depending on the input models and statistical assumptions. This is in support of the conclusions to this section on page 15. [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	Great suggestion. A reference to Dusterhus has been added.
2157	4	14	50	14	50	Dutton et al 2015's assessment was "~6 to 9 m". Not sure where the 9.3 is coming from. [Robert Kopp, United States of America]	Agreed. Fixed.
6151	4	14	55	0		Change comma position from before to after "respectively" [Nina Hunter, South Africa]	"respectively" is not needed.
2553	4	14	55	15	56	The 10 m threshold comes out of the blue; surely a likely range can be provided? [Michiel Van den Broeke, Netherlands]	The 10 m value comes from AR5, which is supported by the more recent work assessed here.
6153	4	14	56	0		Suggest changing "level" to "levels" and inserting "levels" after "present" [Nina Hunter, South Africa]	Agreed. Changed.
26993	4	15	1	15	1	Gregory et al. (terminology paper) recommend using the phrase "mantle dynamic topography" for this. Just "dynamic topography" is ambiguous, because it could equally mean "ocean dynamic topography". [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. Changed.
27241	4	15	1	15	2	More appropriate references in replacement of Dutton et al. (2015) would be Austermann et al (2017) and Dusterhus et al (2016) as above and previously referenced [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. References added.
6155	4	15	4	0		Insert "the" before "LIG"; change "remain" to "remains"; insert "the" before "peak" [Nina Hunter, South Africa]	The Chapter Team prefers the original wording.
1681	4	15	4	15	7	Clarify what is meant by a double peak in GMSL. If sea level peaked twice, how far apart did this occur? And clarify what is meant by uncertainties in GIA corrections [Nora Richter, United States of America]	This has been clarified.
27243	4	15	5	15	6	Add reference to Barlow et al. (https://doi.org/10.1038/s41561-018-0195-4) along with Rovere et al. (2016) as this paper directly raises uncertainty as to the shape of the LIG peak. [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	Good suggestion. Reference to Barlow et al has been added.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28587	4	15	5	15	7	A recent article by Barlow et al. (2018) further explores the feasibility of current explanations for a double peak in the sea-level curve during the Eemian. Suggest adding text at the end of the sentence which currently ends on line 7: "...uncertainties in GIA corrections and Barlow et al. (2018) are unable to identify processes that could lead to the necessary drop in sea-level required to produce a double peak." [Barlow, N.L.M. et al., 2018. Lack of evidence for a substantial sea-level fluctuation within the Last Interglacial, Nature Geoscience, 11, 627-634.] [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	See above.
2159	4	15	6	15	7	But see, for instance, local evidence for multiple peaks, e.g. Vyverberg et al 2018 (doi:10.1016/j.margeo.2018.02.010) [Robert Kopp, United States of America]	See Barlow reference above.
27245	4	15	6	15	7	Publication by Dusterhus et al (doi: 10.1093/gji/ggw174) also shows that the double peak is likely due to GIA uncertainties. Barlow et al (https://doi.org/10.1038/s41561-018-0195-4) also consider the geological evidence for a large double peak in sea level, but find no evidence for it from the palaeo record, or any feasible mechanism, suggesting it is most likely due to the assumptions which have to be made for the GIA correction. [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. This discussion is now improved.
10319	4	15	8	15	9	IS there any effort to solve this dispute??? Pls mention ifthere is or not? [Mahmood Riyaz, Maldives]	Work is ongoing, but not directly relevant to the assessment.
27247	4	15	12	15	12	More appropriate references in replacement of Dutton et al. (2015) would be Dutton et al. (http://dx.doi.org/10.1016/j.quascirev.2014.10.025) [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. Reference added.
6157	4	15	14	15	16	Insert "the" before "WAIS" [Nina Hunter, South Africa]	Agreed.
2555	4	15	15	15	15	course -> coarse [Michiel Van den Broeke, Netherlands]	Agreed. Typo fixed.
11361	4	15	15	15	15	As related by P.Voosen (Science, December 21, 2018) based on an AGU presentation by A.Carlson and colleagues, there is a claim that " the west antarctic ice sheet apparently collapsed during the last interglacial". I understand that this is not a publication but it could be worth to explore if there a draft submitted or in review (I'am convinced thta the authors are doing so but I point out to this result which if confirmed - far to be the case yet - would be extremely important). [jean jouzel, France]	Agreed in principle, but to our knowledge no paper exists to support this.
19799	4	15	15	15	15	"albeit using course resolution models". This sentence seems not contributing to the overall meaning of the statement, so it's best removed. [APECS Group Review, Germany]	This has been fixed.
19801	4	15	15	15	16	Suggestion: this line should be placed higher up, preferably at the start of the paragraph. [APECS Group Review, Germany]	This is a concluding statement. The Chapter Team prefers the original wording.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17675	4	15	16	15	16	Not clear why just WAIS mentioned here when also true of EAIS [Matt King, Australia]	Agreed. Changed.
1683	4	15	18	15	32	Are changes in the Greenland and Antarctic ice sheets considered to be in phase or out-of-phase during the LIG? [Nora Richter, United States of America]	Timing is clearly important, but limited information about the phasing exists. This point has been added.
2161	4	15	18	15	32	This discussion of LIG Greenland glosses over the substantial discrepancy between models fit to elevation data (e.g., Dahl-Jensen et al., 2013) and those fit to temperature data (e.g., Yau et al., 2016). While some simulations indicate a contribution of not more than 2.5 m, others indicate 4-6 m (e.g., Yau et al., 2016). Lines 27-28 put a thumb on the scales in a manner that doesn't accurately reflect disagreement in the literature. [Robert Kopp, United States of America]	This emphasis on the lower estimates is based on an assessment of the modeling work suggesting major ice retreat, however the full range is now better represented.
27249	4	15	18	15	32	It would be worth noting that recent work has shown that uncertainties in Greenland response during the LIG is in part due to model choice and whether SMB is included. Reference to this uncertainty would be worth including e.g. Plach et al. (https://doi.org/10.5194/cp-14-1463-2018) [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	This is a good suggestion. Plach results are now included.
30197	4	15	25	15	25	the wording "accurate" is misleading here - there are still several issues und uncrtainties, and replacing "accurate" by "improved" (compared to pre-Argo estimates) would be adequate. In addition, a huge numbers of papers had been published on the topic of the sea level budget closure, most of them are cited for example in the latest WCRP paper (https://doi.org/10.5194/essd-10-1551-2018) - at least this paper could be cited - but it should be more of an assessment. [Karina von Schuckmann, France]	"accurate" is not used here.
30199	4	15	26	15	29	Why are these statements not underlined with references? Moreover, links to other chapters in SROCC could be identified here, e.g. to chapter 1 where an overview on the instrumental period is given, as well as to chapter 5. [Karina von Schuckmann, France]	It is not clear what statements are missing references.
19803	4	15	31	15	31	"interglacial" change to LIG. The entire paragraph tells me that Greenland ice sheet was never a major sea level contributor. "BEFORE GIS was a...." implies that it later became a major contributor during the LIG. The last part of the sentence should be removed. [APECS Group Review, Germany]	The Chapter Team thinks the use of "Interglacial" is okay here, but we agreed about the confusing structure. This has been reorganized.
6159	4	15	37	15	39	Suggest rephrasing so that the sentence makes sense: the extent and thickness of the ancient LIG ice sheet is not constrained [Nina Hunter, South Africa]	see above.
10321	4	15	42	15	45	What would be in implication of this conclusion to the overall outcome of this assessment? [Mahmood Riyaz, Maldives]	Antarctica was a major contributor to sea level in repsonse to modest forcing.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10823	4	15	42	15	45	Perhaps it is obvious, but I think it might be worth pointing out that the confidence in the actual numbers is low [Magnus Hieronymus, Sweden]	It is not clear what numbers are being referred to here.
19805	4	15	43	15	43	Suggestion: Add in the sentence above: "but unlikely exceed 10m than present day" . [APECS Group Review, Germany]	A statement has been added with a likely upper bound.
28589	4	15	48	15	54	I was surprised at the lack of discussion of processes associated with the large-scale ice sheet retreat in this section. It is mentioned that the Last Deglaciation is the last time we saw major ice sheet retreat, and the text states: "data from this period may reveal information on the physical processes causing the ice sheet retreat", but then there is just a brief mention that iceberg calving played a role in the deglaciation of Pine Island Bay, Antarctica. Given the desire to understand processes that may lead to future rapid ice sheet retreat this issue warrants much more attention, or at least a reference to another part of the report where the processes that cause ice sheet retreat are discussed in detail. Issues that could be discussed include: the balance between changes in snowfall, ice melt, and ice velocity in a warming world, and the impact of ice sheet retreat from a marine-based configuration to a terrestrial-based configuration. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	section has been removed
19797	4	15	56	16	7	Some information are missing: rates of meltwater pulse 1B could be reported here. Also Golledge et al (2014) have shwon that Antarctica contributed to meltwater pulse 1B. Antarctic contribution is not mentioned here. [APECS Group Review, Germany]	section has been removed
19807	4	15	57	15	57	Tahiti and elsewhere. Reference missing. [APECS Group Review, Germany]	section has been removed
28591	4	15	57	15	57	Meltwater pulses were first identified in the Barbados record [Fairbanks, R.G., 1989. A 17,000 year glacio-eustatic sea-level record: influence of glacial melting rates on the Younger Dryas event and deep-ocean circulation. Nature, 342, 637-642.] [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	section has been removed
23363	4	16	0	16		Explain more clearly what is new since the AR. [Valerie Masson-Delmotte, France]	section has been removed
17677	4	16	1	16	1	20m needs a confidence measure [Matt King, Australia]	section has been removed
28593	4	16	1	16	1	The quoted duration of Meltwater Pulse 1A is incorrect. In the referenced article (Carlson, 2009) the timing is given as ~14.6 ka BP, and the duration is given as ~500 years. The magnitude of the sea-level rise quoted on line 1 (20m) is in agreement with the referenced article. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	section has been removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13941	4	16	1	16	4	There are more recent modelling studies looking at the contribution to meltwater pulse 1A from the Laurentide Ice Sheet, e.g. Gregoire et al (2016), GRL; Ivanovic et al (2017), GRL - it may be relevant to include these in this assessment. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	section has been removed
1685	4	16	1	16	7	Estimates for the rate of sea level rise during thse metlwater pulses should be included here. [Nora Richter, United States of America]	section has been removed
27253	4	16	1	16	7	This text is rather weak, with out of date chronologies. The MWP 1B section could be updated with more recent dating, for example by Abdul et al. (doi: 10.1002/2015PA002847) to 11.45-11.1 kyr BP though it is worth noting that the existence of MWP 1B is still contentious (e.g. the comment by Bard et al to the Abdul paper and the Bard et al 2010 10.1126/science.1180557 paper). More recent chronology for MWP 1A can be found in Deschamps et al. (doi: 10.1038/nature10902) which suggest the MWP was a short-lived event 14.6-14.3 ka yr BP, not the 3300 yr duration given in the current text. If the mid-Holocene sea level fluctuation is given consideration, so should the 8.2 ka event (e.g. Tornqvist and Hijma doi: doi:10.1038/ngeo1536) with recent modelling work showing that the 'jump' could have been caused by accelerated melting from the collapsing ice saddle over the Hudson Bay (Matero et al. doi: doi.org/10.1016/j.epsl.2017.06.011). [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	section has been removed
28595	4	16	3	16	3	The text "...this contribution originates from..." is ambiguous as to whether it refers to MWP-1a or MWP-1b. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	section has been removed
2473	4	16	4	0	7	I am unconvinced by this assessment. I have read the Leonard et a. manuscript and discussed it with an expert in the discipline. Our interpretation is that the Leonard et al. conclusion of fluctuations in sea level is likely incorrect and a result of conflated regional variations with temporal variations. This new analysis is unpublished at this time but I think some caution is called for. Song et al. present evidence of a mid Holocene high stand - these are known around the world be do not represent a fluctuation as such (rather locally relative sea level rose rapidly, then the rate slowed and then slowly fell to present day values). I am unable to judge the He et al. result, but it does not seem convincing evidence of a sea level fluctuation. [John Church, Australia]	section has been removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28549	4	16	4	16	7	Would it be possible to give estimates of this mid-Holocene change after site to site (between xx annd yy m) ? [jean jouzel, France]	section has been removed
2999	4	16	9	16	11	The statement that the past marine transgression occured during very different conditions from today seems a very important caveat for coastal stakeholders looking for high end scenarios. I wonder if it can be included in the executive summary. [Goneri Le Cozannet, France]	section has been removed
19809	4	16	9	16	11	This also holds ofr the Last Interglacial (Eemian): orbital leds to slightly warmer climate thant today, but with CO2 much lower than today (284-287 ppm). It should be mentioned here. [APECS Group Review, Germany]	section has been removed
27255	4	16	9	16	11	Agreed, however the idea of saddle collapse (which has been invoked in a couple of deglaciation models e.g. Gregoire et al. 2012 and Matero et al. 2017) has been suggested as potential mechanism during retreat of the Greenland ice sheet (Huybrechts et al 10.1007/s10712-011-9131-5). Sensitives to ice sheets due to GHG are also show during the deglaciation in Gregoire et al. (https://doi.org/10.1002/2015GL066005) [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	section has been removed
6161	4	16	11	0		Remove "be" [Nina Hunter, South Africa]	section has been removed
19811	4	16	13	16	29	Citation suggestion: https://www.springer.com/de/book/9783319564890 [APECS Group Review, Germany]	This paragraph is an intorductory paragraph in which we explain the global picture of the sea level observing capacity. The book you refer to is a collection of scientific papers that adress different scientific questions related to sea level and the sea level budget. Actually only few papers in this book deal with the observing system. We think it is not relevant to cite this book here. However in the following sections we do refer several times to some of the papers of this book.
27251	4	16	15	16	15	There is absolutely no consideration of salt marsh records, which provide much of the baseline of late Holocene sea level change and provide the evidence that modern rates of sea level change are unprecedented. There is a large amount of work in this area, with numerous individual records showing spatial variability. However, at a minimum the paper by Kopp et al. (2016 - already in the reference list in a different context) which compiles many of the records published at the time and shows the marked recent acceleration within the recent climate context. [Natasha Barlow, United Kingdom (of Great Britain and Northern Ireland)]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3001	4	16	16	16	16	The reader may wonder wether this does only refer to Brest or if there are other records with data back to the 18th century? The authors may consider naming the records or linking to a reference allowing to identify the tide gauge having records back in the 18th century. (same comment line 32) [Goneri Le Cozannet, France]	accepted and corrected
2475	4	16	19	0	19	GRACE is no longer operational [John Church, Australia]	accepted and corrected
28597	4	16	19	16	19	Here, and elsewhere, mention of the GRACE Follow-On mission, launched in May 2018, should be included. The original GRACE mission ended in 2017. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	accepted and corrected
17679	4	16	20	16	21	The V&W refs are very old and date to a period 2-3 years after launch when robustness of trends were limited. Replace by more recent work [Matt King, Australia]	accepted and corrected
19813	4	16	21	16	21	"confirming", should be "confirmed". [APECS Group Review, Germany]	accepted and corrected
2557	4	16	23	16	23	These references are outdated; use Mouginot and others (ONAS, 2018) for GrIS and Rignot and others (PNAS, 2018) for AIS. [Michiel Van den Broeke, Netherlands]	accepted and corrected
2477	4	16	24	0		Argo only gives coverage to 2000m [John Church, Australia]	accepted and corrected
6163	4	16	29	0		Remove "the" before "understanding" [Nina Hunter, South Africa]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
1815	4	16	31	17	15	Page 4-16 Line 31 to 4-17 Line 15 Whilst the science and understanding around mean sea level has advanced since AR5, so too have the time series analysis techniques for long tide gauge records to more accurately determine mean sea level and the associated time varying nature of velocities and accelerations. These techniques enable researchers to make better use of the long tide gauge records available, providing an improved understanding of the spatial variations in velocity and accelerations of mean sea level at the regional level than has been previously available (refer Watson, 2016, 2017a, 2018a and "General Comments" above for examples of these improved insights). It is important that these advancements relating to tide gauge records are also highlighted. References: Watson, P.J., 2016. Acceleration in U.S. mean sea level? A new insight using improved tools. Journal of Coastal Research. Volume 32, Issue 6, pp. 1247 – 1261. Coconut Creek (Florida), ISSN 0749-0208. DOI: 10.2112/JCOASTRES-D-16-00086.1. Watson, P.J., 2017a. Acceleration in European mean sea level? A new insight using improved tools. Journal of Coastal Research. Volume 33, Issue 1, pp. 23 – 38. Coconut Creek (Florida), ISSN 0749-0208. DOI: 10.2112/JCOASTRES-D-16-00134.1. Watson, P.J., 2018a. Improved Techniques to Estimate Mean Sea Level, Velocity and Acceleration from Long Ocean Water Level Time Series to Augment Sea Level (and Climate Change) Research. Doctoral dissertation, PhD thesis, School of Civil and Environmental Engineering, University of New South Wales, Australia. [Phil Watson, Australia]	rejected. In this chapter we don't have room to highlight all findings on sea level changes since AR5. For the tide gauge records section we decided to focus on the results on global mean sea level since AR5 because these results are very relevant for the evaluation of climate models which are the basis on which we build sea level projections (section 4.2) and we anticipate the potential impacts (section 4.3)
19815	4	16	32	16	32	Remove both commas from the sentence. [APECS Group Review, Germany]	accepted and corrected
22063	4	16	32	16	36	All these instrumental limitations are correct and should be stated. However it is also worth to note that tide gauges are the only instruments providing accurate measurements (of the order of the millimiter) of relative sea level changes at secular time scales. [Julia Pfeffer, Australia]	rejected. This is already indicated on page 16 line 15
19817	4	16	33	16	33	Remove "of continents and islands". [APECS Group Review, Germany]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22065	4	16	37	16	39	References are missing to provide a fair assessment of the litterature about the effects of vertical land motions on tide gauges. Kleinherenbrink et al., 2018 provide a recent review of the litterature. Pfeffer and Allemand, 2016 is the only paper comparing directly the impact of vertical land motion on local tide gauge measurements (comment 3). Pfeffer et al., 2017 is the only comprehensive review of the various causes of vertical land motions at tide gauges (comment 7) . Refrence: Kleinherenbrink, M., Riva, R., & Frederikse, T. (2018). A comparison of methods to estimate vertical land motion trends from GNSS and altimetry at tide gauge stations. Ocean Science, 14(2). [Julia Pfeffer, Australia]	accepted and corrected
3003	4	16	39	16	39	I think that the reference Raucoules et al 2010 (a seismotectonics study) is actually Raucoules et al. (2013) Raucoules, D., Le Cozannet, G., Wöppelmann, G., De Michele, M., Gravelle, M., Daag, A., & Marcos, M. (2013). High nonlinear urban ground motion in Manila (Philippines) from 1993 to 2010 observed by DInSAR: implications for sea-level measurement. Remote sensing of environment, 139, 386-397. [Goneri Le Cozannet, France]	accepted and corrected
19819	4	16	41	16	42	Remove "when they are co-located with tide gauges". [APECS Group Review, Germany]	accepted and corrected
17681	4	16	43	16	44	It is not the message of Riva et al 2017 that correcting VLM on long time scales is difficult. The message is that the spatial location of mass changes and their magntiude over the tide gauge record is important in interpreting tide gauge records, but that aside from Antarctica we now have forward models to do that for the 20th century [Matt King, Australia]	Partially accepted. One of Riva et al. 2017 main messages is that " deformation rates have been strongly varying through the last century". As a consequence the GPS approach can not be used to estimate VLM over time scales longer than a few decades. We clarified this point in the revised report
4019	4	16	49	16	49	Double check should be -0.002 to 0.019 mm yr-2, or mm yr-1 [Lim Lee-Sim, Malaysia]	accepted. It is double checked now.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3005	4	16	51	17	49	The paragraph is interesting and clearly shows the new results since AR5. However, the last sentence is unclear to me. "The range is large and could be improved (Watson, 2016)." How does Watson (2016) suggest that the range can be improved? I suppose that this is through the use of advanced statistical techniques besides simple quadratic adjustments (?). However, please note that Visser et al (2015) suggest using different statistical techniques, which may result instead on a larger uncertainty range, since structural uncertainties due to the choice of a particular statistical model would be explicitely quantified. Visser, H., Dangendorf, S., & Petersen, A. C. (2015). A review of trend models applied to sea level data with reference to the “acceleration-deceleration debate”. Journal of Geophysical Research: Oceans, 120(6), 3873-3895. [Goneri Le Cozannet, France]	accepted. The sentence has been removed
26997	4	16	53	16	53	I'm not keen on the jargon word "fingerprint". You could say "the patterns associated with ocean dynamic change, GIA and change in land ice". The land-ice patterns are GRD-induced, in the terminology of Gregory et al. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	accepted and corrected
19823	4	17	1	17	3	Sorry I don't even know what this sentence is trying to convey. Sentence re-structuring is needed. [APECS Group Review, Germany]	accepted and corrected
2479	4	17	2	0		I think it is incorrect that the new estimates are significantly smaller before 1950. The significant differences actually occurred over 1950 to 1970. [John Church, Australia]	accepted and corrected
6165	4	17	2	0		Change "trend" to "trends" [Nina Hunter, South Africa]	accepted and corrected
19825	4	17	6	16	6	Remove "for the difference". [APECS Group Review, Germany]	accepted and corrected
19827	4	17	7	17	7	Remove "rather". [APECS Group Review, Germany]	accepted and corrected
19829	4	17	9	17	11	But on the above it was mentioned that "Church et al. (2013) concluded that it is very likely that the long-term trend in GMSL from tide gauge records is 1.7 (1.5 to 1.9) mm"..... Is this a contradiction? [APECS Group Review, Germany]	No it is not a contradiction as the new assessment is consistent with the AR5assessment within the uncertainty range. It is just that the uncretainty range is now widened

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22067	4	17	9	17	11	How did you come to the conclusion of 1.6 mm/yr ? Rather than allowing larger uncertainties, recent work show that regional (Hay et al., 2015 takes into account sea level fingerprints from ice melting and simulations from ocean general circulation models) and local (Dangendorf et al. 2017 consider various corrections for vertical land motions) variability should be accounted for when reconstructing GMSL rise based on a sparse number of tide gauges. Limitations of previous approaches assuming static patterns represented as EOF (Church and White, 2011) or using more or less sophisticated techniques to average data (Jevrejeva et al., 2008) have been put forward by this more recent work. Taking the average of past and recent work does not provide a fair assessement of GMSL rise. It raises at least the following question : what studies do you consider for your average? Until when do you go back in the litterature? Why? [Julia Pfeffer, Australia]	rejected. The recent studies from Hay et al. and Dangendorf et al. do not show that regional and local variability should be taken into account. They show that when spatial patterns associated with the land ice loss are taken into account and when vertical land motion is corrected for in tide gauge records then their sea level reconstructions based on their own selection of tide gages show smaller sea level changes over 1950-1970 leading to smaller trend over the 20th century. Hay et al. and Dangendorf et al. are not able to show that using climate models instead of EOFs to account for the ocean variability lead to a more realistic reconstruction. They are not able either to rule out the tide gauge averaging method from JEvrejeva (Dangendorf et al. uses actually an averaging method developped on the basis of Jevrejeva method and which is very close to Jevrejeva method). In addition Hay et al. and Dangendorf et al. are both using a selection of tide gauges with a high number of Arctic and north atlantic tide gauges which tend to favor low trends in 20th century sea level reconstructions. Neither of Hay et al. or Dangendorf et al. have been able to test the sensitivity of their reconstruction to the selection of tide gauges. There are good reason to think that the sensitivity of reconstructions to the tide gauge selection isthe primary reason for the differences across reconstructions (Hamlington and Thomson 2015). So, on the basis of the 2 recent studies, we assess that it is not possible for now to rule out old reconstructions. On this conclusion we adopt a very simple rationale to derive the value 1.6mm/yr. We use the most recent reconstruction from each group and average them together.
10825	4	17	10	17	10	It is clear from the text where the downward revision comes from, but not why the upper bound is higher for the new estimate [Magnus Hieronymus, Sweden]	accepted. Now it is corrected and clarified in the text
23713	4	17	10	17	10	It is clear from the text where the downward revision comes from, but not why the upper bound is higher for the new estimate. Please amend as appropriate. [Government of Sweden, Sweden]	accepted. Now it is corrected and clarified in the text
586	4	17	11	17	12	It should be noted that even thoough 80% of the evidence agrees, only 5 records long enough to make the estimates should taken into consideration when interpreting that level of confidence. [Jenna Pearson, United States of America]	It is true that we are analysing only 6 reconstructions of global mean sea level but these reconstructions are based on tenths to hundreds of independent tide gauge records around the world which all show unequivocally evidences of sea level rise at rates close to the global rate. Thisis the basis that gives us high confidence in our conclusion here
23715	4	17	14	17	14	The last sentence is kind of superfluous and does not provide new information, as the range is already given (cleary large), and improvements always can be made. [Government of Sweden, Sweden]	accepted and corrected
25271	4	17	14	17	14	Typo in the value/range provided [Kristian K. Kjeldsen, Denmark]	rejected. We double checked and it is actually the right range
17683	4	17	14	17	15	final sentence of the paragraph is vague, adds nothing. [Matt King, Australia]	accepted. The last sentence was removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19831	4	17	14	17	15	Remove the last sentence, unless the author can dedicate more time to elaborate more on the sentence "the range is large and could be improved". [APECS Group Review, Germany]	accepted. The last sentence was removed
2731	4	17	17	17	30	Six groups (AVISO/CNES, SL_cci/ESA, University of Colorado, CSIRO, NASA/GSFC, NOAA) provide altimetry-based GMSL time series. All of them use 1 Hz altimetry measurements derived from the aforementioned reference missions which provide the most accurate long-term stability at global and regional scales (Ablain et al., 2017). [Thian Yew Gan, Canada]	accepted and corrected
2733	4	17	17	17	30	Ablain et al., 2017, TOPEX-A Drift and Impacts on GMSL Time Series, https://meetings.aviso.altimetry.fr/fileadmin/user_upload/tx_ausyclsseminar/files/Poster_OSTST17_GMSL_Drift_TOPEX-A.pdf [Thian Yew Gan, Canada]	rejected. This reference has not been peer reviewed
19833	4	17	18	17	21	Is there references for all these information ? [APECS Group Review, Germany]	There is no scientific analysis in this so we don't need to reference any peer reviewed article here. This is commonknowledge in the scientific community/space agencies.
2481	4	17	21	0		Incorrect. Vertical motion of the ocean floor directly affects sea level as measured by satellites. [John Church, Australia]	In this sentence we only adress the question of the vertical land motion and not the question of ocean floor. But we understand that it could be misleading. We remove this sentence
22003	4	17	26	17	27	MSL cannot have a rate…although it's change can… [David Schoeman, Australia]	accepted and corrected
30201	4	17	26	17	28	Information devating from AR5 results should be underlined with scientific peer review assessment - such as here a different rate of global sea level rise over the altimeter era - no single reference is given here. [Karina von Schuckmann, France]	rejected. The references are given in the previous sentence
19821	4	17	26	17	31	There is a lack of uncertainty language in the sentence. “Accounting for this drift leads to a revised rate of the global MSL from satellite altimetry of 3.0 mm yr–1 (2.4–3.6) over the period 1993–2015 instead of 3.3 mm yr–1 (2.7–3.9) as stated in the AR5. Hence, a revised estimate of the satellite altimetry GMSL record now shows an acceleration of 0.084 (0.059–0.090) mm yr–2 over 1993–2015 (Watson et al., 2015; Nerem et al., 2018). This acceleration is mostly due (Insert high confidence or medium confidence) to an increase in Greenland mass loss since the 2000s (Chen et al., 2017; Dieng et al., 2017).” [APECS Group Review, Germany]	accepted and corrected
2955	4	17	26	17	32	Uncertainty should be restated in IPCC conventional expressions [Xingrong Chen, China]	accepted and corrected
16537	4	17	30	17	30	Might be worth noting that mass loss from Antarctica has also increased over this time interval (The Imbie Team, 2018) [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	rejected. This is already noted in the following sentence
19835	4	17	31	17	31	What is "all other components"? [APECS Group Review, Germany]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2483	4	17	32	0		Recovery from Pinatubo would contribute to a decelerating (not increasing) rate of sea level rise. [John Church, Australia]	rejected. As you are well aware a volcanic eruption makes sea level fall during 1 to 2 yearsjust after the eruption. Then sea level recovers to its pre-eruption rate of rise (Church et al. 2005). During the first 2 years after the eruption sea level decelerates to small rates of rise or even negative rates because sea level is falling. Then during the following years, when sea level recovers to the pre-eruption rates, sea level accelerates to get back to positive rates of rise. Pinatubo occured in 1991 which is 2 years before the starting of the Satellite altimetry record. So in 1993 when satellite altimetry started it observed an accelerating GMSL because it was observing the recovery from Pinatubo more than 2 years after the eruption.
6167	4	17	32	0		Suggest remove "the" [Nina Hunter, South Africa]	accepted and corrected
11445	4	17	37	17	46	The subsection title is self explanatory, so I don't think there's a need to dedicate a paragraph to explain what will be done in the section. [Anson Cheung, United States of America]	rejected. The title does not explain that we will look at the observed sea level budget and that we will compare it to the sea level budget simulated by climate models in order to evaluate climate models. This is the purpose of this paragraph
4709	4	17	38	0		What exactly does "closure of the sea level budget" mean? This is an important concept that comes up repeatedly and needs a clear explanation. [Debra Roberts and Durban Team, South Africa]	accepted and corrected
25641	4	17	39	17	39	Climade to be changed as climate [Government of India, India]	accepted and corrected
6169	4	17	45	0		Insert "us" after "enables" [Nina Hunter, South Africa]	accepted and corrected
10323	4	17	45	17	46	It enables to evaluate the confidence we have in current climate models that form the basis of future sea level projections add "level" so the sentence reads "It enables to evaluate the lconfidence level we have in current climate models that form the basis of future sea level projections" [Mahmood Riyaz, Maldives]	accepted and corrected
19837	4	17	49	17	49	Above uses GMSL. Please standardize the abbreviations. [APECS Group Review, Germany]	Accepted. Replaced with GMSL.
30205	4	17	49	17	51	There are a large number of papers after AR5, whic could be cited here, and correspondingly, the ranges for the steric estimate should be adopted / assessed accordingly, see for example the WCRP paper as an overview https://doi.org/10.5194/essd-10-1551-2018); also more up-to-date estimates going up to the year 2016 are available and should be included in SROCC. [Karina von Schuckmann, France]	Accepted. WCRP paper reference included.
19841	4	17	49	17	53	This entire paragraph should be placed in page 4-18, line 55-56. The next paragraph (introduction of thermal expansion) should be the first section. [APECS Group Review, Germany]	Rejected. The focus of this section is contributions to GMSL rise. Opening paragraph for this subsection summarises the importance of the thermal expansion contribution to observed GMSL rise, as assessed by AR5. Text modified to be clearer.
19839	4	17	50	17	50	I understand that the value varies with the period of year, but perhaps can standardize the values (GMSL and year) so it wouldnt be confusing for layperson. [APECS Group Review, Germany]	Partially accepted. Clarification for the choice of baseline periods related to AR5 assessment (1971-2010 and 1993-2010) included now. In SROCC, reference periods start in 1970 and 1993 but we now have longer records to 2015.

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11085	4	17	51	17	52	In this section the analysis of the Thermal expansion current knowledge is addressed, I do not see the point of mixing, and anticipating, the unrelated conclusion that “The ocean heat uptake is very likely due to anthropogenic GHG emissions”. [Valentina R. Barletta, Denmark]	this is an opening paragraph summarising the observed thermal expansion rate, its causes (increase in ocean heat content) and attribution (largely anthropogenic drivers) are assessed in AR5 (Chapters 3, 10 and 13). However, there is now an SROCC cross-reference to Sections 1.4.1 and 5.2.2.2.2.
30207	4	17	51	17	53	should be linked to chapter 5, where more information are available. [Karina von Schuckmann, France]	Accepted. Cross-references included.
22069	4	17	56	17	56	What is EG? [Julia Pfeffer, Australia]	Accepted. Typo removed.
30209	4	18	1	18	2	This statement is very strong, and it is far too vague. Ideal for what? If you go so far, you could state the same for all other tools - they all have advantages, but also uncertainties. What is the purpose here to state this strongly as it stands here? Also the argument just before that full-depth observations are needed with respect to global mean thermal expansion is very vague - having in mind that the changes in the abyssal ocean comparable to the ones in the upper 2000m depth are still much smaller than our uncertainties estimates. [Karina von Schuckmann, France]	Partially accepted. An extra reference and link to relevant text in Chapter 1 now included. Text partially modified.
30211	4	18	1	18	12	Risk of repetition in SROCC - a clear cross-chapter coordination with chapter 1 and chapter 5 is needed here. [Karina von Schuckmann, France]	Partially accepted. Some degree of overlap is inevitable. Text reduced. Cross-links for Chapter 1 included.
6171	4	18	5	0		Add "s" onto "2000" (should read: 2000s) [Nina Hunter, South Africa]	N/A. Text removed.
3631	4	18	12	18	12	5.2.1.2. --> 5.2.2.2.2 [Nam SungHyun, Republic of Korea]	Aceppted. Typo corrected.
30213	4	18	14	18	15	Those kind of information (e.g. the % range) should be underpinned from referenced paper assessed here, or do those numbers come from? Over which periods had those been obtained? [Karina von Schuckmann, France]	Accepted. Text removed. Reference for WCRP sea level budget paper included.
11087	4	18	14	18	18	In this first block the authors discuss the agreement in the literature in thermal contribution to the Global Mean Sea Level estimates for the period 1993-2015 in term of pure percentage. [Valentina R. Barletta, Denmark]	Accepted. Text updated.
15597	4	18	14	18	27	In this first block the authors discuss the agreement in the literature in thermal contribution to the Global Mean Sea Level estimates for the period 1993-2015 in term of pure percentage. In this second block they start saying that the agreement is better, but they only talk about global ocean heat gain in W/m^2. This makes any understanding of the authors’ claim of this difference in agreement obscure for the reader, those quantities are not comparable. [EUCE, Belgium]	Aceepted. Text updated.
10325	4	18	15	18	17	Hw significance is this difference? And what are the imlpication for the predictions? [Mahmood Riyaz, Maldives]	N/A. Text removed.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
30215	4	18	20	18	20	Be clear: Argo reached 100% planned near-global coverage by the end of the year 2005. It is not a range like 2006-2007. [Karina von Schuckmann, France]	Accepted. Argo achieved its targeted global coverage in November 2007. Riser et al. 2016.
588	4	18	20	18	27	Are any biases in sampling taken into account of thse floats? That is, do the preferentially sample areas with a certain heat content because of their Lagrangian nature? [Jenna Pearson, United States of America]	Answer: Argo array is designed to maintain at least one float for each 3 x 3 degree box, from 60N to 60S, ice-free open ocean. Please see Riser et al. 2016.
11089	4	18	20	18	27	In this second block they start saying that the agreement is better, but they only talk about global ocean heat gain in W/m^2. This makes any understanding of the authors' claim of this difference in agreement obscure for the reader, those quantities are not comparable. [Valentina R. Barletta, Denmark]	N/A. Text updated.
4711	4	18	26	0		It appears from this report that the greater ocean water heat gain in the Southern Hemisphere is the reason why air temperatures in the South (which is covered by more water) have not gone up as much as in the North (which contains a lot of land mass). Is this explained clearly somewhere? Or could this be mentioned here? [Debra Roberts and Durban Team, South Africa]	Answer: this section only addresses ocean changes.
6173	4	18	27	0		Insert "to" after "due" [Nina Hunter, South Africa]	Accepted. Text inserted.
11447	4	18	29	18	30	Are those 13 member ensemble timeseries from models, reanalysis, reconstruction ensemble or something else? [Anson Cheung, United States of America]	Answer: observations-only. Clarified in text now.
408	4	18	30	18	30	Chapter 4 page 4-18, line 30, (Cazenave et al 2018). This is an the article produced by the WCRP team, so there reference could be (WCRP team, 2018) just as you find it on the journal article. [Ernst Schrama, Netherlands]	Accepted. Replaced with With WCRP sea level budget group.
19843	4	18	32	18	32	I, for one, do not know when is the Argo Decade. Use proper 2000-2010 format would be better, perhaps? [APECS Group Review, Germany]	Accepted. 2005-2015.
2485	4	18	34	0		I do not understand the rationale - if we do not make any observqtions we are to assume no change, then a rapid acceleratin when we start to make observations? [John Church, Australia]	Accepted. Text inserted to clarify link with likely undersampling prior to 2005.
19845	4	18	47	18	47	"the model results". Which models ? For which studies ? [APECS Group Review, Germany]	accepted and corrected
22071	4	18	50	18	52	This statement is not supported by the references cited. [Julia Pfeffer, Australia]	accepted and corrected

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22073	4	18	52	18	56	This statement is somehow over-optimistic. There are still large uncertainties both on the observations and simulations of thermal expansion. It contributes for a lot in the uncertainties on the global sea level budeget both on recent and multidecadal time scales. There is still a gap between the simulations and the observations according to the litterature and the values given in table 4.1. [Julia Pfeffer, Australia]	Rejected. The statement is based on multiple lines of evidence: we have now improved observed and modelled estimates of thermal expansion. There is a good agreement between both estimates. In addition the energy budget and radiative forcing of the climate system are consistent with the thermal expansion (Llovel et al. 2014, von Shuckmann et al. 2016, Meyssignac et al. 2019). And we have an improved understanding of the spread between modelled estimates of the thermal expansion. This enables to confirm the high confidence level in climate model simulation and projections of the thermal expansion as stated in the AR5
2487	4	18	54	0	55	WOW! High confidence? [John Church, Australia]	Rejected. The statement is based on multiple lines of evidence: we have now improved observed and modelled estimates of thermal expansion. There is a good agreement between both estimates. In addition the energy budget and radiative forcing of the climate system are consistent with the thermal expansion (Llovel et al. 2014, von Shuckmann et al. 2016, Meyssignac et al. 2019). And we have an improved understanding of the spread between modelled estimates of the thermal expansion. This enables to confirm the high confidence level in climate model simulation and projections of the thermal expansion as stated in the AR5
6175	4	19	7	0		Suggest removing "now" [Nina Hunter, South Africa]	accepted and corrected
2491	4	19	19	20	8	There is no discussion about the potential impact of small galciers that may have already disappeared and thus are ot included in modern inventories. [John Church, Australia]	taken into account - we added a statement about their contribution, but do not include it in the assessment of the sea-level budget because we have low confidence in the numbers
19847	4	19	20	19	23	Replace continuing with determining for a better understanding of the text: “To assess the mass contribution of glaciers to sea level change, global estimates are required. Recent updates and temporal extensions of estimates obtained by different methods continue to provide very high confidence in determining glacier mass loss on the global scale and show increased agreement on rates of mass loss during the 20th century, compared to earlier estimates reported by Vaughan et al. (2013).” [APECS Group Review, Germany]	rejected - the use of "continuing" here is to emphasize that mass loss of glacier continues, not that it is possible to determine its rate
28395	4	19	20	19	27	An udpated GIC estimate for 1992-2017 is provided in Bamber et al 2018 and improves on Marzeion 2015 for a number of sectors for that time period [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	accepted - we included the study by Bamber et al in our assessment
19853	4	19	23	19	23	"during the 20th century". Reference suggestion: Marzeion, B., Champollion, N., Haeberli, W. et al. Surv Geophys (2017) 38: 105. https://doi.org/10.1007/s10712-016-9394-y. [APECS Group Review, Germany]	taken into account - we adress the specifics of the agreement of different methods to estimate mass change in greater detail further down in the section
2489	4	19	24	0		Which observed perod? [John Church, Australia]	accepted - period (since mid 20th century) is now specified in the text
19855	4	19	24	19	25	"rates of mass loss were found to be unprecedented during the observed period", which is how much? [APECS Group Review, Germany]	accepted - period (since mid 20th century) is now specified in the text

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26109	4	19	25	19	25	This should be reformulated: Zemp is based on individual glacier measurements. Although they (very crudely) extrapolate to the global scale) which is highly problematic given the biased geographica distribution of the data and the scarcity of data, their paper key analysis is the analyis of single glacier measurements. So, 'global scale' is misleading. Perhaps 'Rates of .... glacier mass loss from XXX glaciers (or based on XXX individual glacier measurements) were found to be ...." [Regine Hock, United States of America]	taken into account - we added a reference to the Zemp et al. (2019) paper, which does include a truely global assessment, and comes to the same conclusion. We additionally specify that "unprecentened" holds for the second half of the 20th century.
6177	4	19	29	0		Replace semi-colon with a full stop [Nina Hunter, South Africa]	taken into account - sentence was rephrased
26111	4	19	29	19	29	long-term may be misleading (esp in comparison to the time scales covered in the preceeding sections. Can you give the time series. [Regine Hock, United States of America]	taken into account - sentence was rephrased
16501	4	19	36	19	36	"Pfeffer et al": please harmonize with Chapter 2.2.3 where "RGI" is used [Georg Kaser, Austria]	taken into account - reference to Pfeffer et al. (or RGI) is no longer included here since the section was shortened
6179	4	19	39	0		"present" should be "presents" [Nina Hunter, South Africa]	taken into account - "present" is correct, since the reference was corrected to Zemp et al.
11091	4	19	39	0		Why rely so heavily on a paper that is in review? [Valentina R. Barletta, Denmark]	taken into account - we now include other (also recent) publications in the assessment
15599	4	19	39	0		This section relies heavily on a paper that is still under review. This part shouldbe reconsidered. [EUCE, Belgium]	taken into account - we now include other (also recent) publications in the assessment
19857	4	19	41	19	42	"Their results indicate.....particularly in the beginning of the 21st century" by how much? Is the result significant? If it is not, then these two statement can be removed. [APECS Group Review, Germany]	taken into account - the significance of the differences is hard to quantify because of the different methods of uncertainty estimation in the different publications; a detailed analysis is not possible here, and we refer the reader to Sect. 2.2.3 and 3.3.2 for more (regional) details
19849	4	19	42	19	42	Citation suggestion very important that review current state of glacier observation: Marzeion et al., 2017, Observation-Based Estimates of Global Glacier Mass Change and Its Contribution to Sea-Level Change, Surveys in Geophysics, https://doi.org/10.1007/s10712-016-9394-y [APECS Group Review, Germany]	rejected: there are several new studies published now that supercede Marzeion et al. (2017) and which are assessed instead (most notably on the global scale: Bamber et al., 2018), plus others at regional scales which are included in Ch 2 and 3
4713	4	19	46	0		Is it possible to explain briefly how a gravimeter can distinguish between the mass of solid earth, land hydrology and glaciers? It is mentioned here only as a source of uncertainty. [Debra Roberts and Durban Team, South Africa]	text has been reformulated
19859	4	19	47	19	47	"spatially heterogenous distribution". Reference please. [APECS Group Review, Germany]	taken into account - this part of the sentence was deleted

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19851	4	19	56	20	2	The sentence: “Because global estimates of glacier mass change are necessary for quantifying their contribution to sea level rise, …”, could be eliminated since it is already mentioned in the first paragraph of the section (See line 20). A suggestion for this part could be: “Because of the relatively high uncertainty of estimates based on gravimetry, particularly in vicinity to the ice sheets, we rely on the results of Zemp (in review) to estimate the glaciers contribution to sea level change for the second half of the 20th century, and Marzeion et al. (2015) for the entire 20th century (Table 4.1). See Sections 2.2.3 and 3.3.2 for more details.” [APECS Group Review, Germany]	taken into account - the sentence was rephrased
11093	4	20	1	0		Why rely so heavily on a paper that is in review? [Valentina R. Barletta, Denmark]	taken into account - the sentence was rephrased
15601	4	20	1	0		This section relies heavily on a paper that is still under review. This part shouldbe reconsidered. [EUCE, Belgium]	taken into account - we now base our assessment on several studies
16343	4	20	2	20	2	As done for thermal expansion and the other SLR drivers presented in the following subsections, it would be very helpful to provide contribution estimates in the text as well, not only in Table 4.1. Please add. [Alexander Nauels, Germany]	rejected - for reasons of brevity, the numbers should appear only once, and are better accesible in the table. We also want to avoid duplication with the glacier sections in Ch 2 and 3.
19861	4	20	4	20	5	In the part where the author says: “While the agreement between observational estimates of glaciers’ mass changes (in particular in the first half of the 20th century) has increased since AR5,”… It is not clear to me how this agreement has increased or to what agreement the author is referring. Maybe the author is referring to an agreement between observations and models? Or observation estimates from table 4.1 with estimates in AR5 (Table 13.1)? [APECS Group Review, Germany]	accepted - we now specify that the agreement between different observational estimates is increased since AR5
26113	4	20	4	20	8	This can be substantially be shortened avoiding the repetition [Regine Hock, United States of America]	accepted - sentence was shortened
2559	4	20	7	20	7	Models cannot be validated (they are by design an approximation of reality); they can be evaluated. [Michiel Van den Broeke, Netherlands]	accepted - text changed accordingly
31187	4	20	10	0		Please clearly state the key findings of this section, incl. confidence levels [Hans-Otto Poertner and WGII TSU, Germany]	Now this section build on section 3.3.1 from Chapter 3. Only the key findings from Chap 3 are recalled here
2493	4	20	10	21	7	There is no discussion of the overlap of the ice sheet estimates and the galcier estimates to avoid double counting. [John Church, Australia]	This issue is clarified in Table 4.1

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28397	4	20	10	21	7	A lot of overlap with chapter 3 in this section but presented in a different way that is not always consistent with Ch3, which covers contemporary ice sheet mass balance in a lot of detail. Quite a lot of typos and statements that aren't entirely correct. E.g. see Wouters et al 2013 10.1038/ngeo1874, doi:10.1038/ngeo1874 for whether an accelaration is statistically significant and how long the record needs to be. Citations are not always the most appropriately used here (e.g. McMillan and Enderlin for accel). Don't have time to go through all the points. What is meant by "climate model estimates of the 20th C ice sheet dynamics"? Does that mean a coupled ice-sheet AOGCM or..? There are ice model runs that have been forced with 20th C climate....etc etc. [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	Now this section build on section 3.3.1 from Chapter 3. Only the key findings from Chap 3 are recalled here
30015	4	20	11	20	43	A lot of this is already discussed in greater detail in Chapter 3.3.1. This part could hence be shortened and the reader referred to the corresponding sections in Chapter 3. [Ronja Reese, Germany]	accepted and corrected
6181	4	20	12	0		Insert "the" before "pre-satellite" [Nina Hunter, South Africa]	accepted and corrected
6183	4	20	13	20	14	Insert "the contribution of the" before "Greenland" and remove "contribution" after "ice sheet" [Nina Hunter, South Africa]	accepted and corrected
24477	4	20	14	20	21	This section presents the same information as in section 3.A.3.1, page 3- 168. [Eef van Dongen, Switzerland]	Now this section build on section 3.3.1 from Chapter 3. Only the key findings from Chap 3 are recalled here
6185	4	20	15	0		Take extra "p" out of "developped" [Nina Hunter, South Africa]	accepted and corrected
2571	4	20	15	20	15	Typo: developed [Michiel Van den Broeke, Netherlands]	accepted and corrected
25737	4	20	15	20	15	developped to be changed as developed [Government of India, India]	accepted and corrected
16539	4	20	17	20	18	The following statement needs rewording. "The input–output method combines measurements of ice flow velocities estimated from satellite (Synthetic aperture radar or optical imagery) across key outlets with estimates of net surface balance derived from ice thickness data". Should be net surface mass balance not net surface balance. Also, estimates of surface mass balance are not usually obtained from thickness data. Rather they are obtained from regional climate models, or from interpolation of ice core data. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	This part has been removed
6187	4	20	19	0		Remove semi-colon after "data" and replace with full stop for consistency [Nina Hunter, South Africa]	This part has been removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2561	4	20	19	20	19	Description inaccurate. The input output method (preferably called the component method) compares solid ice discharge over the grounding line (uisng remotely-sensed ice velocity and ice thickness) and surface mass balance, using (calibrated) regional climate model fields or interpolated SMB observations. [Michiel Van den Broeke, Netherlands]	This part has been removed
6189	4	20	20	0		"space" should start with a capital for consistency; change "estimate" to "estimates" [Nina Hunter, South Africa]	This part has been removed
2573	4	20	22	20	22	Contribution: to what [Michiel Van den Broeke, Netherlands]	This part has been removed
2163	4	20	24	20	24	"technics" [Robert Kopp, United States of America]	This part has been removed
2563	4	20	24	20	24	technics -> techniques [Michiel Van den Broeke, Netherlands]	This part has been removed
26115	4	20	24	20	25	delee 'Greenland and Antarctica' (so that sentence makes sense) [Regine Hock, United States of America]	This part has been removed
2575	4	20	25	20	25	remove "Greenland and Antarctica" [Michiel Van den Broeke, Netherlands]	This part has been removed
410	4	20	26	20	26	Chapter 4, page 4-20, line 26, Imbie is an acronym, so it should be written as “the IMBIE team”. [Ernst Schrama, Netherlands]	This part has been removed
19863	4	20	26	20	26	Suggestion to move the words “corresponding respectively” to: “… and 148 ± 44 Gt yr–1 for Antarctica (The Imbie team, 2018), respectively, corresponding to a global mean sea….” [APECS Group Review, Germany]	This part has been removed
30011	4	20	28	20	33	These two sentences seem to contradict each other (Greenland mass loss was abated and at the same time accelerates). [Ronja Reese, Germany]	This part has been removed
2565	4	20	30	20	31	"…a swing between extreme melting and accumulation events from 2012 to 2013–2014 (Tedesco et al., 2016) is consistent with large recorded mass loss followed by a temporary abatement." This is a funny sentence. Better: "…years with extreme mass loss owing to melt and runoff (such as 2012) can be followed by years with very little mass loss (e.g. 2013 and 2018), depending on the prevailing atmospheric circulation (see Chapter 3)." [Michiel Van den Broeke, Netherlands]	This part has been removed
27527	4	20	32	20	33	I think this is also supported by the paper indicated on line 21 where we show modelled SMB, GRACE and altimetry all reinforce this [Ruth Mottram, Denmark]	This part has been removed
2567	4	20	35	20	36	warming ocean temperatures -> increasing ocean temperatures OR warming ocean water [Michiel Van den Broeke, Netherlands]	This part has been removed
16541	4	20	35	20	36	Rignot et al 2014 point to an 'increase in ocean heat flux' as a potential cause of ungrounding ice plains, not specifically to warming ocean temperatures. [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	This part has been removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
30013	4	20	35	20	36	It's not warming ocean temperatures that cause the increased melting, but changes in ocean circulations that allow warmer ocean water masses to access the ice shelf cavities (see e.g., Jenkins et al., 2016, Oceanography, Decadal Ocean Forcing and Antarctic Ice Sheet Response: Lessons from the Amundsen Sea) [Ronja Reese, Germany]	This part has been removed
19865	4	20	39	20	40	"the largest uncertainty in trend….. In the GIA correction" This sentence has already been mentioned once on line 14, page 4-19. Please remove. [APECS Group Review, Germany]	This part has been removed
25221	4	20	40	20	41	This is also the region where the greatest increases in SMB have been observed during the 20th century (Thomas et al., GRL 2015; Thomas et al., Climate of the Past 2017; Medley and Thomas, Nature Climate Change, 2019). SMB in the Antarctic Peninsula was 123 +/- 44 Gt per year higher during the first decade of the 21st century compared to the first decade of the 19th century. [Elizabeth Thomas, United Kingdom (of Great Britain and Northern Ireland)]	This part has been removed
15665	4	20	41	20	43	East Antarctica signal not small: doi: 10.1038/d41586-018-07714-1 [EUCE, Belgium]	This part has been removed
19867	4	20	42	20	43	While I agree that mass loss in Antarctica has accelerated over the last 10 years from my research in the field, I do not see any "evidence" in this paragraph. I believe the author based this statement on the statement written on line 27-28.Other than that, all other information shown in this paragraph tells the amount of mass loss (Gt yr-1) and level of rise in sea level (mm yr-1). But as far as I can see, the value 0.42mm yr-1 for Antarctica hasn't changed (unless you consider the +0.7mm yr-1 value by Cazenave, even then you have to consider that it varies from -0.4 to +0.7mm yr-1). Therefore, how can you confirm that the mass loss of Antarctic ACCELERATED over the past 10 years? [APECS Group Review, Germany]	This part has been removed
30017	4	20	45	20	45	I do not understand this sentence, shouldn't the ice sheet models provide such estimates? If you mean coupled models, please specify. [Ronja Reese, Germany]	The whole paragraph has been removed and its content has been integrated in chap 3
2569	4	20	45	20	46	Awkward formulation [Michiel Van den Broeke, Netherlands]	The whole paragraph has been removed and its content has been integrated in chap 3
26117	4	20	45	20	46	Sentence is unclear. Climate models don’t model ice flow? I understand what you mean but it could be formulated clearer. [Regine Hock, United States of America]	The whole paragraph has been removed and its content has been integrated in chap 3

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2577	4	20	46	20	48	"…Modeled changes in Antarctica and Greenland SMB are obtained from regional climate models or downscaled global climate models. " This is inaccurate, because regional climate models represent downscaled global climate models. This section is about hindcasting ice sheet SMB, so deals with realistic reconstruction of weather. The only products available for that are re-analyses and regional climate models forced by re-analyses (dynamical downscaling), potentially using further statistical downscaling. It is important to note here that these atmospheric reanalyses are only reliable back to 1957/58 in the NH (i.e. Greenland) and 1979 for the SH (i.e. Antarctica). Any statements about SMB variability before these dates are highly uncertain, for a review for Greenland see e.g. Van den Broeke and others (2017, Current Climate Change Reports). All in all, this paragraph is not as accurate as it could be and with important references missing, and must be critically assessed and rewritten where necessary. [Michiel Van den Broeke, Netherlands]	The whole paragraph has been removed and its content has been integrated in chap 3

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27529	4	20	47	20	52	See comment on lines 18,("As most of the SMB (surface mass balance) values reported on in the report as a whole are from regional climate models, I think it is worth adding a sentence here if possible pointing out their use in this context beyond ESMs or global climate models. This is maybe especially so since all three main RCMs (MAR, RACMO, HIRHAM) use external but well developed snowpack/firn models forced by the RCM output to get accurate estimates of runoff from the ice sheets and these firn models") 19 ("Reanalysis products are really important for forcing regional climate models in order to derive SMB - it may be worth pointing this out and also that in the Arctic they don't always agree very well which can give differences in modelled SMB. See for example Akperov et al., 2018"), 25 ("Herman et al., 2018, 10.1029/2017JF004408 showed that some of the uncertainties mentioned here may actually come from model schemes that tend to overestimate precipitation at the ice sheet margin, which in turn suppresses melt rates in summer due to a lack of albedo feedbacks. In addition, the analysis in the Mottram et al submitted paper shows that performance of RCM produced SMB compares well overall with GRACE gravimetric balance but there are some significant regional discrepancies. A model that performs well with observations in one area may not perform as well elsewhere. In addition, the effect of albedo schemes is important. Significant improvement in HIRHAM SMB is given by assimilating observed albedo from MODIS and albedo is still the largest uncertainty in calculating melt rates. ") here. There are some important regional uncertainties in SMB derived from models that are not well studied and may well have an influence on the fuure of the Greenland ice sheet. [Ruth Mottram, Denmark]	The whole paragraph has been removed and its content has been integrated in chap 3
25223	4	20	50	20	51	This needs updating as there is now observational records of total Antarctic SMB since 1800 AD (Thomas et al., Climate of the Past 2017). [Elizabeth Thomas, United Kingdom (of Great Britain and Northern Ireland)]	The whole paragraph has been removed and its content has been integrated in chap 3
25273	4	20	50	20	51	Machguth et al, 2016, (doi: 10.1017/jog.2016.75) contains ~3000 SMB measurements from 46 sites in Greenland spanning 123 years from 1892-2015. From what I understand it is currently being incorpurated into SMB-models, e.g. RACMO, MAR, etc. [Kristian K. Kjeldsen, Denmark]	The whole paragraph has been removed and its content has been integrated in chap 3
16543	4	20	50	20	52	"There are no direct observational time series of Greenland and Antarctica SMB over the 20th century." How about the study by Thomas et al 2017, discussed in chapter 3? [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	The whole paragraph has been removed and its content has been integrated in chap 3
6191	4	20	51	0		Change "estimate" to "estimates" [Nina Hunter, South Africa]	The whole paragraph has been removed and its content has been integrated in chap 3

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19869	4	20	52	20	53	I think too much information is confined into Table 4.1.It would be awesome if the author could separate the information into separate tables i.e. Tbale 4.2, 4.2a, 4.21 etc....Too much information in a single table would lead to information fatigue syndrome for the readers. [APECS Group Review, Germany]	Unfortunately we do not have enough room in this chapter to breakdown table 4.1 into several tables and explain each detail. In effect this whole paragrpah has been moved to chap 3. The reviewer is invited to read chap 3 to get the level of details he asks for
27531	4	20	52	21	7	The paper by Mottram et al., 2017 (Low tem sci: 10.14943/lowtemsci.) compares RCM downscaled SMB forced with historical simulation from EC-Earth. The GCM is somewhat too cold at the present day so SMB from the HIRHAM climate model is higher than when forced with the ERA-Interim reanalysis. However the model also produces less precipitation which modulates the effect. It might be important to state therefore that uncertainties in the components of the SMB can be masked by looking at the integrated number. The RCM shows a steep increase in melt as well as a smaller increase in precip in both RCP4.5 and 8.5 by the end of the century when forced with scenario runs from the same GCM. [Ruth Mottram, Denmark]	The whole paragraph has been removed and its content has been integrated in chap 3
6193	4	20	54	20	56	"reanalyses-based" vs "reanalysis-based" - suggest the latter is correct. Please apply consistently [Nina Hunter, South Africa]	The whole paragraph has been removed and its content has been integrated in chap 3
19871	4	20	55	21	2	For this part, I strongly encourage the author to include some graphs from cited literature to help readers to visualize the statement. For example, Figure 8 from the cited reference Fettweiss et al. 2017 could be very useful for readers. [APECS Group Review, Germany]	Unfortunately we do not have enough room in this chapter to get into this kind of details. In effect this whole paragrpah has been moved to chap 3. The reviewer is invited to read chap 3 to get the level of details he asks for
6195	4	20	57	0		Please state what "it" is for clarity [Nina Hunter, South Africa]	The whole paragraph has been removed and its content has been integrated in chap 3
25275	4	21	1	21	1	Bjørk et al,nat Cli Cha 2018, also showed significant retreat of glaciers in central east Greenland. (Doi: 10.1038/s41558-017-0029-1) [Kristian K. Kjeldsen, Denmark]	The whole paragraph has been removed and its content has been integrated in chap 3
19875	4	21	2	21	3	Delete "that is not supposed to be captured by climate models". The spread of climate model simulations do capture the internal climate variability. [APECS Group Review, Germany]	The whole paragraph has been removed and its content has been integrated in chap 3
19877	4	21	2	21	3	I dont think "that is not supposed to be captured by the climate models" could lend any credibility to the accuracy of climate models. I suggest modifying the statement to: " This difference may be due to the internal climate variability captured by the climate models, or...." [APECS Group Review, Germany]	The whole paragraph has been removed and its content has been integrated in chap 3
5383	4	21	4	21	4	I suggest to cite also Hanna et al. (2018) here. [Xavier Fettweis, Belgium]	The whole paragraph has been removed and its content has been integrated in chap 3
6197	4	21	4	21	5	"reanalyses-based" vs "reanalysis-based" - suggest the latter is correct. Please apply consistently [Nina Hunter, South Africa]	The whole paragraph has been removed and its content has been integrated in chap 3

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
30019	4	21	4	21	7	How does this fit with the recent publication by Medley & Thomas, Nature Climate Change, 2019, “Increased snowfall over the Antarctic Ice Sheet mitigated twentieth-century sea-level rise”? [Ronja Reese, Germany]	The whole paragraph has been removed and its content has been integrated in chap 3
19879	4	21	5	21	5	"Favier et al., 2017" Bromwich et al 2011 paper on the precipitation estimates from different reanalysis datasets would be a better reference. (An Assessment of Precipitation Changes over Antarctica and the Southern Ocean since 1989 in Contemporary Global Reanalyses). The fact that reanalysis based estimates are reliable since 1979 has been known much earlier than 2017. [APECS Group Review, Germany]	The whole paragraph has been removed and its content has been integrated in chap 3
19887	4	21	9	21	25	One reference in particular is used many times (6 out of 13). [APECS Group Review, Germany]	we removed it in three places to get a more balanced picture
11097	4	21	26	0		Can actually “GRACE” and global hydrological modeling determine Net land water storage changes? (at which spatial scale?). And why stress “driven by both climate and direct human intervention”? GRACE cannot distinguish among them, so it must be something in the model. But is it relevant in this section 4.2.2. “Observed changes in Sea Level (Past and Present), to keep stressing the origin of the contributions? Especially when the final claim Line 35-36) in “Low confidence”? [Valentina R. Barletta, Denmark]	we don’t claim to separate we only want to show off that it is not only climate driven changes observed in GRACE but also changes driven by human intervention. Scale is at the typical GRACE scale and typical GCM scale
15603	4	21	26	0		Can actually “GRACE” and global hydrological modeling determine Net land water storage changes? (at which spatial scale?). And why stress “driven by both climate and direct human intervention”? GRACE cannot distinguish among them, so it must be something in the model. Moreover, is it relevant to highlight the source of the contributionsin the section 4.2.2. “Observed changes in Sea Level (Past and Present)? Especially in view of the conclusive claim, in Lines 35-36, which says “Low confidence”. [EUCE, Belgium]	see previous comment
19881	4	21	27	21	27	"by both climate and…" since it has mentioned above that the changes are driven by climate variability, it is imperative to clarify here that it is climate variability, lest the readers confuse it as "climate change". [APECS Group Review, Germany]	on purpose we use climate and direct human interventions to distinguish between direct groundwater pumping and what is related to climate change, which might be both been related to change and variability
22005	4	21	28	21	28	What is the rate of sea level? [David Schoeman, Australia]	the buget is discussed in the next paragraph
9161	4	21	28	21	30	Consider adding a reference. [Angelique Melet, France]	Reference to scanlon is given a few sentences later
11095	4	21	29	0		Is TWS defined? Is there an acronym table? [Valentina R. Barletta, Denmark]	this term is abandoned
15605	4	21	29	0		Please, define TWS. [EUCE, Belgium]	this term is abandoned
19883	4	21	29	21	29	I think TWS abbreviation has not been defined anywhere in the text. [APECS Group Review, Germany]	this term is abandoned

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6199	4	21	31	0		Suggest remove "also" from line 31 and insert before "identified" [Nina Hunter, South Africa]	accepted and changed
19885	4	21	31	21	32	Include the number for the "negative contribution of land water storage" and "slightly positive one". [APECS Group Review, Germany]	accepted and changed
6201	4	21	36	0		Should "in" not replace "on"? [Nina Hunter, South Africa]	accepted and changed
6203	4	21	41	0		Insert "the" before "20th" [Nina Hunter, South Africa]	accepted and corrected
27001	4	21	45	21	46	In particular, there was the hiatus, not simulated by models and maybe unforced. That could produce a discrepancy between models and obs. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	accepted. The comment is included now
19873	4	21	48	21	49	Add reference to the values in Table 4.1, after sentence: “This can explain part of the discrepancy between the observed and the model GMSL rise budget over this period.” [APECS Group Review, Germany]	accepted and corrected
6205	4	21	51	0		Change "variation" to "variations" [Nina Hunter, South Africa]	accepted and corrected
6207	4	21	52	0		Replace "few" with "little" [Nina Hunter, South Africa]	accepted and corrected
32323	4	21	52	21	53	The few literature [sic] . . . unsignificant [insignificant] [Donald Boesch, United States of America]	accepted and corrected
22075	4	22	2	22	2	" consistent within uncertainties" : yes but there are very large uncertainties for each of the components and the total as well. It would be good to show relative uncertainties here to illustrate that fact. [Julia Pfeffer, Australia]	We can not answer to this comment because what is meant by "relative uncertainty" is not clear.
22077	4	22	5	22	5	Not only extend observations, altimetry observations were also corrected for a drift in the TOPEX orbit that was identified after the AR5. [Julia Pfeffer, Australia]	accepted and corrected
26999	4	22	8	22	8	Also Yi et al 2017 10.1002/2017GL076129 [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	accepted and corrected
22079	4	22	8	22	10	Relevance of that information given the short time period (10 years only)? [Julia Pfeffer, Australia]	We have evidences of an increasing contribution from glaciers and ice sheets to sea level rise for more than 25 years now (see for example table 4.1). We expect in the future the contribution from glaciers and ice sheets to dominate over the thermal expansion. This is now observed since about 10 years. Because Glaciers and ice sheet dynamics show very small interannual to decadal variability compared to their long term trend there is good reason to think that the recent dominance of the glacier and ice sheet contribution over the thermal contribution in sea level rise may continue in the futur.This is relevant for projections .
22081	4	22	10	22	13	Unclear, please consider to reformulate. [Julia Pfeffer, Australia]	accepted and reformulated
17685	4	22	16	22	16	needs to be GMSL not sea level since these values only apply to GMSL [Matt King, Australia]	accepted and corrected
22083	4	22	16	22	16	Where does the estimate of 0.5 mm/yr on 10 years time scales come from? [Julia Pfeffer, Australia]	from The WCRP sea level budget group 2018. This is now indicated
6209	4	22	17	0		Change "is" to "are" [Nina Hunter, South Africa]	accepted and corrected
22085	4	22	20	22	22	Where does the estimate of a few mm/yr come from? It seems optimistic given the large uncertainties that we have. [Julia Pfeffer, Australia]	from The WCRP sea level budget group 2018. This is now indicated
6211	4	22	21	0		Change "tenth" to "tenths"; insert "a" before "mm" [Nina Hunter, South Africa]	accepted and corrected

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
12081	4	22	24	22	25	There are inconsistencies in the time points in the report, such as the starting year of the changing heat content and the corresponding steric sea level in 1971 (AR5, chapter-5) or in 1970 (SPM, chapter-4). Please keep consistent throughout SROCC. At the same time, please also ensure the numerical consistency between the changing heat content (chapter-5) and the changing steric sea level (chapter-4) that are being assessed. [Government of China, China]	At the time of answering this review we are making an effort to keep as consistent as possible through out the SROCC report
19889	4	22	24	22	27	Suggestion of references: Parkes, 2018, https://www.nature.com/articles/s41586-018-0687-9, and Slangen, 2017, https://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-17-0110.1, and Meyssignac, 2017, https://journals.ametsoc.org/doi/10.1175/JCLI-D-17-0112.1. [APECS Group Review, Germany]	accepted and corrected
27003	4	22	26	22	26	You have a larger discrepancy for 1901-1990 than the AR5 did. Would you like to comment on why this is? [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	Now we comment aand explain this discrepancy
10851	4	22	27	22	29	Two time periods, 1971-2015 and 1970-2015 are used here. Is this intentional or a typo? [Ola Kalén, Sweden]	accepted and corrected
23733	4	22	27	22	29	Two slightly different time periods, 1971-2015 and 1970-2015 are used here. Is this intentional or a typo? [Government of Sweden, Sweden]	accepted and corrected
6213	4	22	30	0		Add apostrophe to "glaciers" to indicate that it is plural; change "results" to singular [Nina Hunter, South Africa]	accepted and corrected
26121	4	22	37	22	42	It is unclear which time period this refers to. Seems like these numbers are only based on Mareion and Noel etc. Needs clarification. [Regine Hock, United States of America]	accepted and corrected
6215	4	22	38	0		Suggest removing 'and more" and inserting a comma in this place and remove "more" from before "comprehensive" [Nina Hunter, South Africa]	accepted and corrected
6217	4	22	39	0		Remove "from" [Nina Hunter, South Africa]	accepted and corrected
28599	4	22	39	22	41	I note a recently published article by Parkes and Marzeion (quoted lated in this chapter as 'in press') that revises the 20th century sea-level contribution from 'unmapped' glaciers and hence allows closure of the 20th century sea-level budget. Reference to this more recent article should probably be included here. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	reference added
6219	4	22	45	0		Insert "a" before "recent" [Nina Hunter, South Africa]	accepted and corrected
19891	4	22	46	22	48	Add reference to Figure 4.3 for a better understanding, after sentence: “When all the new estimated contributions are combined together, there is a gap between observations (mean of the five tide gauge reconstructions, see Section 4.2.2.2.1) and climate models before 1990.” [APECS Group Review, Germany]	accepted and corrected

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22087	4	22	52	22	56	How is the bias corrected? What is the impact of this correction on the reliability of models and observations? [Julia Pfeffer, Australia]	The bias in glaciers and GrIS contribution is corrected by comparison of the climate model based estimate with atmospheric reanalyses based estimates. We refer now to Slangen et al. 2017 for more details on the consequences: Slangen, A.B., B. Meyssignac, C. Agosta, N. Champollion, J.A. Church, X. Fettweis, S.R. Ligtenberg, B. Marzeion, A. Melet, M.D. Palmer, K. Richter, C.D. Roberts, and G. Spada, 2017: Evaluating Model Simulations of Twentieth-Century Sea Level Rise. Part I: Global Mean Sea Level Change. J. Climate, 30, 8539–8563, https://doi.org/10.1175/JCLI-D-17-0110.1
3007	4	22	54	22	56	This section is very clear and interesting. Here, the reader may just wonder why this results does not give higher confidence to GMSL reconstructions obtained by Hay et al 2015 and Dangendorf et al 2017 (see subsection 4.2.2.2.1), and why past GMSL estimates have been enlarged compared to AR5 and not shifted upwards. I note that the authors mention potential biais (Hamlington and Thompson, 2015) in section 4,2,2,2,1 to justify this choice and I wonder if a link to section 4,2,2,2,1 should be made here to make clear that the whole is fully consistent. [Goneri Le Cozannet, France]	The link is made now
19893	4	22	54	22	56	Add reference to Figure 4.3 (e.g. green and yellow line in Figure 4.3) for a better understanding, after sentence: “Compared to the individual reconstructions, the bias-corrected simulations agree best with the Dangendorf et al. (2017) and Hay et al. (2015) reconstructions (green and yellow line in Figure 4.3), explaining 92% of the observed change in these cases.” [APECS Group Review, Germany]	accepted and corrected
4719	4	23	0	0		Table 4.1: what are the units? What are the units of Global Mean Sea Level (row 1)? In relation to what? [Debra Roberts and Durban Team, South Africa]	accepted. The units are now given in the caption
28601	4	23	0	0		Please confirm the units for all values in Table 4.1. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	accepted. The units are now given in the caption
28603	4	23	0	0		In Table 4.1 please make it clear whether the 'total contributions' value for 2005-2015 (final column, row 9 of the table) reflects the sum of the thermal expansion and individual mass components (i.e. rows 2 to 7), or the sum of the thermal expansion and ocean mass components (i.e. rows 2 and 8). [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	This is clarified now with a footnote
23195	4	23	0	23		Missing units. [Valerie Masson-Delmotte, France]	accepted. The units are now given in the caption
9163	4	23	0	24		Table 4.1. Units are missing in the table legend (mm/yr) [Angelique Melet, France]	accepted. The units are now given in the caption

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17717	4	23	0	24		Consider adding Box et al (2018) SLR estimates from Greenland and non-Greenland glaciated areas to table, especially for 2005-2015 period. These could supplement, or supplant, the existing Greenland SMB reference. Also be sure to clearly add units within the table. Reference to Box et al (2018) --> Box, J.E., W.T. Colgan, B. Wouters, D.O. Burgess, S. O'Neel, L.I. Thomson, S.H. Mernild 2018. Global sea-level contribution from Arctic land ice: 1971–2017, Environmental Research Letters. [Thomas Ballinger, United States of America]	In the final version of the report, Table 4.1 numbers for the Greenland contribution are coming from the assessment of chapter 3 on polar ice regions. In this chapter they did include Box et al. 2018 in their assessment. Units are now indicated in the legend
4717	4	23	1	0		102 of what is explained? What are the units? [Debra Roberts and Durban Team, South Africa]	102% of the observed sea level rise. We add the symbol '%' after 102 to clarify
22089	4	23	7	23	8	" There is good agreement … contributions to sea level": Previous liteerature assessement and Table 4.1 do not really support this statement. Historical observations are not directly comparable with models and both are affected by large uncertainties. [Julia Pfeffer, Australia]	When the agreement is within error bars that are reasonnably small compared to the signal observed, we consider that the agreement is "good". The previous IPCC assessment (AR5) already got to the conclusion that the agreement between observed GMSL and simulated GMSL was good after 1960. On the basis of the improved model simulations, the improved observations and the improved agreement between models and observations that is available since AR5 we assess that the "good" agreement between observed GMSL and simulated GMSL after 1960 as stated in AR5 is confirmed here
6221	4	23	10	0		Change "unability" to "inability" [Nina Hunter, South Africa]	accepted and corrected
6223	4	23	11	0		Suggest replacing "elucidated" with "clear"; change "wether" to "whether" [Nina Hunter, South Africa]	accepted and corrected
25739	4	23	11	23	11	wether to be changed to whether [Government of India, India]	accepted and corrected
6225	4	23	12	0		Suggest remove "some" so it reads better [Nina Hunter, South Africa]	accepted and corrected
22091	4	23	13	23	17	the litterature do not support this statement. Uncertaities and gap are still large. Progress is made, but is not sufficient yet to draw that conclusion. [Julia Pfeffer, Australia]	When the agreement is within error bars that are reasonnably small compared to the signal observed, we consider that the agreement is "good". The previous IPCC assessment (AR5) already got to the conclusion that the agreement between observed GMSL and simulated GMSL was good after 1960. On the basis of the improved model simulations, the improved observations and the improved agreement between models and observations that is available since AR5 we assess that the "good" agreement between observed GMSL and simulated GMSL after 1960 as stated in AR5 is confirmed here
6227	4	23	14	0		Make "model" plural [Nina Hunter, South Africa]	accepted and corrected
2579	4	23	14	23	14	I disagree that global climate models with high confidence can be used to predict ice sheet and glacier SMB changes in the future. This may be true for ocean thermal expansion, but given the (very) poor representation of ice sheet and glacier SMB in many of these models, projections will be as uncertain. [Michiel Van den Broeke, Netherlands]	accepted and corrected see section 4.2.3.6
25741	4	23	14	23	14	change model to models [Government of India, India]	accepted and corrected
6229	4	23	15	0		Insert space before "But" [Nina Hunter, South Africa]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6231	4	23	17	0		Remove "time scales" after "multicentennial" as it is repetition; insert apostrophe at end of "dynamics" [Nina Hunter, South Africa]	accepted and corrected
412	4	23	23	23	23	Chapter 4, page 4-23, line 23, table 4.1, there are different notations for the confidence region definitions, I presume they are all 1 sigma regions, or are they 2 sigma in the a+/-b notation, this may confuse the reader. [Ernst Schrama, Netherlands]	We use here the standard IPCC notation defined in the "IPCC uncertainty guidance note" from Mastrandrea et al. 2010
15059	4	23	23	23	23	Units are missing for GMSL [Government of Germany, Germany]	accepted and corrected
16345	4	23	23	23	23	Please add unit to caption (mm/yr) [Alexander Nauels, Germany]	accepted and corrected
26137	4	23	23	23	23	first column: repace 'Greenland SMB+Ice discharge by 'Greenland ice sheet', same for Antarctica. All other components are mentioned as components while here the processes/partitioning is mentioned. This is confusing and also irrelevant. A reader may wonder if there are other components that are not included here if 2 components are explicitly mentined. Here the numbers refer to total mass change, i.e. naming 2 components only confuses. [Regine Hock, United States of America]	partially accepted. We need this partitionning to make clear that the model estimate (on the lower part of the table) only accounts for the SMB. To avoid the potentiel confusion you mention we now write "SMB+ice discharge" within brackets
2165	4	23	23	23	26	How are uncertainties summed across components here? What assumptions are made about dependencies? [Robert Kopp, United States of America]	Uncertainties are assumed independent. IT is clarified in the footnote now
4235	4	23	23	23	26	Please, indicate the unit of GMSL change (mm/y?, cm/y?). [Josep Ramon MEDINA, Spain]	accepted and corrected
15061	4	23	23	23	26	Table captions specifies last time period as 2006-2015, in last Table column it is given as 2005-2015. Please check [Government of Germany, Germany]	in the table caption the period 2006-2015 refers to the period over which historical simulations are extended with the RCP8.5 scenario. Within the table the period 2005-2015 refers to one of the reference periods.
19895	4	23	23	23	26	The reference period of the anomaly is missing at the table caption. [APECS Group Review, Germany]	There is no reference period in this table. It is not clear what the reviewer means with "refeence period"
28399	4	23	23	23	26	References don't seem to match the numbers in the tables: e & f wrong way round or....And where do the glacier numbers come from for all time periods except 1900-1990? etc [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	Numbers are computed from the references indicated. When the periods are different from the reference periods indicated in the reference paper then we asked to the other for the dataset and recomputed the trends over the periods indicated in table 4.1. E and f have been switched. Glaciers numbers come from the assessment in chapter 2 of the SROCC report
32325	4	23	23	23	26	Caption should provide the units of the values in the table, presumably mm yr-1. Also, isn't GMSL in the table GMSL rise [Donald Boesch, United States of America]	accepted and corrected
10499	4	23	23	24	17	Units seem to be missing from Table 4.1 - I assume all are mm/year? [James Renwick, New Zealand]	accepted and corrected
23941	4	23	23	24	17	Please describe the unit of Table 4.1. (is it mm/yr. ?) [Government of Japan, Japan]	accepted and corrected
23943	4	23	23	24	17	It would be very helpful for readers if lines and colors of Table 4.1 could be devised to make the relations between each data and observed GMSL intelligible. [Government of Japan, Japan]	Unfortunately we don't handle the form of the table ourselves. The form is made up afterwards by other people
33453	4	23	23	24	17	Add units to the table/table description. [Government of United States of America, United States of America]	accepted and corrected

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33455	4	23	23	24	26	In the caption for Table 4.1, it is not made explicit what the units are for the numbers given in the columns. Presumably, they are mm / yr ? [Government of United States of America, United States of America]	accepted and corrected
12085	4	23	23	40	49	Table 4.1 on page 23 and Tables 4.2 on page 40 should be made uniform in metric unit. [Government of China, China]	We prefer to keep mm/yr to be consitent with AR5
19897	4	23	24	23	24	I think too much information is included in Table 4.1. The author could separate the information into several different tables eg Table 4.2, Table 4.21, Table 4.2a, etc to prevent information-fatigue syndrome. [APECS Group Review, Germany]	Unfortunately we don't have enough space available in this chapter to make three tables out of table 4.1. We have to keep one unique table here
4721	4	24	0	0		Figure 4.3: - It looks like the 1990-onward graph in (a) is not exactly the same as (b), e.g. the blue area seems to be wider in (a) than in (b). Why would that be? Would recommend that the zero reference be the same in (a) and (b) so they are comparable. [Debra Roberts and Durban Team, South Africa]	accepted and corrected
1497	4	24	0	24		larger fonts to be used to improve clarity [Chandani APPADOO, Mauritius]	accepted and corrected
6233	4	24	9	24	24	Change "Glaciers" to include an apostrophe [Nina Hunter, South Africa]	accepted and corrected
6235	4	24	10	0		"include" to "includes" [Nina Hunter, South Africa]	accepted and corrected
25277	4	24	11	24	12	Bamber et al, 2018 and Kjeldsen et al, 2015 have been switched [Kristian K. Kjeldsen, Denmark]	accepted and corrected
28605	4	24	17	24	17	Ice discharge cannot have been deduced from Shepherd et al. (2012) for all periods listed in the table: the 1901-1990 period pre-dates the satellite era (the Shepherd et al. study is based on the analysis of satellite data), while the 2005-2015 period partly post-dates the Shepherd et al. study. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	accepted.We remove these numbers. In the final version of the report the numbers for ice sheet come from the assessment made in chapter 3 of the SROCC report
19899	4	24	19	24	19	Suggestion: I hope the author and editor could place Figure 4.3 further away from Table 4.1, because there has been too much text in between diagrams, and that could cause information fatigue. Since Figure 4.3 talks about sea level change by various sources, it can be placed here. Table 4.1 however, should be place higher up, preferably around page 4-16 or 4-17. [APECS Group Review, Germany]	waiting for roderik
15063	4	24	19	24	20	Why are there two shades of blue shading in Fig. 4.3, please explain in caption [Government of Germany, Germany]	This is a mistake. It is now corrected
15065	4	24	19	24	20	Please add text concerning the volcano eruptions marked in Fig. 4.3 in the caption [Government of Germany, Germany]	accepted and corrected
29921	4	24	19	24	31	no legend in the figure for panels (a) and (b) [Anna Zivian, United States of America]	accepted and corrected
3957	4	24	20	24	25	This figure needs to be of higher quality. [Aakash Sane, United States of America]	It is not clear what is meant here by "higher quality". We now generate figure 4.3 with a resolution of 300 DPI
9605	4	24	21	24	21	The panels should be labeled (a) and (b). [Government of France, France]	accepted and corrected
2167	4	24	21	24	31	Hay et al 2015 is barely visible here. [Robert Kopp, United States of America]	The colour of the Hay et al. curve is now changed
13943	4	24	21	24	31	Figure 4.3 - The text of the figure refers to '95% very likely range shaded in orange', this cannot be seen on the figure. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The colour of the orange very likely range is now changed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2973	4	24	22	28	23	I suggest to replace "5%–95% very likely range" by "5th-95th percentile levels" to ensure compliance with the uncertainties guidances of IPCC (Mastrandrea et al 2010) [Goneri Le Cozannet, France]	We use the term 5-95% uncertainty range to be consistent across the whole chapter
27009	4	24	34	26	36	This section (4.2.2.4) seems rather long to me. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	Section 4.2.2.4 is significantly reduced in the final version of the report. The reduction has been relatively more important for section 4.2.2.4 than for any other subsection within 4.2
1817	4	24	34	26	37	Page 4-24 Line 34 to 4-26 Line 37 Whilst improved model outputs post AR5 are demonstrated (Slangen et al. 2017, Meyssignac et al. 2018) within error margins to accord with broad observational estimates over generally the 20th century, the work of Watson (2018b) provides improved techniques to compare observational records and AR5 projection model outputs at the regional scale over the recent decade (from 2007-2016). This work is unique, providing a breakthrough in efficiently removing the contamination of the internal climate modes and other dynamic signals from the ensemble model outputs, prior to comparing trends. This work is not noted in the SOD. Importantly, this work concludes that whilst the observational and model-projected average velocity agree (95% confidence level), error margins are comparatively wide, masking the fact that the mean velocity for the model-projection products exceed observational records for nearly all 19 regional stations considered and Representative Concentration Pathway (RCP) experiments, with the gap likely in the range of 1.6–2.5 mm/year. The analysis might provide an early warning sign that the evaluation of ocean model components with respect to projected mean sea level could be relevantly improved through CMIP6 and beyond. This is an important alternative advancement in evaluating projection model outputs for sea level, particularly at the regional scale. References: Meyssignac, B., Slangen, A.A., Melet, A., Church, J.A., Fettweis, X., Marzeion, B., Agosta, C., Ligtenberg, S.R.M., Spada, G., Richter, K. and Palmer, M.D., 2017. Evaluating Model Simulations of Twentieth-Century Sea-Level Rise. Part II: Regional Sea-Level Changes. Journal of Climate, 30(21), pp.8565-8593. Slangen, A.B., Meyssignac, B., Agosta, C., Champollion, N., Church, J.A., Fettweis, X., Ligtenberg, S.R., Marzeion, B., Melet, A., Palmer, M.D. and Richter, K., 2017. Evaluating Model Simulations of Twentieth-Century Sea Level Rise. Part I: Global Mean Sea Level Change. Journal of Climate, 30(21), pp.8539-8563. Watson, P.J., 2018b. How Well Do AR5 Sea Surface-Height Model Projections Match Observational Rates of Sea-Level Rise at the Regional Scale? Journal of Marine Science and Engineering, 6(1), p.11. [Phil Watson, Australia]	rejected. In watson et al.2018 the authors compare rigorously tide gauge time series corrected for internal variability (as much as it is possible) with AR5 sea level projections over the overlapping decade 2007-2016. The AR5 projections are based on RCP scenarios of GHG emissions. Watson 2018 find that climate models simulated sea level agrees with tide gauge time series but the mean estimate of sea level from climate models is persistently higher than the mean tide gauge estimate.They conclude that climate model projections of sea level might be biased high. .But there is a major flaw in this article.In this paper the climate model simulation of the sea level over 2007-2016 is based on AR5 projections of sea level. These projections use the forcing derived from RCP scenario which does not contain the forcing from volcanic eruptions (e.g. Santer et al. 2014, Fyfe et al. 2013), from the variability in the background stratospheric aerosols (Solomon et al. 2011) and from the natural variability of the climate (Kosaka et al. 2013, Meehl et al. 2011, 2013, Huber and Knutti 2014). All this radiative forcing that is not included in projections is known to reduce surface temperature and ocen temperature leading to reduced sea level rise. So sea level projections from AR5 are expected to be higher than observations over the decade 2007-2017 and they are not directly comparable. But Watson 2018 do not correct for this missing forcing and it is not clear in his paper what is the real reason for the misfit between climate model projections of sea level and tide gauge time series: a bias in climate model processes or just the missing forcing in climate model projections? For this reason we do not take into account the conclusions from Watson 2018.
28607	4	24	39	0		In addition to mentioning that the addition of meltwater will impact ocean circulation (and hence cause regional variations in sea-level change), I would also expect some mention that adding meltwater to the ocean has a spatially variable 'fingerprinting' effect, related to the change in the shape of the geoid and the seafloor due to surface mass redistribution [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27005	4	24	39	24	39	The GRD effects of land ice melt aren't large in the past. If you're going to mention them, you should probably mention change in atmospheric pressure as well. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	accepted and corrected
12083	4	25	1	25	57	The existing text focuses more on the assessment of sea level changes in the Atlantic Ocean. Given that the Indian ocean has registered a rapid sea level rise since the 1990s and that the North-west Pacific is one of the regions registering the fastest sea level rise in the world, it is suggested that the report be supplemented with the assessed research advances in the Indian Ocean and the Pacific Ocean, among others, as given in the following literature: Cheng, X., S.-P. Xie, Y. Du, J. Wang, X. Chen, J. Wang (2016), Interannual-to-decadal variability and trends of sea level in the South China Sea. Climate Dynamics, OI: 10.1007/s00382-015-2756-1. 3) Cheng, X., L. Li, Y. Du, J. Wang, R.-X. Huang (2013), Mass-induced sea level change in the northwestern North Pacific and its contribution to total sea level change, Geophys. Res. Lett, 40. Li, Y., W. Han, A. Hu, G.A. Meehl, and F. Wang, 2018: Multidecadal Changes of the Upper Indian Ocean Heat Content during 1965–2016. J. Climate, 31, 7863–7884 Li, Y., W. Han, and L. Zhang, 2017: Enhanced decadal warming of the southeast Indian Ocean during the recent global surface warming slowdown. Geophys. Res. Lett., 44, 9876–9884 Du Y, Zhang Y, Feng M, Wang T, Zhang N, Wijffels SE (2015a) Decadal trends of the upper ocean salinity in the tropical Indo-Pacific since mid-1990s. Scientific Reports 5:16050. https://doi.org/10.1038/srep16050 [Government of China, China]	partially accepted. At this stage we are lacking space in the report and we are trying to reduce the amount of text. We can not add further material. So instead of adding more detailed information on the Indian ocean we opted for reducing the too much detailed information on the atlantic ocean
23717	4	25	2	25	3	The statement that sea level patterns respond to (coupled ocean-atmosphere) variability modes would seem to be too casual. Wouldn't it be more correct to view them as a part of these variability modes? [Government of Sweden, Sweden]	Sea level does not feed back on the dynamics of the ocean. As such it does not play an important role on the dynamics. It is rather a consequence of the dynamics itself (in particular in models sea level is computed as an a-posteriori diagnostic and not on the fly precisely because its impact on the dynamics is neglictible). For this reason we see sea level as a response to the dynamics rather than part of it.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10827	4	25	3	25	3	I find the statement that sea level patterns respond to variability modes to be too casual. Isn't it more correct to view them as part of these variability modes? [Magnus Hieronymus, Sweden]	Sea level does not feed back on the dynamics of the ocean. As such it does not play an important role on the dynamics. It is rather a consequence of the dynamics itself (in particular in models sea level is computed as an a-posteriori diagnostic and not on the fly precisely because its impact on the dynamics is neglictible). For this reason we see sea level as a response to the dynamics rather than part of it.
2495	4	25	4	0		Add Zhang and Church GRL 2012. [John Church, Australia]	rejected: in this report we are supposed to review the new litterature since AR5. Zhang and Church 2012 is prior to AR5. We focus here on more recent research
19901	4	25	4	25	4	Acronyms NAO and SAM are not full written and PDO is explicit only later in the text. [APECS Group Review, Germany]	accepted and corrected
22093	4	25	5	25	5	Pfeffer et al., 2018 also showed strong influences of the Atlantic Multidecadal oscillation (AMO), the north Pacific Gyre Oscillation (NPGO) , the indian Dipole (IOD) and the Indian Ocean Basin Mode (IOBM) on steric sea level changes. Refrence: Pfeffer, J., Tregoning, P., Purcell, A., & Sambridge, M. (2018). Multitechnique Assessment of the Interannual to Multidecadal Variability in Steric Sea Levels: A Comparative Analysis of Climate Mode Fingerprints. Journal of Climate, 31(18), 7583-7597. [Julia Pfeffer, Australia]	accepted and corrected
4723	4	25	8	0		What is the "steric sea level"? [Debra Roberts and Durban Team, South Africa]	the term steric has been removed
3959	4	25	8	25	10	Citation needed for sentence from line number 8 to 10. [Aakash Sane, United States of America]	references are given at the end of the next sentence. They apply to lines 8 to 12
27007	4	25	9	25	9	I think what you mean here by "effect of mass redistribution" is not GRD (gravitation, rotational deformation), but you are referring to the alternative separation of local RSL change into a density and a mass part, within a column. Because of this confusion, Gregory et al (terminology paper) recommend the term "manometric" for the mass part, opposed to "steric" for the density part. However, I would question whether this really helps to understand here. The movement of mass onto the shelves is a consequence of ocean dynamics, which tends to reduce the gradient in ocean dynamic sea level change. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	We clarified what we mean here by calling it "dynamical mass redistribution". We prefer this term here to the term "manometric" as it is more self explanatory for non-specialist and we don't have enough space left to introduce the new concept of manometric sea level
6237	4	25	11	0		Please replace "like" with "such as" [Nina Hunter, South Africa]	accepted and corrected
3681	4	25	11	25	12	Salinity is not the most significant influence in the Southern Ocean, so it is recommended to supplement the estuary area. [Juncheng Zuo, China]	This sentence is now removed
6239	4	25	12	0		Insert "the" before "North" [Nina Hunter, South Africa]	This sentence is now removed
19903	4	25	13	25	13	Please write "in surface wind stress particular in the tropics" instead. [APECS Group Review, Germany]	accepted and corrected
6241	4	25	15	0		Move "also" to before "play" [Nina Hunter, South Africa]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19905	4	25	15	25	15	"play also a role in in generating variability in steric sea level," [APECS Group Review, Germany]	accepted and corrected
1687	4	25	22	25	31	Some more context for these patterns of internal variability would be useful, i.e., how frequently do these oscillations occur and what changes as a result of these modes lead to changes in sea level rise? [Nora Richter, United States of America]	rejected. Unfortunateley we don't have enough space left to enter this level of details in this chapter. We refer the reviewer to chapter 5 of the SROCC report for more details
5035	4	25	23	25	23	Drop "NPGO" as the acronym is not used anywhere else in the chapter [Debra Roberts and Durban Team, South Africa]	accepted and corrected
2497	4	25	24	0		Add Zhang and Church GRL 2012. [John Church, Australia]	rejected: in this report we are supposed to review the new litterature since AR5. Zhang and Church 2012 is prior to AR5. We focus here on more recent research
2499	4	25	28	0		Add Zhang and Church GRL 2012. [John Church, Australia]	rejected: in this report we are supposed to review the new litterature since AR5. Zhang and Church 2012 is prior to AR5. We focus here on more recent research
6243	4	25	30	0		Move "also" to before "contributes" [Nina Hunter, South Africa]	accepted and corrected
4725	4	25	33	0		Excessive use of the word 'the' in this section. Many instances can be deleted to improve the flow of the wording. [Debra Roberts and Durban Team, South Africa]	a significant part of this section has been removed, removing at the same time the excessive use of the word "the"
3683	4	25	33	25	56	It is recommended to supplement the assessment of the impact of melting ice in Greenland and the Arctic Ocean on AMOC. [Juncheng Zuo, China]	This section was too long and we removed a significant part of it as the material was not essential for the rest of the chapter. Thus We could not add the supplementary information asked by the reviewer
6245	4	25	34	0		Replace "to" with "with" [Nina Hunter, South Africa]	accepted and corrected
6247	4	25	36	0		"mechanisms" - add in an "h"; replace "to" with "with"; change "induced" to "induce" [Nina Hunter, South Africa]	accepted and corrected
414	4	25	36	25	36	Chapter 4, page 4-25, line 36, replace “mecanisms” by “mechanisms” [Ernst Schrama, Netherlands]	accepted and corrected
25743	4	25	36	25	36	mecainsms to mechanisms; induced to induce [Government of India, India]	accepted and corrected
6249	4	25	38	0		Replace "of" with "for" [Nina Hunter, South Africa]	this part has been removed
24381	4	25	42	25	47	Calafat et al. (2018) - Nat Comm 10.1038/s41467-018-04898-y: show that the interannual variations in the sea level annual cycle are associated with incident Rossby Waves on the western boundary of the North Atlantic, explaining much of the coherent variations in the SLAC from the Gulf of Mexico to Southeast coast of USA. [Eleanor Frajka-Williams, United Kingdom (of Great Britain and Northern Ireland)]	this part has been removed
24383	4	25	42	25	47	The dominance of different drivers of local sea level at the western boundary of the Atlantic may depend on timescale. Little et al. 2017 JGR 10.1002/2017JC012713 showed that on short timescales (up to ~10 years) winds dominate local sea level variations but that on longer timescales 15+ years, the AMOC is a primary driver. This analysis was done in CESM-LE [Eleanor Frajka-Williams, United Kingdom (of Great Britain and Northern Ireland)]	this part has been removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
16347	4	25	43	25	43	You should use 'regional sea level' here, probably, as local sea level changes are covered in the following subsection. [Alexander Nauels, Germany]	this part has been removed
25745	4	25	48	25	48	atlantic to Atlantic [Government of India, India]	this part has been removed
25653	4	25	49	25	50	"In the Norwegian .... Contribute". The sentence is incomplete. [Government of India, India]	this part has been removed
6251	4	25	52	0		Change "sectiors" - is "sectors" or "sections" meant? [Nina Hunter, South Africa]	accepted and corrected
6267	4	26	5	0		Make "contribution" plural [Nina Hunter, South Africa]	accepted and corrected
6253	4	26	7	0		Change "has" to "have" [Nina Hunter, South Africa]	accepted and corrected
6255	4	26	8	0		Change "provides" to singular [Nina Hunter, South Africa]	rejected. The term "sum" is singular
19907	4	26	13	26	14	So the black line comes from the model or the tide gauge record? edit: I found the answer, it's from the tide gauge. But it's written in the caption of Figure 4.4. I think the author should clarify it in the text as well. [APECS Group Review, Germany]	It i swritten in the text on the next sentence
6257	4	26	14	0		Suggest replacing hyphens around "black lines" with brackets for consistency [Nina Hunter, South Africa]	accepted and corrected
25655	4	26	14	26	14	sea level -black lines- . Not understandable as to what it means [Government of India, India]	accepted and clarified now
6259	4	26	16	0		Suggest replacing hyphens around ""90% CL" with brackets for consistency [Nina Hunter, South Africa]	accepted and corrected
25657	4	26	16	26	16	90% -CL- not understandable [Government of India, India]	accepted and corrected
19909	4	26	19	26	20	Explain "correction of this bias". For instance, "correcting the bias in the Infrared sensors on the TRMM satellite". [APECS Group Review, Germany]	We now refer to Sections 4.2.2.3, 4.2.2.3.4 and 4.2.2.3.6 where this bias is explained
4729	4	26	24	0		Re India: it would be useful to include a gauge from India in Figure 4.4 [Debra Roberts and Durban Team, South Africa]	Places where tide gauges appear were chosen collectively with other chapter lead authors at an early stage of the writing. The objective was to cover different type of environment and to be to be consistent across the whole SROCC report. At this stage we can not add a new tide gauge station
6261	4	26	24	0		Replace semi-colon with a full stop [Nina Hunter, South Africa]	accepted and corrected
32327	4	26	24	26	24	It is not obvous how groundwater depletion is resposible for the low 20th century sea level rise (because of the associated decreas in geoid). This merits further explanation and references. [Donald Boesch, United States of America]	Partially accepted. We don't have enough space left in the chapter to enter detailed explanations here. We add a reference to help the reader further.
4021	4	26	24	26	25	Should be "the groundwater depletion is responsible for the low 20th century sea level rise" or "the low 20th century sea level rise is responsible for the groundwater depletion" [Lim Lee-Sim, Malaysia]	It is supposed to be "the groundwater depletion is responsible for the low 20th century sea level rise". We now refer the reader to Meyssignac et al. 2017c for more details
33457	4	26	24	26	25	This sentence seems to indicate that sea-level rise would be higher without groundwater depletion around India - true? [Government of United States of America, United States of America]	Yes that is true
25659	4	26	25	26	25	low 20th centuary, not understable [Government of India, India]	The reason for the low sea level rise around india generated bu groundwater depletion is explained within brackets. It is because of the decrease in local geoid following the removal of groundwater mass.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33459	4	26	27	26	36	In this section, is it worth noting how many fully coupled climate models can even begin to simulate SLR? Many of these models are "offline" and there isn't a feedback. [Government of United States of America, United States of America]	In this report we assess sea level projections rather than climate models. It is true that part of sea level projections are based on offline models and part of them are based on climate models. As a consequence, when we assess sea level projections we actually assess the whole suite of models that enable current sea level projections and not only climate models. We could explain this here indeed. But to do so we would need to explain how climate models and offline models are combined together. Unfortunately we don't have space left in this report to go in this level of details
6263	4	26	28	0		Remove "a" [Nina Hunter, South Africa]	accepted and corrected
23197	4	26	28	26	29	"This is a tangible progress since AR5'" : this is what we need to see more, and reflected in the ES/SPM (better confidence in tools) more explicitely. [Valerie Masson-Delmotte, France]	In the SPM we try now to reflect this tangible progress better
6265	4	26	29	0		Suggest replacing "on" with "regarding"; suggest replacing "like for" with "such as" [Nina Hunter, South Africa]	accepted and corrected
10327	4	26	29	26	36	"doubts remain on the ability of climate models to reproduce local variations" What is the implication of this to the projected SLR in isolated small islands? [Mahmood Riyaz, Maldives]	For the time being the reasons for the doubts are being investigating. We don't have any material available in the litterature yet to document what the consequence would be for small islands.
2501	4	26	31	0		The thermal expansion on the shelves is small. The coastal sea level rise is associated with offshore thermal expansion and mass contributions. It seems to me this text is based on a misunderstanding and is misleading. [John Church, Australia]	That is true this part can be confusing. The text is removed now
6269	4	26	36	0		Suggest remove "so far" [Nina Hunter, South Africa]	accepted and corrected
4727	4	27	0	0		Figure 4.4: the pale blue areas are too faint. Need to be darker. Also change the dashed dark blue line rather to a solid line of another colour - the interrupted dashes hide the trend. - line 6-7: is the variability in local sea level (black lines) due to internal climate variability or local weather like wind etc? [Debra Roberts and Durban Team, South Africa]	partially accepted and corrected. We can not change the dashed blue line because we want to keep consstent with figure 4.2 and we want to make clear that the dashed blue line is linked with the plain blue line. At interannual time scale the weather is smoothed out. What is left is the interannal variability
1499	4	27	0	27		larger fonts to be used to improve clarity [Chandani APPADOO, Mauritius]	rejected. We tried with a larger font and it resulted in an overloaded figure
590	4	27	1	27	9	A title for this figure would be nice, or at least a label other than units for the colorbar. [Jenna Pearson, United States of America]	accepted and corrected
10329	4	27	1	27	9	Very few tie gaiuge records from small islands uncertainity seems high for small islands. [Mahmood Riyaz, Maldives]	Places where tide gauges appear were chosen collectively with other chapter lead authors at an early stage of the writing. The objective was to cover different type of environment and to be to be consistent across the whole SROCC report. At this stage we can not add a new tide gauge station
6271	4	27	2	0		In the label it says that the figure is for the periods 1901-1920 and 1996-2015 but in the tables data is shown for all years. Please clarify. [Nina Hunter, South Africa]	We don't understand to which tables the reviewer is refering to.
25661	4	27	2	27	2	Caption says rate of change, but the units are "mm". [Government of India, India]	accepted and corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11449	4	27	2	27	3	the unit of colorbar isn't right if it's the rate of change in sea level -- it should have time unit. Also, shouldn't it be from climate model output instead of climate model input? [Anson Cheung, United States of America]	accepted and corrected
10501	4	27	2	27	9	The caption to Figure 4.2 is confusing. Is there one set of model results, in blue, plus observations in black? Or is there the "modelled" sea level, and the observations, and results from climate models, as suggested by the caption? [James Renwick, New Zealand]	accepted and clarified now
6273	4	27	8	0		Suggest replacing colon with comma [Nina Hunter, South Africa]	accepted and corrected
22513	4	27	14	27	27	Suggest this section also address differences between open coast settings and estuaries (for example, Hanslow et al., 2018 https://www.nature.com/articles/s41598-018-25410-y). [Government of Australia, Australia]	we added this reference
33461	4	27	15	27	18	Should a distinction between sea level change and extreme water level be made here? Wave run up is part of EWL, but not necessarily sea level change. Some clarity here would be helpful to distinguish terms to avoid confusion. Maybe change "sea level change" to "instantaneous water surface elevation change" for clarity. RSL and ESL distinctions in this paragraph could be clearer. [Government of United States of America, United States of America]	the difference between ESL and RSL is explained better in this section
3009	4	27	16	27	16	Do the authors want to mention runup (the altitude) or swash (the difference between mean water level and the maximum instantaneous water level)? I suppose this is swash and that the wave setup should be mentionned as well. (also applies line 29 and p29 l24) [Goneri Le Cozannet, France]	we sum them under wave effects to keep it simply for the reader
19911	4	27	18	27	18	A lot of factors affecting sea level change, but no reference for any of them? Please put at least one reference for every factor mentioned in the statement or put a link of the section where the references are given. [APECS Group Review, Germany]	it is just mentioned as an indication of the processes which play a role at local scales, it doesn't aim to be complete
33463	4	27	27	27	27	Add short reason "because ...". [Government of United States of America, United States of America]	we added in half a sentence the reason for this (limited studies, poor geographical coverage)

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21813	4	27	29	0		Global and regional analyses in recent publications focus on the wave setup component of waves that contribute to ESL as setup inside the surf zone is a more continuous expression of SL at the coast than intermittent wave runup (which is also highly sensitive locally to beach slope and the type of backshore profile e.g. dune vs seawall). Therefore text should be changed from wave runup to "wave setup". Refs on debate over use of wave setup vs also including wave runup for global and regional ESL studies e.g. Vousdoukas et al. 2018. Nature Communications, DOI: 10.1038/s41467-018-04692-w, Vitousek, S. et al., 2017 (already a Ref for Chapter 4) and recent paper by Melet etal. (2018) -(in Chapter 4 Refs), the critique by Aucan et al. (https://doi.org/10.1038/s41558-018-0377-5) and reply by Melet et al. (https://doi.org/10.1038/s41558-018-0378-4). [Robert Bell, New Zealand]	we added these references
6275	4	27	31	0		Place bracket before "Vousdoukas" and remove from before "2016" [Nina Hunter, South Africa]	changed accordingly
12695	4	27	33	27	33	It is 'GESLA' and not 'GELSA'. [Olusegun A. Dada, Nigeria]	changed accordingly
19913	4	27	34	27	34	High-frequency dataset advances…." how frequent? Please clarify it in the text in paranthesis. Is it hourly, daily, weekly, monthly dataset? [APECS Group Review, Germany]	added
6277	4	27	37	0		Suggest remove "have continued" as it seems unnecessary [Nina Hunter, South Africa]	rephrased
19915	4	28	6	28	6	Ending the paragraph with this statement evokes more questions than answers. What are the "various approaches" there? [APECS Group Review, Germany]	paragraph removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3011	4	28	8	28	32	This paragraph reports about recent studies adressing global to regional impacts of ESL. The coastal engineering community may say that the physical processes mentionned in this paragraph are quantified since a long time on an operational basis (see e.g. USACE coastal engineering manuals 2002, available https://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/u43544q/436F617374616C20456E67696E656572696E67204D616E75616C/ or technical reports (numerous examples, here one from our group: Garcin 2009 SIIRM Project “Risk Assessment” task: Mid project technical report & mission 2 report, see eg figs 21, 22, 23…). To resolve this issue, I suggest adding a sentence like: "Quantifying the various processes leading to extreme coastal water levels has long been adressed by the coastal engineering community". [Goneri Le Cozannet, France]	we don't disagree, but don't see where we should add this remark
6281	4	28	12	0		Suggest replacing "is" with "was" [Nina Hunter, South Africa]	agreed
3543	4	28	16	28	16	The reference to Melet et al 2016 is incorrect, since the paper listed does not discuss sealevel rise. A better reference (which should be changed in the reference list) is A. Melet, R. Almar, B. Meyssignac. « What dominates sea level at the coast: a case study for the Gulf of Guinea ». Ocean Dynamics, vol 66 (5), pp. 623-636, doi: 10.1007/s10236-016-0942-2 [Sonya Legg, United States of America]	corrected
9165	4	28	16	28	16	The Melet et al. 2016 reference cited in the text is missing in the list of references. A. Melet, R. Almar, B. Meyssignac, 2016. « What dominates sea level at the coast: a case study for the Gulf of Guinea ». Ocean Dynamics, vol 66 (5), pp. 623-636, doi: 10.1007/s10236-016-0942-2 [Angelique Melet, France]	see previous comment

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2437	4	28	16	28	18	Saying that "high water levels have doubled" can be severly misinterpreted, what happened is that high waters have increased twice as much as one would expect from long-term SLR alone, bacuse of additional changes in the seasonal cycle. This has been further discussed in Calafat et al., 2018, https://doi.org/10.1038/s41467-018-04898-y, with several important conclusions: 1. the changes detected since 1990 were part of a large decadal fluctuation in the amplitude of the seasonal sea level cycle, 2. it was not just confined to the Gulf of Mexico but extended into the Atlantic along the US east coast until Cape Hatteras, and 3. the changes were linked to Rossby wave propagation [Thomas Wahl, United States of America]	rephrased
6283	4	28	18	0		Suggest replacing "they" with "these authors" [Nina Hunter, South Africa]	changed accordingly
6285	4	28	23	0		Replace "was" with "were" as there are a number of authors [Nina Hunter, South Africa]	changed accordingly
11571	4	28	23	28	24	I did a similar research using DELFT3D-FLOW on the Hampton Roads area in Virginia, could it be included? Castrucci, L., & Tahvildari, N. (2018). Modeling the Impacts of Sea Level Rise on Storm Surge Inundation in Flood-Prone Urban Areas of Hampton Roads, Virginia. Marine Technology Society Journal, 52(2), 92-105. [Luca Castrucci, United States of America]	added
19917	4	28	24	28	24	Suggestion: change the sentence to "able to detect local inundation hazards". [APECS Group Review, Germany]	changed accordingly
25423	4	28	24	28	24	A WW3-modeling is already operationnal in France for storm-surge and waves forecast at the national-scale "Vigilance Vague-Submersion" see "Quevaullier, P. et al., Management of the effects of coastal storms, ISTE, 2017).https://books.google.fr/books?id=JzdZDgAAQBAJ&pg=PT100&lpg=PT100&dq=storm+surge+modeling+vigilance+vague+submersion&source=bl&ots=fkpl-38-k3&sig=5CLRJOEzYWaiSgy2GACzxWV0ne4&hl=fr&sa=X&ved=2ahUKEwjouOixzOXfAhXFDGMBHXHEC5QQ6AEwBnoECAEQAQ#v=onepage&q=storm%20surge%20modeling%20vigilance%20vague%20submersion&f=false. Results of the modeling are made avalaible on a real-time portal : https://data.shom.fr/ [Boris LECLERC, France]	paper cannot be found, link is incorrect
2439	4	28	27	28	28	The part about how RMSL affects ESL feels misplaced, it should occur later when future scenarios are discussed (and where reference is made to the Arns et al. (2017) paper, which basically shows the same). [Thomas Wahl, United States of America]	this has been removed in order to shorten the text

Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3013	4	28	27	28	28	I do not understand the sentence: "the scale is often smaller than those applied in climate models". I suggest to say that this topic (erosion and accretion) is adressed later in the report (e g section 4,3,2) [Goneri Le Cozannet, France]	the text has been rephrased to clarify
10331	4	28	28	28	28	What is high oceanic island? [Mahmood Riyaz, Maldives]	unclear where this refers to not page 28 line 28
19919	4	28	30	28	32	These two statements should be placed higher up. Otherwise, please change the sentence structure to fit them as the end of the paragraph. [APECS Group Review, Germany]	text has been removed
21815	4	28	32	0		In light of my previous comment - I support text that wave setup is essential to estimate flood risk [Robert Bell, New Zealand]	we agree
12007	4	28	38	0		See uncertainty analysis from Vousdoukas et al 2018 (Nature Communications): Present day ESL100 uncertainties are related to the predictive skill of the ocean models, as well as the fitting errors during the extreme value analysis of the ηCE time series. For future estimates, ηCE uncertainty is increased by the contribution of the inter-GCM variability with regards to the future climate prediction. Under RCP4.5 and during most of the century, climate extremes remain the main source of uncertainty (Fig. 5c, e), in agreement with previous findings2. By the year 2050, 28% of the uncertainty originates from climate extremes, with Antarctica, glaciers and dynamic sea-level change contributing with 15% each. By the end of the century Antarctica contributes 25% of the uncertainty, followed by glaciers and ηCE (14%). Higher projected SLR ranges under RCP8.5, come with higher uncertainty from the individual components, and dynamic sea-level change is the main source of uncertainty in the near future (Fig. 5d, f). Ice-loss from Antarctica becomes the main source of uncertainty after 2030, with a contribution reaching 50% by the end of the century. Most remaining components have similar contributions ranging from 6 to 10%. To summarize, the upper-tail projections of changes in ESL100 under a business as usual scenario are mainly driven by Antarctica ice loss (Fig. 7, Supplementary Fig. 12). Contributions are more balanced under a moderate-emission-mitigation-policy scenario with Antarctica surpassing steric effects only by the end of the century (Fig. 6). [Michail Vousdoukas, Italy]	we removed all information on projections here as this paragraph is on observations
6287	4	28	40	0		Suggest replacing "above processes" with "the processes outlined above" [Nina Hunter, South Africa]	changed accordingly
19921	4	28	40	28	43	These three statements should be supported by reference. [APECS Group Review, Germany]	reference is given at the end of the paragraph

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19923	4	28	47	28	48	This line should be placed in other section. why suddenly talk about the effect of climate? And it's only a one-liner with not much substantial elaboration. [APECS Group Review, Germany]	it is meant to illustrate that though RSL is mainly driven by subsidence one still needs to include the direct climate effect in order to make an adequate risk analyses, so the sentence is maintained
3633	4	28	53	28	53	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	adjusted accordingly
22873	4	28	57	29	4	How the extraction of groundwater, oil, and gas increase the rate of compaction? Broad conception and ambiguous information! [Government of Saudi Arabia, Saudi Arabia]	As explained in the sentence extraction from a deltaic sediment leads to compaction see paper by Higgins 2016
2387	4	29	0	117		sea level rise and subsidence: i have a general problem with values odf subsidence rate given through this chapter. They are basically same order of magnitude as sea level rise, i.e few mm/year. In fact all recent findings give subsidence rates ten tiimes higher: few cm/year. A clear statement, with values, is given in the report "SINKING CITIES, An integrated approch towards solutions", published by Deltares-Task Force subsidence, Jan2015, www.deltares.nl , quoting: "In many coastal and delta cities land subsidence exceeds absolute sea level rise up to a factor of ten " This result is totally ignored within this chapter, and several valus givan in the text are erroneous.THIS DISCREPANCY COULD HAVE A HIGH IMPACT IN TERM OF ESTIMATION OF RISK OF SALINIZATION AND SUBMERSION OF LOW ELEVATION COASTAL ZONES AND CITIES [georges VACHAUD, France]	On page 28 and page 29 we explain that subsidence rates may even go up to 100 mm yr-1. So we fully agree with the reviewer that subsidence is important
32329	4	29	1	29	1	Oil and gas are not extracted from deltaic sediment, but rather deeper consolidated strata not necessarily formed from deltaic deposits. [Donald Boesch, United States of America]	framed it more generally as fluids
2389	4	29	6	29	9	subsidence rates of 6-9 mm/yr given for the urban center of Kolkata and Dhaka seem underestimated .For similar situation, in Bangkok the rate was reaching 120mm/y (Phien-wej N. et al, Engineering Geology, 2005) [georges VACHAUD, France]	we report average rates as in the paper by Brown we agree that in the past higher rates where measured in Bangkok
4237	4	29	6	29	20	Esteban et al. (2018) indicated subsidence ratios in Yakarta (along the coast) from 95 to 215 mm/year. [Josep Ramon MEDINA, Spain]	we could not find this reference
4239	4	29	6	29	20	Esteban et al. (2018): Adaptation to sea level rise in cities: Lessons from present examples of land subsidence. Proc. Coasts, Marine Structures and Breakwaters 2017, ICE Publishing, Vol. 1, 29-39. [Josep Ramon MEDINA, Spain]	we could not find this reference

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2391	4	29	13	29	28	In reference to my paper related to Ho ChiMingh cities, reported values of subsidence obtained by satellite imagery and radar interferometry are quite higeher than those reported for the Gange Delta: subsidence rate reaches 40 mm/yr in the dowtown area of HCMC (values given in my paper and extracted from Koudogbo F.N. et al, EO information Services in support of Multi Hazard Vulnerabiility assesment in HoChiMinh City, EOWORLD, European Space Agency, Feb 2012 and DINH H.T.N et al., Mapping ground subsidence phenomena in HCMC though the radar interferometry technique.., Remote Sensing, 2015). Similarly huge difference with the Gange delta were obtained for Djakarta, for the period 1982-2010 they are in the range 100-150mm/yr , with in few locations 200-280mm/yr (Hanasnuddin Z.A et al, Land subsidence in Djakarta and its relation with urban development, Natural Hazards, June 2011) [georges VACHAUD, France]	we are willing to report higher values but we cannot find the paper by Hanasnuddin nevertheless we make the point that subsidence is sometimes larger than RSL. The Importance of subsidence is stressed comes in the executive summary and even in the SPM
4731	4	29	15	0		These are important policy relevant findings (subsidence), rate of subsistence needs to appear in SPM. [Debra Roberts and Durban Team, South Africa]	yes we agree there is an ES statement which carries over to the SPM
6289	4	29	22	0		Sentence does not make sense. Suggest removing "change"? [Nina Hunter, South Africa]	sentence has been rephrased
19933	4	29	22	29	28	If it is known that local processes can impact large-scale sea level rise patterns and they are not accounted for in the projections in this chapter, how valid are these projections then? [APECS Group Review, Germany]	this section is about subsidence and local scale processes. Large scale projections can not address that nevertheless we do our best to combine climate course scale projections with tide gauge records later in the chapter to make projections for ESL. This is an important step
6291	4	29	23	0		Suggest removing "the" before "local" [Nina Hunter, South Africa]	changed accordingly
19927	4	29	23	29	24	Remove "wave run up, storm.....and compaction". [APECS Group Review, Germany]	not clear why the reviewers want this
19929	4	29	25	29	25	Suggestion: change the sentence to "Although the effect of erosion,". [APECS Group Review, Germany]	changed accordingly

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11099	4	29	30	0		The whole section 4.2.2.6 is devoted to discuss the reliability of the assessment of the anthropogenic contribution to the different components of Sea Level Rise (global, regional, local), and extreme events. It could be biased by the choice of the referenced literature, but it looks reasonable and grounded. I would suggest that all the reference to the distinction between natural and anthropogenic contribution to the phenomenon behind the Sea Level Changes discussed in the previous section are moved here, not mixed in the section where the data and the phenomena themselves are described. This is because the methodology to discriminate and estimate the reliability of the process of discrimination between natural and human-related forcings is only described in this sections, and therefore the previous claims are just reference to sparse literature without a proper overview of the process. [Valentina R. Barletta, Denmark]	rejected: the previous section(s) do not address the impact of different forcings on sea-level change, this is the first section that addresses this issue. We are not clear what material in the previous section the reviewer refers to that addresses this.
15607	4	29	30	0		The whole section 4.2.2.6 is devoted to discuss the reliability of the assessment of the anthropogenic contribution to the different components of Sea Level Rise (global, regional, local), and extreme events. It would be beneficial that all the references to the distinction between natural and anthropogenic contribution to the phenomenon behind the Sea Level Changes discussed in the previous section are moved here. At present the references are mixed in the section where the data and the phenomena themselves are described. This is because the methodology to discriminate and estimate the reliability of the process of discrimination between natural and human-related forcings is only described in this sections, and therefore the previous claims are just reference to sparse literature without a proper overview of the process. [EUCE, Belgium]	taken into account - combined with comment 11099

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19925	4	29	30	31	43	This is a general comment for section 4.2.2.6: I suggest to organize the subsections and their content in a different way. I believe it is more intuitive to a reader if it is first shown that the change in the sea-level is detected (for different scales) and then to speak about attributions or the reason for the change. Right now the first subsection (4.2.2.6.1) speaks about attribution of sea-level change to anthropogenic forcing before it is shown the sea-level is changing (detection). Then section (4.2.2.6.2) speaks about detection of sea-level change but it is mixed with attribution to anthropogenic forcing. Section (4.2.2.6.3) is again detection but regional and section (4.2.2.6.4) is attribution but for sea-level extremes. I find this really confusing. [APECS Group Review, Germany]	taken into account - the section was considerably shortened, and now only focusses on attribution.
4733	4	29	33	0		Suggest putting the word 'detected' in quotes, to show that this sentence is a definition. Or even start the sentence with 'Detection', in the way the next sentence starts with 'Attribution'. [Debra Roberts and Durban Team, South Africa]	taken into account - this definition was deleted, as it is part of the glossary
19931	4	29	37	29	40	Maybe write the three ifs in a list form: (a) if there is understand..... climate system; (b) if an adequate.....numerical models; (c) if..... [APECS Group Review, Germany]	taken into account - this sentence was deleted
6293	4	29	38	0		Insert space between "external" and "forcing"? [Nina Hunter, South Africa]	taken into account - this sentence was deleted
31363	4	29	45	0	47	This writing should be revised to make clear that both process understanding and attribution studies need to come together for a comprehensive picture. [Hans-Otto Poertner and WGII TSU, Germany]	taken into account - quantitative process understanding is a prerequisite for attribution studies (not for detection studies); text was revised to better reflect this.
11451	4	29	51	30	32	Section 4.2.2.6.1 seems to cover similar contents as sections 4.2.2.6.2. and 4.2.2.6.3. So I think discussion in 4.2.2.6.1 can be incorporated into the latter sections instead of making it as an independent section. [Anson Cheung, United States of America]	taken into account - only two subsections remain under 4.2.2.6: one on the individual components of GMSLR, and one on the total of GMSLR. In the revised version, this distinction is hopefully clear.
6295	4	29	56	0		Replace "is" with "was"? [Nina Hunter, South Africa]	accepted - text changed accordingly
6297	4	30	9	0		Insert single quotation mark before "anthropogenic-only" [Nina Hunter, South Africa]	accepted - text changed accordingly
19935	4	30	20	30	20	"throughout the considered period, overall 69 +- 24% of the mass loss can be attributed to..." [APECS Group Review, Germany]	taken into account - text changed to: throughout the considered period, 69 ± 24% of the mass loss can be attributed to anthropogenic forcing
30041	4	30	25	30	29	A more detailed analysis of issues related to attribution for GIS and AIS is given in section 3.3.1.7. [Ronja Reese, Germany]	taken into account - this paragraph was deleted and a reference to 3.3.1.7 is given instead
10333	4	30	31	30	32	The effects of groundwater depletion and reservoir impoundment on sea level change are anthropogenic by definition (e.g., Wada et al., 2012). How ? What about ground water depletion by invading sea SLR?? Need to explain this bit more [Mahmood Riyaz, Maldives]	rejected - this is not about groundwater loss by salt intrusion, but by mass extraction, which only happens through anthropogenic interference

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19937	4	30	35	31	4	These paragraphs can be included in the first paragraph of 4.2.2.6.1. [APECS Group Review, Germany]	taken into account - only two subsections remain under 4.2.2.6: one on the individual components of GMSLR, and one on the total of GMSLR. In the revised version, this distinction is hopefully clear.
6299	4	30	45	0		Does the second "extremely likely" also need to be italicized? [Nina Hunter, South Africa]	taken into account - the corresponding paragraph was deleted
9167	4	30	54	31	1	It might be noted that accounting for the recent reconstruction by Dangendorf et al. 2017, discussed earlier in the chapter, in addition to the 4 cited reconstructions could also improve the closure of the budget. [Angelique Melet, France]	rejected - the reviewer is correct, but the reconstruction by Dangendorf et al (2017) was not considered in Slangen et al (2016). Since we do not discuss the agreement with the individual reconstructions that were considered, but just the agreement with their mean, adding the discussion of a newer, individual reconstruction would be too detailed.
6301	4	30	56	30	58	Sentence meaning not clear. Please make clear. [Nina Hunter, South Africa]	taken into account - this refers to a part of the budget that was not considered in Slangen et al. (2016); text rephrased to clarify.
21553	4	31	1	59	1	It would be useful to have more granular projections of SLR at the regional-level for countries that do not have national projections of SLR, and assessment of how global SLR would affect different regions differently. [Government of Singapore, Singapore]	taken into account - this is covered in the appendix
19947	4	31	16	31	16	Remove "In a related approach". [APECS Group Review, Germany]	taken into account - this sentence was deleted
22007	4	31	16	31	26	Here and elsewhere, why not refer to "time of emergence" as other Chapters have done? This seems to be what the Authors are going for here? [David Schoeman, Australia]	taken into account - this subsection was deleted
6303	4	31	21	0		Suggest removing "also" [Nina Hunter, South Africa]	taken into account - this sentence was deleted
19949	4	31	21	31	22	"Bilbao et al(2015) predict the earliest……" which is when? Please give more information. This sentence is rather vague and gives very little information to the readers. [APECS Group Review, Germany]	taken into account - this subsection was deleted
2503	4	31	28	0	29	I think this is an overly negative statement. The Detection work of Lyu et al and Richter et al are both relative to a recent reference period. Yet there is conclusive evidence of the dominance of anthropogenic activitiesto GMSL since 1970. And se level has been rising at almost all locations. True, there is significant natural variability and adequatly separating the natural variablity has not been completely done, but stating that it cannot be done seems incorrect. [John Church, Australia]	taken into account - this subsection was deleted
19951	4	31	28	31	29	From the explanation given above, I would suggest LOW confidence, as the author have already mentioned, regional and local mean sea level change are more difficult to attribute compared to global MSL change, due to their their size. [APECS Group Review, Germany]	taken into account - this subsection was deleted

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3015	4	31	31	31	43	This section discusses progresses made in the area of attribution of ESL since AR5. The section 4,2,2,6,2 is, however, about attribution and detection. In the area of detection of drivers of ESL changes, there has been important progresses since AR5, especially (but not only) in understanding the respective roles of mean sea level rise and modes of climate variability. There might be a paragraph to report these new results in section 4,2,2,6,2. Examples of papers (not exhaustive): Talke et al (2014); Marcos et al (2015); Wahl and Chambers (2015; 2016), Mawdsley and Haigh (2016), Marcos and Woodworth (2017), Rohmer and Le Cozannet (2018); Talke S A, Orton P, and Jay D A 2014 Increasing storm tides in New York Harbor, 1844–2013 Geophys Res Lett 41 3149–3155; Wahl T, and Chambers D P 2015 Evidence for multidecadal variability in US extreme sea level records J. Geophys Res Oceans 120 1527–1544; Mawdsley R J, and Haigh I D 2016 Spatial and temporal variability and long-termtrends in skew surges globally Frontiers in Marine Science 3 29; Wahl T, and Chambers D P (2016). Climate controls multidecadal variability in US extreme sea level records J. Geophys Res Oceans 121(2) 1274-1290; Marcos, M., Calafat, F. M., Berihuete, Á., & Dangendorf, S. (2015). Long-term variations in global sea level extremes. Journal of Geophysical Research: Oceans, 120(12), 8115-8134. Marcos, M., & Woodworth, P. L. (2017). Spatiotemporal changes in extreme sea levels along the coasts of the North Atlantic and the Gulf of Mexico. Journal of Geophysical Research: Oceans, 122(9), 7031-7048. Rohmer, J., & Le Cozannet, G. (2018). Dominance of the mean sea level in the high-percentile sea levels time evolution with respect to large-scale climate variability: a Bayesian statistical approach. Environmental Research Letters. [Goneri Le Cozannet, France]	taken into account - this subsection was deleted since Sect 6.3.2 covers attribution of ESL events
19953	4	31	32	31	32	"while there is a strong relationship….". [APECS Group Review, Germany]	taken into account - this subsection was deleted since Sect 6.3.2 covers attribution of ESL events
19955	4	31	38	31	39	"was intensified by the clout of anthropogenic activities." [APECS Group Review, Germany]	taken into account - this subsection was deleted since Sect 6.3.2 covers attribution of ESL events
19957	4	31	42	31	42	"…of the storm surge height by around 20%." [APECS Group Review, Germany]	taken into account - this subsection was deleted since Sect 6.3.2 covers attribution of ESL events
19939	4	31	42	31	43	There is a lack of uncertainty language in the sentence: “Removing the anthropogenic signal further leads to a mean decrease of the storm surge height of around 20%.” (medium confidence?). [APECS Group Review, Germany]	taken into account - this subsection was deleted since Sect 6.3.2 covers attribution of ESL events

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13945	4	31	45	31	45	Here and throughout the report the use of the term "AOGCM" is potentially confusing. Many (all?) climate models also have some represention of the cryosphere and land surface. Many also include Earth system components. I suggest using the term "coupled climate models" or similar - i.e. something that is more inclusive and does not appear to exclude the aforementioned model components. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly
26143	4	31	45	31	45	Inconsistent structure: There is subsections on ice sheets followed by 4.2.3.2 Global projections. I would have expected that projections for all other components are now given in individual subsections. Why are glacier projections not described ? Or other components (thermal expansion etc)? [Regine Hock, United States of America]	most of the development is on the changes in the Antarctic component. As there are no new CMIP simulations available there is not an improved insight in the steric component. For Greenland and glaciers there is also little progress which leads to nearly no differences in the estimated values for those components
17245	4	31	47	31	47	Define AOGCM at first use [Andra Garner, United States of America]	we abanonded that term
19941	4	31	47	31	47	AOGCM acronym is not explicitely written. [APECS Group Review, Germany]	we abanonded that term
26123	4	31	47	31	48	unless they are full coupled with ice sheet models (not the case in most cases) they can't (ice sheet/glacier component missing). This is acknowledged later but should be correctly formulated here too. [Regine Hock, United States of America]	that is explained in the next sentence
19943	4	31	47	31	56	change "AOGCMs" to GCMs (global climate models). Many coupled climate models in CMIP5 are earth system models rather than AOGCMs. [APECS Group Review, Germany]	we abanonded that term
4023	4	31	47	31	57	What does "AOGCM" stand for in full [Lim Lee-Sim, Malaysia]	we abanonded that term
11455	4	31	47	32	16	This paragraph revolves around two ideas -- the use of AOGCMs to project sea level, glacier and ice sheet component are calculated offline and can be a problem for future projections. Both ideas are repeated within the same paragraph, which makes the paragraph unnecessarily long. [Anson Cheung, United States of America]	the section in addition includes a short introduction on how RSL and ESL are calculated. We shortened it by removing 4 sentences
19945	4	31	47	45	12	Throughput the section the term AOGCM is used. Based on AR5, CMIP5 models are earth system models: “Climate models that include the carbon cycle (Earth System Models) …” (SPM D). Moreover, AOGCM is used only in this specific section and the full meaning of the abbreviation is not shown anywhere in the chapter. I suggest to use the term - Earth System Models (ESM) instead AOGCM, at list when refereing to the CMIP5 ensemble. [APECS Group Review, Germany]	we abanonded that term
13947	4	31	51	31	51	What does "AOGCM climatologies" refer to? In AR5, the projections for glaciers and ice sheet surface mass balance terms were based on relationships to global mean surface temperature. Please clarify this point in the text. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	adjusted to based on temperature and precipitation

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27011	4	31	51	31	51	"Climatologies" is jargon and not really accurate, because it usually means time-independent data. It would be more informative to say "temperature and precipitation changes simulated by AOGCMs". [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly
11453	4	31	54	31	56	Needs citation. [Anson Cheung, United States of America]	added
19959	4	32	1	32	2	Consider deleting "New estimates from CMIP6 are not yet availiable and will be discussed in AR6". [APECS Group Review, Germany]	no we prefer to maintain that as it is a justification for the fact that there are no updates on the thermal expansion component
13949	4	32	4	32	5	The projections of ice sheet changes in AR5 did not make any use of precipitation from CMIP5 model simulations. Please cite the relevant papers that have used this information and/or modify the text here accordingly. I think the issue here may be to discuss both the simple approach taken in AR5 and some of the regional modelling efforts that have included these forcings? It may be helpful to briefly review what was done in AR5 and what is new for SROCC in this regard? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	we added a sentence explaining the procedure in AR5
27013	4	32	5	32	5	See comment on page 31 line 51. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	rephrased
28609	4	32	7	32	8	Feedbacks between ice sheet dynamics and solid Earth deformation (a component of GIA) have also been shown to be important in controlling ice sheet evolution, so mention of the solid Earth should be included in this list of desirable components to be included in future coupled modelling efforts. Such feedbacks are discussed in the first paragraph of page 56 of this chapter and there is also a review article on this subject in press with Nature Communications (Whitehouse, P.L., Gomez, N., King, M.A., Wiens, D.A., in press. Solid Earth change and the evolution of the Antarctic Ice Sheet, doi:10.1038/s41467-018-08068-y). [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	added
6305	4	32	12	0		Change "remains" to singular; insert full stop at end of sentence [Nina Hunter, South Africa]	changed accordingly
2169	4	32	16	32	16	Horton et al 2018 has been published (doi:10.1146/annurev-environ-102017-025826) [Robert Kopp, United States of America]	changed accordingly
3635	4	32	18	32	19	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	changed accordingly
27015	4	32	20	32	20	Solid Earth deformation is also included i.e. GRD effects in the terminology of Gregory et al. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	rephrased
28611	4	32	22	32	22	In relation to the mention of forcing by off-line ice models: coupled models that consider feedbacks between ice dynamics, Earth deformation and spatially-variable sea-level change are also beginning to be used to predict spatially-variable RSL change due to GIA. See de Boer et al. (2017, Quaternary Science Reviews, 169, 13-28) for a review of this subject. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	added

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10335	4	32	34	32	40	How these models and projections are applicable for lo lying small islands given the scale is too large? [Mahmood Riyaz, Maldives]	this is problematic beyond the scale of climate models and addressed in the ESL section later on
6307	4	32	35	0		Insert space in "togetherwith" [Nina Hunter, South Africa]	changed accordingly
31365	4	32	42	0		It would be very helpful for a comprehensive understanding, and in light of what was done in AR5 SYR and the SR1.5 if statements on events by 2100 would always be complemented by perspectives for the time beyond, certainly at much lower levels of confidence. [Hans-Otto Poertner and WGII TSU, Germany]	This is handled in the section on "projections".
26125	4	32	42	32	42	Delete 'Dynamic'. What follows seems to be all components, i.e. all mass change [Regine Hock, United States of America]	Agreed. Deleted.
17137	4	32	42	40	49	Authors have done a good job on this section bringing together many divergent lines of evidence. It comes across as well-balanced and states areas of uncertainty explicitly. [Nick Golledge, New Zealand]	Appreciated.
9607	4	32	44	32	44	This section does not discuss surface albedo changes and their potential impacts on the Greenland melting rates. Several publications discuss the issue of darkening because or black carbon, algae or snow and ice changes (e.g. Keegan et al. (2014), Tedesco et al. (2016), Stibal et al. (2017), Tedstone et al. (2017)). Current ice-sheet models are run off-line, with a fixed geometry, and therefore neglect feedbacks between surface elevation and SMB, as well as between surface albedo and ice margin retreat. These assumptions could no longer holds under strong warming, as mentioned in Fürst et al. (2015) but not discussed in the report. If the landward retreat of outlet glaciers away from the coast suggests that Greenland's potential for a dynamic contribution to sea level may be limited, the uncertainties mentioned above should be discussed. [Government of France, France]	Good suggestion. Also Ryan et al., 2019.
33465	4	32	44	34	15	Consider adding something to this section (or maybe as an intro paragraph to 4.2.3.1) about the overall improvement in the "skill" of the current generation of ice sheet models (relative to AR4 and AR5) with regard to their ability to mimic and/or reproduce observed ice-dynamical behaviors (e.g., as argued in Price et al. (2017, Geosci. Model Dev., 10, 255--270, 2017, doi:10.5194/gmd-10-255-2017)). [Government of United States of America, United States of America]	This is intended to be covered in a cross chapter box in Chapter 3.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10215	4	32	45	33	3	Suggest including the finding of the following study on Greenland Ice Sheet: Luke D. Trusel, Sarah B. Das, Matthew B. Osman, Matthew J. Evans, Ben E. Smith, Xavier Fettweis, Joseph R. McConnell, Brice P. Y. Noël & Michiel R. van den Broeke, 2018: Nonlinear rise in Greenland runoff in response to post-industrial Arctic warming [SAI MING LEE, China]	Agreed. Trusel 2019 is now cited.
30021	4	32	45	34	15	Please consider also Calov et al. (The Cryosphere, 2018). [Ronja Reese, Germany]	Good suggestion. Calov et al. (2018), and Aschwanden et al. (in review), are now added.
26127	4	32	45	35	46	These pages are extremely well written and a pleasure to read but there is quite some textbook typ background information and in particular a lot of repetition in particular with chapter 3. [Regine Hock, United States of America]	The chapter team agrees. This section has been shortened.
2541	4	32	49	32	51	The decrease in refreezing capacity is valid for the detached ice caps in Greenland, not the main ice sheet [Michiel Van den Broeke, Netherlands]	This should be clear to the reader given the current description and addition of Noel et al., 2017
24475	4	32	49	32	51	" The ability of firn on Greenland to retain meltwater until it refreezes has diminished markedly since the late 1990s. These changes in firn have increased rates of runoff more than rates of meltwater production, especially in lower elevations (Noël et al., 2015)." overlaps with information in chapter 3, but there more (up to date) references in chapter 3: p3-51 l 29-31" Across the Arctic, increased surface melt also reduces the ability of snow and firn to store meltwater, increasing runoff (Zdanowicz et al., 2012; Gascon et al., 2013a; Gascon et al., 2013b; Noël et al., 2017)." [Eef van Dongen, Switzerland]	See above.
9967	4	32	53	32	54	"relationship between meltwater and ice dynamics seems not important" - seems an overly sweeping and certain statement based on too few references and not considering the role of water in marine-terminating outlets (connection between subglacial drainage, fjord circulation, terminus behavior). [Gwenn Flowers, Canada]	This statement is moderated by the term "may be limited" and later in the text with the discussion on subglacial and marginal bathymetry.
6309	4	32	54	0		Suggest replace "seems not" with "does not seem"; suggest replace "which" with "and" [Nina Hunter, South Africa]	This wording has been changed.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33467	4	32	57	32	57	Additional citations here could include: Hoffman, M. J., L. C. Andrews, S. A. Price, G. A. Catania, T. A. Neumann, M. P. Luethi, J. Gulley, C. Ryser, R. L. Hawley, and B. F. Morriss (2016), Greenland subglacial drainage evolution regulated by weakly-connected regions of the bed, Nat. Commun., 7, 13903, doi:10.1038/ncomms13903 and Hoffman, M. J., M. Perego, L. C. Andrews, S. F. Price, T. A. Neumann, J. V Johnson, G. Catania, and M. P. Lothi (2018), Widespread moulin formation during supraglacial lake drainages in Greenland, Geophys. Res. Lett., 45, doi:10.1002/2017GL075659. [Government of United States of America, United States of America]	Agreed, although additional discussion is not critical, given our space constraints.
4737	4	33	0	0		Figure 4.5: are the black outlines of the continental shelf, especially on the east facing edges in the Greenland panel, 'shadows' or are there a deep ocean trenches? [Debra Roberts and Durban Team, South Africa]	They are 'shadows' caused by steep relief.
19961	4	33	5	33	5	"CMIP5 AOGCMs" should be "CMIP5 GCMs". [APECS Group Review, Germany]	Agreed.
15139	4	33	12	33	12	The range 7cm-21cm is not for 2100 but for 2081-2100, in AR5. Range for 2100 is 9-28cm. [Dewi Le Bars, Netherlands]	Agreed.

Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
25245	4	33	14	34	15	The literature published since AR5 has, undoubtedly, made very good progress in quantifying the spread in sea-level rise projections from Greenland. However, all of the cited studies have deficiencies that call into question the assertion that Greenland's "dynamic contrbution to sea level may be limited" (page 33, line 21) and that "future Greenland ice loss will be dominated by surface processes" (page 34, line 6). In particular, Fürst et al. (2015) and Goelzer et al. (2013) use bed topography from Bamber et al. (2013), which is known to not preserve the depth nor structure of the subglacial troughs for Greenland's marine-terminating glaciers (Morlighem et al., 2014). Both of these studies use models with a horizontal resolution of 5 km, which also may not be sufficient to reproduce outlet glacier dynamics. Furthermore, Vizcaino et al. (2015) use a 10 km horizontal resolution and shallow ice physics, which are not appropriate for modeling the dynamics of Greenland's fast-flowing outlet glaciers. I would argue that the results of Vizcaino et al. (2015) study should not be used to deduce the relative contributions of surface processes and ice dynamics on future sea-level rise projections. Again, this comment is not meant to downgrade the importance of the cited studies. But these model deficiencies should be clearly but concisely explained in these two paragraphs as caveats. The assertion that Greenland's "dynamic contrbution to sea level may be limited" (page 33, line 21) should be reworded to be more specific, such as, "Greenland's dynamic contribution to sea level may decrease in the future, depending on Representative Concentration Pathway." And the assertion that "mass loss may be dominated by surface processes in the future" should come with the caveats that I discuss above. [Denis Felikson, United States of America]	These are valid points. The Vizcaino reference has been removed here. The uncertainty is emphasized later in the text.
15067	4	33	29	33	33	Please add markers for the deep subglacial basins on Fig. 4.5 (right) to help identification [Government of Germany, Germany]	This should be clear given the color scheme. Labels have been added.
10337	4	33	31	33	33	Could have shonw the changes in the ice sheats ib both greenland and Antartica [Mahmood Riyaz, Maldives]	The Chapter Team agrees in principle, but we are limited by space constraints.
10853	4	33	31	33	33	Reference Morlighem should be placed in connection with Greenland (left) and not together with Antarctica [Ola Kalén, Sweden]	Agreed. Fixed.
23735	4	33	31	33	33	Reference Morlighem should be placed in connection with Greenland (left) and not together with Antarctica. [Government of Sweden, Sweden]	See above.
6311	4	33	33	0		Check spelling of "floatation" - should it not be "flotation"? [Nina Hunter, South Africa]	Agreed. Typo fixed.
10829	4	34	3	34	3	I found the view put forth in this paragraph to contrast a bit too much much with that in the paragraph before. I think these paragraphs could be merged better. [Magnus Hieronymus, Sweden]	This section has been shortened.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
23719	4	34	3	34	3	The view put forth in this paragraph contrasts a bit too much much with that in the paragraphs before. Please amend for consistency, as appropriate. [Government of Sweden, Sweden]	Improved and shortened. see above.
2585	4	34	4	34	4	Might also note that ice-cliff failure is observed in ALL marine-ending ice in warm climates. There are noglacier-fed marine ice shelves in sufficiently warm environments, instead leaving cliffs that calve directly into the ocean. The Laurentide and Fennoscandian Ice Sheets (including the Heinrich Events; see, e.g., Alley et al., 2015, Annual Reviews of Earth and Planetary Sciences 43, 207-231) retreated in part through generation and enlargement of calving bays, and tidewater-glacier retreat by cliff calving is well-known (e.g., Glacier Bay or Columbia Glacier, Alaska, and many others). The temperature threshold for onset of such behavior remains notably uncertain, but the existence of such behavior under sufficient warming is almost certain. [Richard Alley, United States of America]	Agreed, however supporting literature remains thin.The geological perspective is now better emphasized elsewhere in the text.
23199	4	34	5	34	15	To be conveyed in ES and SPM [Valerie Masson-Delmotte, France]	Agreed.
5393	4	34	9	34	9	I suggest to add this: similar to the upper end of the likely range reported by AR5 (Church et al., 2013), "by assuming nevertheless that no general circulation change will occur in summer (Delhasse et al., 2018; Hanna et al., 2018)." [Xavier Fettweis, Belgium]	This reference has been added.
33469	4	34	16	34	16	"reanalyese products" should probably be "reanalysis products" [Government of United States of America, United States of America]	Typo not foumd.
4741	4	34	17	0		Authors need to be sensitive to the over use of acronyms. It makes reading for the policy maker just so much more difficult. Readers can't go back to find the definition each time an acronym is used. WAIS - MISI - GCM - CDW - AIS - SMB - etc. Just in one section. Impossible for the reader to remember em all. Spelling them out would help the reader understand. [Debra Roberts and Durban Team, South Africa]	An attempt has been made to improve this.
27451	4	34	17	0		This is an extremely long discussion on the Antarctic ice sheet contribution, which would rather fit into a chapter on ice sheet processes than on sea level. I feel it is not balanced, strongly promoting the results from a small group of authors. The paragraphs starting on p38 L6, p38 L26, P38 L45, p39 L4, p39 L19 all largely discuss the results of this specific author group. It is a very specific for non-ice sheet modellers. [Matthias Mengel, Germany]	The author team appreciates this comment, but the greatest changes since AR5 have been on the Antarctic contribution. This section is now shorter, but still emphasized because of the deep uncertainty represented the Antarctic component.
31189	4	34	17	0		This section is too extensive and needs clearer synthesis including confidence statements. [Hans-Otto Poertner and WGII TSU, Germany]	This section has been substantially shortened.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11111	4	34	17	40	38	In general, the whole section "4.2.3.1.2 Antarctica" is excessively detailed. The message is that the complexity of the coupling of atmosphere/ocean and ice dynamics, all tightly coupled in Antarctica, is still challenging, and despite some progress in the modeling since AR5. The uncertainties are still far too large, especially for strong climate forcing scenarios, and for the long term predictions (beyond 2100 for sure). However, an exaggerate part of the discussion is focused on the MICI (Marine Ice Cliff Instability), that is a new phenomenon includes in one of the recent models Pollard and DeConto (2016) and DeConto et al (under review). And given that admittedly is not the only phenomenon that allows to remove the uncertainties, I do not see the point of focusing so much of the discussion on this specific phenomenon alone. This also considering that the second and most recent paper (DeConto et al. in review), is not published yet and therefore is not available to anyone of us at the moment of this review. [Valentina R. Barletta, Denmark]	see above.
15609	4	34	17	40	38	In general, the whole section "4.2.3.1.2 Antarctica" is excessively detailed. The message is that the complexity of the coupling of atmosphere/ocean and ice dynamics, all tightly coupled in Antarctica, is still challenging, and despite some progress in the modeling since AR5. The uncertainties are still far too large, especially for strong climate forcing scenarios, and for the long term predictions (beyond 2100 for sure). However, an exaggerated part of the discussion is focused on the MICI (Marine Ice Cliff Instability), that is a new phenomenon included in one of the recent models Pollard and DeConto (2016) and DeConto et al (under review). And given that it is not the only phenomenon that allows to remove the uncertainties, I do not see the point of focusing so much of the discussion on this specific phenomenon alone. This is difficult for a reviewer to judge given that DeConto et al is not yet published at the time of this chapter review. [EUCE, Belgium]	see above.
16349	4	34	17	40	38	While this extensive assessment of post-AR5 research on future Antarctic SLR contributions is much appreciated, the balance of cited research should be improved! [Alexander Nauels, Germany]	Agreed, but there is limited new literature on the Antarctic component, despite its potential importance.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33471	4	34	17	40	38	This entire section requires a bit more care in how the results of the whole-Antarctic ice sheet modeling results are discussed. First, all of the models discussed in detail in this section use far too coarse resolution to accurately capture MISI dynamics. This is well known and understood at this point, and that fact warrants further discussion in this section (e.g., as discussed and shown in detail for whole-Antarctic simulations in Cornford et al., Ann. Glac. 57(73) 2016 doi: 10.1017/aog.2016.13). Second, and similarly, the level of uncertainty attached to simulations that employ the marine ice cliff instability does not accurately reflect the consensus of the community at this time. The amount of space devoted to this topic suggests a level of importance and consensus that does not exist within the broader community. Furthermore, recent results (e.g., presented by Dan Martin and others at the 2018 AGU meeting) using very high-resolution modeling that employs an ice cliff instability mechanism suggest that a large degree of the sensitivity exhibited by the Pollard and DeConto models may be a direct function of their model's coarse grid resolution (i.e., large cliffs are not maintained when adequate spatial resolution is employed, and those large cliffs are necessary to achieve the rapid rates of retreat and collapse exhibited by the Pollar and DeConto simulations). In short, the uncertatainties in the modeling results discussed in this section appear vastly understated based on what is known about coarse resolution model results bias. [Government of United States of America, United States of America]	The Chapter Team appreciates these comments. The uncertainy is now more strongly emphasized- but continental scale results are needed for sea level projections. We do note that no ice-sheet scale model, regardless of its grid scheme, resolution, or numerics, fully captures all the relevant processes. The lack of concensus on MICI is the very reason for the extensive discussion. Dan Martin's results are unpublished, and they themselves could very well be a model-dependent artificact, so they are not discussed here.
15667	4	34	17	40	49	If we compare Greenland section against Antarctica section, these are very unbalanced - there is too much focus on Antarctica. Whereas to a certain extent this is understandable, particularly in view of so many new findings in relation to Antarctica, the split should be more balanced. [EUCE, Belgium]	The Antarctic section is now shorter, but remains more in-depth than the Greenland discussion, because the Antarctic literature has changed more so in terms of future projections.
4739	4	34	18	0		Please check throughout the report that explanations in parentheses - like this one of grounded ice - are included at first mention of a term. Quite regularly the explanation comes later. For these technical terms where an explanation is necessary, please check they are in the glossary. [Debra Roberts and Durban Team, South Africa]	An attempt has been made to improve this.
11457	4	34	18	34	22	This is just reiterating the details that have been discussed in previous sections, so it's not necessarily to reemphasize them again when this section should be dedicated to future projectiosn. [Anson Cheung, United States of America]	This text has been shortened.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
30047	4	34	18	40	38	This chapter is mostly focused on hydrofracturing and MICI, introduced by DeConto & Pollard 2016. These mechanisms and their importance for future sea-level rise are still unclear (as mentioned in Cross Chapter Box 6, page 58, line 14). It is important to discuss and assess these, however, further advances in research are currently underrepresented. [Ronja Reese, Germany]	The Chapter Team aggress that the potential importance of hydrofracturing and ice-cliff calving remain unclear. New, process-based evaluations of these processes do not exist, although much work is currently underway. More of the recent literature (Larour et al., 2019; Balthuis et al., 2019; Reese et al., 2018, etc.) has been added to the discussion.
30053	4	34	18	40	38	How do results from continental-scale modelling studies compare to regional modelling studies? The regional studies (using higher resolution, improved sub-shelf melt representation,..) mentioned in this section could help to assess the results from the continental-scale studies used for Antarctic sea-level projections (Golledge et al. 2015, DeConto et al. in review). [Ronja Reese, Germany]	This is a great suggestion, but no clear comparison has been made. DeConto, et al in review compare results over a range of resolutions from 10-1 km, but a direct comparison of models like PISM and DeConto et al., relative to regional-scale simulations (e.g., Cornford et al.,) is not possible, because the forcings are very different. The upcoming ISMIP6 results will in part help address this issue.
30057	4	34	18	40	38	Pattyn (The Cryosphere 2018) and Schlegel et al. (The Cryosphere, 2018) could be of interest for this section. [Ronja Reese, Germany]	The Chapter Team fully agrees. Schlegel has been incorporated into the SROCC projections.
416	4	34	27	34	35	Chapter 4, page 4-34, lines 27-35. I have an issue with the exact purpose of this paragraph and the papers that are cited. It seems like four statements are made at the same time: 1: Sea level rise is accelerating, this is observed by satellite altimetry, 2: The contribution of Greenland to the sea level is accelerating sea level rise, 3: The contribution of West Antarctica and the Antarctic peninsula is accelerating sea level rise, 4: Ice sheet dynamical thinning is affecting glaciers on the AP or the WAIS and this is the explanation for what is going on in Antarctica. I could go along all papers individually, but the way it is written should be improved. The phrase “Increasingly evident” on line 31 is actually not based on modelling, but more of a suggestion that the ocean is warming the ice sheet from beneath. The best demonstration is in (Wouters et al 2015) in their figure number 2 where the disparity between surface mass balance and GRACE is shown (both are modelled and observed, ice sheet discharge and basal loss is inferred). The explanation in (Wouters et al 2015) is that this is likely due to the intrusion of circumpolar deep water (CDW), but there is no modelling at this point. Other good suggestions for dynamic thinning are the retreat of the grounding lines as observed in (Rignot et al 2014). [Ernst Schrama, Netherlands]	Wouters is referenced, as is Khazendar et al., 2016

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26131	4	34	29	34	29	Here all mass loss processesother tham SMB are referred to as ice-dynamical (also elsewhere in the chapter). However, it this justified since the recognition that submarine melt is a major component of ice sheet mass loss. If the term is used at least it should be defined and made clear that it encompasses all mass changes other than through SMB. [Regine Hock, United States of America]	Agreed. Clarification on this point is now provided..
26129	4	34	29	34	31	Are all these references really needed? Are they ALL really presenting a partitioning between SMB and dynamic processes [Regine Hock, United States of America]	An attempt has been made to be inclusive.
11101	4	34	34	0		Why suggesting the anthropogenic contribution of it is simply unclear? Why in this context, where more basic knowledge of the Antarctica is still not yet being provided? [Valentina R. Barletta, Denmark]	This comment is not clear to the author team.
2581	4	34	37	34	37	poised -> positioned? [Michiel Van den Broeke, Netherlands]	Positioned is indeed more accurate.
33473	4	34	43	34	45	Additional citations: Nias, I. J., S. L. Cornford, and A. J. Payne (2017), Contrasting the modelled sensitivity of the Amundsen Sea Embayment ice streams, , 62(2016), 552--562, doi:10.1017/jog.2016.40; and Waibel, M. S., C. L. Hulbe, C. S. Jackson, and D. F. Martin (2018), Rate of Mass Loss Across the Instability Threshold for Thwaites Glacier Determines Rate of Mass Loss for Entire Basin, Geophys. Res. Lett., 45(2), 809--816, doi:10.1002/2017GL076470. [Government of United States of America, United States of America]	Agreed. These references have been added.
15141	4	34	54	34	57	The work of Timmermans and Goeller 2017 should also be mentioned here. Their conclusion about the impact of coupling ocean and ice sheet models is opposite to Seroussi et al. 2017 cited here. [Dewi Le Bars, Netherlands]	Agreed. This is a very good suggestion. This reference has been added along with some discussion.
33475	4	34	54	34	57	The overestimation of melt rates by parameterizations shown in this study is a bit of an artifact due to tuning of the parmeterization. It my be more accurate to simply say an uncoupled parameterization is inaccurate, and it would be helpful to quantify the level of inaccuracy. [Government of United States of America, United States of America]	The quantification of this uncertainty is not known and is spatially variable and model dependent. See above.
1505	4	35	0	0		Interesting and important question. Some more in depth discussion needed and a summary in the form of a figure listing all the challenges needed [Chandani APPADOO, Mauritius]	The Chapter Team agrees in principle, but space is limited.
33477	4	35	1	35	1	A reference to Asay-Davis et al. (2016), which is cited later in the section, seems perhaps more relevant than Asay-Davis et al. (2017). The former is specifically related to community efforst to study ice sheet-ocean coupling. [Government of United States of America, United States of America]	Reference is added.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33479	4	35	1	35	1	Additional references here: De Rydt, J., and G. H. Gudmundsson (2016), Coupled ice shelf-ocean modeling and complex grounding line retreat from a seabed ridge, J. Geophys. Res. F Earth Surf., 121(5), 865--880, doi:10.1002/2015JF003791; and de Rydt, J., P. R. Holland, P. Dutrieux, and A. Jenkins (2014), Geometric and oceanographic controls on melting beneath Pine Island Glacier, J. Geophys. Res. Ocean., 119, 2420--2438, doi:10.1002/2013JC009513.Received. [Government of United States of America, United States of America]	Reference is added.
29093	4	35	7	35	20	This is the best figure I have ever seen to express these complex processes at work (which I have struggled to explain visually to non-scientists) -- really well done and appreciated! [Pam Pearson, Sweden]	Appreciated.
26133	4	35	10	35	10	This figure would have been great in chapter 3. Chapter 4 very nicely explains the processes that a reader needs to understand chapter 3. This overlap/logic issue needs to be solved somehow. [Regine Hock, United States of America]	Agreed. This was the reason for drafting the ice dynamics cross-chapter box in chapter 3.
15069	4	35	10	35	20	Figure caption for Fig. 4.6 reads more like a paragraph from the main text. Consider rephrasing [Government of Germany, Germany]	The caption has been modified, although the Chapter Team prefers the existing content in the caption.
30033	4	35	10	35	20	Understanding of the figure could be improved by explaining the processes named or referring to the corresponding chapter or Cross Chapter Box. [Ronja Reese, Germany]	An attempt has been made to improve this.
33481	4	35	23	35	46	This paragraph should also mention this paper: Nias, I. J., Cornford, S. L. & Payne, A. J. (2018). New Mass-Conserving Bedrock Topography for Pine Island Glacier Impacts Simulated Decadal Rates of Mass Loss. Geophysical Research Letters 45(7), 3173-3181. [Government of United States of America, United States of America]	Agreed. Reference added.
24941	4	35	27	35	27	Consider to replace 'MISI-like' by 'sustained', as mentioned as well in the abstract of that particular paper. [Frank Pattyn, Belgium]	Agreed. "Sustained" is better.
19963	4	35	39	35	46	Repetitive 'also' . [APECS Group Review, Germany]	Fixed.
4743	4	36	8	0		>3.3m of GMSL rise - in Figure 4.5 it says "Thwaites contains enough ice to raise GMSL by ~0.4 m" - please clarify. [Debra Roberts and Durban Team, South Africa]	The former value (3.3m) is for all of WAIS. This is now clarified.
19965	4	36	11	36	15	This seems out of place. [APECS Group Review, Germany]	This section has been shortened and reorganized.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33483	4	36	20	36	21	"The PISM model links grounded, streaming, and shelf flow, has freely evolving grounding lines, and captures MISI dynamics." This statement would be strongly contested by many members of the glaciological and ice sheet modeling communities. In the simulations discussed here, PISM is NOT being run at high enough spatial resolution to accurately capture grounding line dynamics and/or MISI dynamics. While it does capture some of the essence of the behavior, it is clearly not doing so in an accurate way. As written, this sentence is very misleading. If this sentence remains in some form, it should be made clear that it is well known (and has been demonstrated) that the accuracy of these dynamics is highly suspect because of the coarse model resolution. [Government of United States of America, United States of America]	This text has been modified and shortened to make it clear that PISM uses simplified physics.
6313	4	36	23	0		Suggest replacing "to be" with "as" [Nina Hunter, South Africa]	The Chapter Team prefers the original wording.
5395	4	36	24	36	24	I suggest to add/change to this: as it is on Greenland "(Delhasse et al., 2018)." [Xavier Fettweis, Belgium]	Agreed. Reference added.
25663	4	36	34	36	34	When and if melt rates ; Not understandable [Government of India, India]	This section has been modified for clarity.
33485	4	36	35	36	37	"This is a key question, because ice shelf loss is associated with the onset of both the marine ice sheet and ice cliff instabilities." It is still not widely agreed upon in the community whether or not ice cliff instabiliy is an actual physical mechanism supported by both observations and models. Conversely, there is very widespread agreement regarding the marine ice sheet instability (i.e., it is generally considered to be supported by both models and observations). Therefore, discussing them on equal terms here is a little bit misleading in terms of giving the impression that they are both widely supported and agreed upon. [Government of United States of America, United States of America]	The text goes to great legnths to explain the uncertainty around MICI and its relationship to deep uncertainty.
28613	4	36	41	36	41	Suggest including the solid Earth in this list of components to be considered when studying interactions within the cryosphere [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. Excellent suggestion. Ice-earth interactions are discussed elsewhere in the text. A reference to Larour et al., (2019) has also been added.
27453	4	36	42	36	44	In Reese et al.,The Cryosphere 12, 3229-3242 it has been shown that the grounding line flux parametrisation is largely not valid present-day Antarctica. How does this feed into the choice of Antarctic projections in this chapter? Do Deconto et al (in review) use a Schoof-like grounding flux parametrisation? [Matthias Mengel, Germany]	Reese et al., point out that parameterized buttressing in hybrid-type models is an imperfect approuch... possibly overpredicting buttressing in some locations and overpredicting in others. The net effect at the continental scale remains unknown, and maybe less critical to simulations in which ice shelves are thinning or lost entirely. Reese et al., (2018) is now included in the discussion. DeConto et al., (in review) do use a parameterization of buttressing to account for the back stress imposed by pinning points and side shear. Any imposed bias on their results is unknown at this time, but may become more clear after completion of future model intercomparison studies.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
30043	4	36	42	36	44	Applying this parameterization to present-day Antarctic grounding lines was shown to yield partly unphysical results (Reese, Winkelmann & Gudmundsson, The Cryosphere, 2018). [Ronja Reese, Germany]	Agreed. See above.
28615	4	36	51	36	51	Consideration of the impact of spatially variable relative sea-level change (which influences the position of, and flux across, the grounding line) should be included in this list. E.g. See Pollard, D., Gomez, N. & DeConto, R. M. Variations of the Antarctic Ice Sheet in a coupled ice sheet-Earth-sea level model: sensitivity to viscoelastic Earth properties. J. Geophys. Res. Earth Surf. 122, 2124–2138 (2017). [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. Ice-Earth-sea level interactions are mentioned and a reference to the recent Larour et al., (2019) paper is added.
28617	4	36	54	36	55	I list here a couple of additional studies that present continental-scale models of Antarctic Ice Sheet evolution under future greenhouse gas scenarios. Unlike other studies listed here, they consider the impact of GIA-related processes on the rate of future Antarctic ice loss (although typically on timescales greater than just to 2100): (1) Pollard, D., Gomez, N. & DeConto, R. M. Variations of the Antarctic Ice Sheet in a coupled ice sheet-Earth-sea level model: sensitivity to viscoelastic Earth properties. J. Geophys. Res. Earth Surf. 122, 2124–2138 (2017). (2) Gomez, N., Pollard, D. & Holland, D. Sea-level feedback lowers projections of future Antarctic Ice-Sheet mass loss. Nat. Commun. 6, 8798 (2015). [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	References and some discussion on this topic are included.
33487	4	36	54	36	56	Somewhere in this section it is probably important to note that ALL of the models referenced here (and discussed in this section) are run at fairly coarse (~10 km or more) spatial resolutions, and thus are NOT likely accurate with regard to their representations of grounding line dynamics (and thus their representation of the marine ice sheet instability). This is a critical factor when considering how much confidence can be placed in these results, since a number of studies (e.g., Cornford et al., 2013, JCP, 232, pp529-549; Cornford et al., Ann. Glac. 57(73) 2016 doi: 10.1017/aog.2016.13) have conclusively shown that grid resolution on the order of ~1km or less is required to accurately simulate marine ice sheet grounding line dynamics. This concern applies, in particular, to the references discussed that use the PISM ice sheet model. [Government of United States of America, United States of America]	Agreed.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19967	4	36	54	40	38	The explanation and outcomes of all these models are very long and most of it is summarized in table 4.2. Does it have to be this extensive? Is the readers are interested in the details, they can look up the paper. [APECS Group Review, Germany]	This section has been shortened.
33489	4	36	56	40	49	At least 15 references are made to DeConto et al. (in review). Such heavy reliance on an as-yet unpublished paper by one of the coauthors of this chapter seems odd and a disproportionate emphasis. [Government of United States of America, United States of America]	Extensive reference to DeConto et al. is related to the debated, but possibly highly impactful brittle ice sheet processes they attempt include. It also provides a very different set of RCP results than their 2016 paper, so some discussion is warrented, although the point is well taken and the discussion has been shortened.
32479	4	37	2	37	42	Line 2 - continent-wide retreat AND thinning; linear 9 - could give approximate RF by 2100 to show roughly where it lines in the ordering? (as in comparison p40). Line 15 - "other physical processes" - please be more specific i.e. name MICI. [Tamsin Edwards, United Kingdom (of Great Britain and Northern Ireland)]	Changed to include "thinning"
32499	4	37	2	37	42	Line 2 - continent-wide retreat AND thinning; linear 9 - could give approximate RF by 2100 to show roughly where it lines in the ordering? (as in p40, 56). Line 15 - "other physical processes" - please be more specific i.e. name MICI. [Tamsin Edwards, United Kingdom (of Great Britain and Northern Ireland)]	See above.
33491	4	37	18	37	30	This paragraph includes substantially more detail on the model used and its details than the other paragraphs in this section. [Government of United States of America, United States of America]	Continental-scale models are discussed in great detail, because they provide the basis for the following projections.
30067	4	37	22	37	22	The application of sub-shelf melting in partially-filled grid cells along with the sub-grid grounding line interpolation scheme in PISM is optional. [Ronja Reese, Germany]	Agreed. The point is that the more sensitive sub-grid parameterization was used by Golledge et al., (2015; 2019).
15143	4	37	32	37	34	There is no change in SMB included in this approach, only dynamics. Also there is no explicit calibration of the model. Just a comparison of the final results with observations. Recent rates of retreat are not used at all in the paper. [Dewi Le Bars, Netherlands]	Agreed. The description of Golldege et al., has been adjusted.
9969	4	37	32	39	57	This section seems much less dense as a synthesis than the others (sometimes with whole paragraphs dedicated to individual studies), with a strong emphasis on the work of Pollard and Deconto. While this work is important and provocative, it appears to occupy a surprisingly large fraction of 4.3.2.1.2. Due to the relatively greater uncertainty in SLR and potential from Antarctica than Greenland, a longer section make sense. But the text seems presently a little out of balance. [Gwenn Flowers, Canada]	Agreed. This section has been shortened considerably.
11283	4	37	33	37	33	Add “linearized” to “the dynamic response” [Sybren Drijfhout, Netherlands]	While technically correct, 'linearized" will be esoteric to most readers without addition context.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32481	4	37	40	37	57	Line 42 - effect of hydrofracturing IS estimated in Ritz et al. so please correct this . Line 45- This conflates cliff failure process (Bassis and Walker) with hypothesised feedback (MICI) - please make this distinction clear in the text. The later part about ice-cliff calving is more clear (line 54). Line 47 - not at all clear that MICI improves Pliocene performance, given the large Pliocene uncertainties and emulation no-MICI estimates in (Edwards et al., 2019), or LIG for that matter... [Tamsin Edwards, United Kingdom (of Great Britain and Northern Ireland)]	Ritz et al., do account for hydrofracturing, but not directly with physically based parameterizations. The text has been changed, as has the discussion of MICI.
28401	4	37	40	39	29	This comment is copied verbatim from my FOD review: "There is a lot of discussion of a single study and MICI here, which feels disproportionate. Given the lack of evidence for MICI in Antarctica and the highly uncertain calibration/parameterization it doesn't seem warranted and is unbalanced. There are many other processes (that have been published on) that may be equally/more important. VLM is one (see e.g. Kingslake 2018 and Barletta 2018 and plenty of earlier studies). These studies suggest the potential for significant -ve feedback on GL migration due to VLM particulary for a weak WAIS mantle and thinner lithosphere. There are, however, several pages devoted to MICI and rather little on others." Five studies are discussed in this section, two by one of the LAs. Golledge 18 lines, Levermamm 7, Ritz 21 lines, Deconto >84 lines. It is then stated on p39 "We stress that hydrofracturing and ice-cliff processes have only been included in one continental ice sheet model." This section appears to be extremely unbalanced and extremely heavily weighted towards this one ice sheet model. This could be interpreted as a serious author bias. [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	MICI was discussed at length in previous drafts, because it is deeply uncertain, but potentially very impactful. The discussion of brittle glaciological processes has been reduced in this draft. The effect of low viscosity mantle has been explored somewhat (e.g., Pollard et al., 2017; Larour et al., 2019) with limited impact on short ~100-200 year timescales (Larour et al., 2019), and with limited impact on even longer timescales when under strong future warming (Pollard et al., 2017). Larour et al., (2019) do not directly account for viscous effects or the strength of negative ice-Earth feedback under warmer future scenarios with strong forcing. Other work has mostly relied on radially varying Earth models, but more work is needed with more realistic 3D Earth structure and very low viscosity mantle to make any firm statements about vertical land motion and self-gravitation as a negative feedback.
27449	4	37	54	0		these lines and other parts of this section read as if the hydrofracturing and ice cliff failure mechanisms are undisputed state-of-the-art in the ice modelling community. Though they are promoted by a small part of ice sheet scientists only, they take large space in this chapter (the terms have 28 an 29 word counts). For an outside reader, it is very difficult to grasp from the text that these mechanisms are still controversial in the ice sheet community. This should be better balanced. [Matthias Mengel, Germany]	Agreed. See comment above. This section has been shortened and modified to provide better balance.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11103	4	38	0	0		The De Conto under review (pag 38 line 26) and Parizeck et al (Submitted) (pag 38, line 2) are used to support the claim that the MICI is indeed relevant. While I am sure that this is the case, I do not think that it is correct to use works not yet published to support any claim, for two reasons. The first is that they have not been gone through a peer review process, and therefore their validity is still questionable. The second is that being still under review, and not therefore in their final version, they are not accessible to us, reviewers of the report, and therefore we are not given the possibility to do a proper evaluation. This is unethical. [Valentina R. Barletta, Denmark]	No unpublished work will be included in the final assessment. Parizak et al., 2019 is now published.
27455	4	38	6	0		The following paragraphs until the start of 4.2.3.2 are not scientifically balanced. MICI and MISI are still controversal in the ice sheet modelling community, but presented here as fully valid state of the art. [Matthias Mengel, Germany]	A strong attempt is made to emphasize the uncertainty around these processes, especially MICI. This section has been shortened substantially.
27017	4	38	6	38	8	The model of DeConto and Pollard has much greater surface meltwater production than other models which can simulate present-day SMB quite well - hence the hydrofracture, I believe. Is this plausible, in your judgement? You have relevant comments below about this. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. This issue is clearly noted in the text. The meltrate issue has been addressed in DeConto's more recent modeling work, but those results are still in review.
32483	4	38	6	38	24	"Accounting for ...MICI processes" - this implies MICI is a known process, not a hypothesis. Please rephrase e.g. "Including representations of hydrofracturing and cliff failure", or "Incorporating hydrofracturing and the proposed MICI feedback" or similar. Similarly line 23 "physical processes not considered". It seems DP16 are partly so high because of high surface warming/melting (based on our no-MICI estimate and DeConto and Pollard (in review) if I understand correctly (as per line 27 same page). [Tamsin Edwards, United Kingdom (of Great Britain and Northern Ireland)]	Agreed. Great suggestion.
6315	4	38	14	0		Suggest changing "don't" to "do not" [Nina Hunter, South Africa]	Agreed.
6317	4	38	17	0		Please check that "2500" is the intended year [Nina Hunter, South Africa]	Yes. Checked.
26139	4	38	26	38	26	What is 'ice-driving climatology'? [Regine Hock, United States of America]	Agreed. Too much jargon. This text has been changed.
11105	4	38	26	38	39	All this section discusses results exclusively from a single paper that is in review. We have to trust the words of the author of the report that is also author of the paper. This make it impossible for us reviewer to express any opinion. Even if the paper is then accepted before the deadline for the report, this section of the report will be "unreviewed", because at the moment of the revision it was not available. This is unethical. [Valentina R. Barletta, Denmark]	This discussion will not be included if the paper is not accepted by the IPCC deadline.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13951	4	38	36	38	38	The results as presented seem to suggest that RCP2.6 will result in greater GMSL by 2200 than RCP4.5. Are the results the presented the wrong way or is there a reason for this difference? Please unpack further if so. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The reviewer is correct. The wording has been rearranged.
32331	4	38	36	38	38	The predictions for 2200 seem to in reverse order, with the first, ostensibly for RCP2.6, greater than the second, ostensibly for RCP4.5. [Donald Boesch, United States of America]	Correct. See comment above.
10831	4	38	38	38	38	Is the order of RCP2.6 and 4.5 mixed up here? Or is the sea level rise really larger in 2.6? [Magnus Hieronymus, Sweden]	Yes. See above.
23721	4	38	38	38	38	Is the order of RCP2.6 and 4.5 mixed up here? (Or is the sea level rise really larger in 2.6?) [Government of Sweden, Sweden]	Yes. See above.
29091	4	38	38	38	38	Do these figures for 2200 GMSL inadvertently switch RCP2.6 and 4.5? One would expect RCP2.6 to be less (24), not more (36). [Pam Pearson, Sweden]	Yes. See above.
6319	4	38	46	0		Remove one "than" [Nina Hunter, South Africa]	Typo fixed.
33493	4	39	4	39	7	These two review papers would be appropriate to cite here: Asay-Davis, X. S., N. C. Jourdain, and Y. Nakayama (2017), Developments in Simulating and Parameterizing Interactions Between the Southern Ocean and the Antarctic Ice Sheet, Curr. Clim. Chang. Reports, 3(4), 316-329, doi:10.1007/s40641-017-0071-0; and Dinniman, M.S., X.S. Asay-Davis, B.K. Galton-Fenzi, P.R. Holland, A. Jenkins, and R. Timmermann. 2016. Modeling ice shelf/ocean interaction in Antarctica: A review. Oceanography 29(4):144-153, https://doi.org/10.5670/oceanog.2016.106. [Government of United States of America, United States of America]	Agreed. These references now replace Asay-Davis et al., (2016).
17139	4	39	4	39	17	Golledge et al 2019 (the one you have a draft copy of) does this with a coarse-resolution ocean model, so you could mention it perhaps? [Nick Golledge, New Zealand]	Good suggestion. Ocean feedback in Golledge et al., 2019 and implied by Bronselear et al., (2018) is mentioned.
33495	4	39	6	39	7	The reference to Asay-Davis et al. (2016) seems out of place here and should perhaps be replaced with Asay-Davis et al. (2017) and/or Dinniman et al. (2016). These latter two relate more to the role of ice sheet-ocean coupling in the broader climate, whereas the former is focused on the processes related specifically to ice sheet-ocean coupling. [Government of United States of America, United States of America]	see above.
11107	4	39	31	38	39	same as above [Valentina R. Barletta, Denmark]	see above.
17141	4	39	31	39	39	Given that these calving rates are unobserved (line 36), surely it is equally plausible that the rates could be lower than in Greenland? Should this be acknowledged? [Nick Golledge, New Zealand]	The Chapter Team agrees. Future calving rates in Antarctica could emerge in some outlets, at slower rates than observed in Greenland today. At very thick, unbuttressed ice margins, however, the stresses at calving fronts could exceed those at ice fronts like Jakobshavn- presumably with the potential to drive more fracture. Uncertainty in future ice-cliff calving rates is emphasized.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17143	4	39	31	39	39	It would be worth acknowledging here (or elsewhere in the section) the likely dependency of results on grid resolution. Do DeConto et al (in review) present convergence tests through a range of grid resolutions that could be shown here? It's just that we all know how sensitive grounding-line tracking is to grid size, and so I would imagine any other mechanism that essentially just removes mass at the ice margin might also be very susceptible to the cell dimensions employed. [Nick Golledge, New Zealand]	Yes. DeConto et al., (in review) test retreat rates at a range of model grid resolutions from 10 to 1km, with little impact in the results.
6321	4	39	37	0		Change "glaciers" to singular [Nina Hunter, South Africa]	Fixed.
27019	4	39	42	39	42	Why do you not include Levermann et al. (2014), who provide Antarctic projections to 2100 for all RCPs? Is it because they don't include hydrofracture due to atmospheric forcing? If so, I would note that Golledge et al. comment "ocean-forced perturbations produce the greatest ice-sheet contribution to sea level on centennial timescales (approximately five times that produced by increased air temperature alone when the full grounding-line scheme is used)". That suggests to me that Golledge is comparable with Levermann in effect. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	We do include this study now
32333	4	39	47	39	47	Again, are these estimates in the right order, with RCP4.5 greater than RCP8.5? [Donald Boesch, United States of America]	The values are from Table 13.5 in the Ar5 report and refer to the total (SMB+DYN) contribution, we clarified the text
26141	4	39	55	39	55	Instead of 'we conclude' (as done in a review paper), it would be better to use confidence language here: there is XXX confidence that … [Regine Hock, United States of America]	rephrased
4747	4	40	0	0		Table 4.2: recommend to use table cells rather than forward slash to separate values for clarity. Recommend redesigning table layout to match Table 4.5 which is more intuitive and makes it easier to compare values. [Debra Roberts and Durban Team, South Africa]	Reformatting like Table 4.5 is not possible given the large number of rows in the Table. Emphasis in the Table is on the different processes rather than the different numbers
17687	4	40	1	40	36	Unlike Chapter 3 this chapter does not consider the limiting impact of solid Earth and gravitational effects as discussed in several Gomez et al papers and also Barletta et al in Science. Eric Larour also has further work forthcoming. Delays of decades in THwaites is worthy of discussion [Matt King, Australia]	The recent paper by Barletta is discussed.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2505	4	40	5	0	20	Why is Levermann et al. 2014 not used? And what about Cornford et al. 1015. It does not consider EAIS but it does consider WAIS. And Ritz et al. it relevant, even though it is for A1B. And in the section on the long term there are a whole lot of studies implying lower rates of change, although I admit they may not adequately capture the potentially ast response. Is the projected increase in Antarctic snowfall explicitly included? [John Church, Australia]	The papers by Ritz which is only available for A1B and the paper by Levermann which only considers the ocean forcing are now included in the quantitative assessment.
27021	4	40	10	40	10	Why do you not include Levermann et al. (2014), who provide Antarctic projections to 2100 for all RCPs? [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	In the SOD this was not done because it only treats the ocean forcing component. In the FD it is included.
11109	4	40	10	40	20	Again, the Antarctica contribution in different RCP scenarios is assessed using only two studies: Golledge et al (2015) and DeConto et ail (in review). Even if the DeConto paper were already accepted, this would be an assessment based on only two studies. But since the paper is under review, we can only base our review on one single work, with its limitations. [Valentina R. Barletta, Denmark]	For this reason we have included the paper by Ritz, Levermann and Golledge 2019 in the assesment to achieve a more robust result
15611	4	40	10	40	20	Again, the Antarctica contribution in different RCP scenarios is assessed using only two studies: Golledge et al (2015) and DeConto et ail (in review). Even if the DeConto paper were already accepted, this would be an assessment based on only two studies. But since the paper is under review, we can only base our review on one single work, with its limitations. [EUCE, Belgium]	see previous
2583	4	40	10	40	38	The likely range is being defined based on one submitted paper that has not cleared review, and one paper that has been criticized as noted in the text. I don't see how this meets the usual standards of IPCC pdfs and calibrated language. The Fourth Assessment noted that some processes affecting ice sheets were not sufficiently understood to provide calibrated estimates. The Fifth Assessment provided calibrated estimates despite lack of proper physical representation of those processes, and the current report is following the Fifth. The reality is that the processes are not well-represented in models, but are known to be real. It would be much better for the current report to follow the Fourth Assessment. [Richard Alley, United States of America]	we now also include the papers by Ritz, Levermann and Golledge 2019 to estimate the dynamic contribution of Antarctica, by doing so we assess the current literature as good as possible. We realize that those studies have limitation and this is reflected in the calibrated confidence language.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27023	4	40	13	40	13	One possible criterion is the realism of the model. Usually we do not weight or exclude models, as there are many potentially conflicting criteria. However, in this case, with only two models, it seems to me that it's essential to consider whether they are equally plausible. Also, you could include Levermann et al. (2014) as well, I think (as I have commented on pages 39 and 40). [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	We have included Ritz, Levermann and Golledge et al. 2019, reject DeConto and Pollard 2016 and discuss how we weight the different studies.
6323	4	40	15	0		Change to "Golledge et al.'s" [Nina Hunter, South Africa]	sentence has been rephrased
13953	4	40	15	40	16	Using the difference between the "high" and "low" estimates of Golledge as a likely range seems very ad hoc. Suggest that you at least comment on how this range compares to the Levermann et al (2014) study and/or other estimates that have a larger ensemble with which to establish a distribution. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The procedure for assessing the uncertainty has been changed Levermann, Ritz and Golledge 19 are included now
16545	4	40	15	40	16	One recent study advocates using no melt for partially grounded cells.(Seroussi and Morlighem, 2018. doi.org/10.5194/tc-12-3085-2018) [Robert Arthern, United Kingdom (of Great Britain and Northern Ireland)]	reference has been included
6325	4	40	16	0		Make "estimate" plural [Nina Hunter, South Africa]	rephrased
2975	4	40	20	40	20	The sentence "The likely range is the 17–83 percentile of this combined distribution" is not clear: either we have confidence in the probabilistic description of uncertainties and there is no need to refer to the likely range (as defined in the IPCC uncertainty guidances, Mastrandrea et al, 2010), or we have limited confidence in the probabilistic outcome and we need a sentence like: "we interpret the 17th-83rd percentile level of this combined distribution as the likely range of future Antarctica contribution to GMSL" (note that in some other places of this chapter (e.g., p42 L16, the wording is perfectly aligned with the IPCC uncertainty guidances) [Goneri Le Cozannet, France]	rephrased at another location in the paragraph
10217	4	40	20	40	20	In AR5, the "likely range" is defined as the 5-95% range (Ch.13, Section 13.5.1). Alignment in the definition of "likely range" is needed. [SAI MING LEE, China]	The footnote at the beginning of the chapter explaining what the likely range is is adjusted
13955	4	40	22	40	27	It seems to me that in the presence of self-sustaining feedbacks one expects the distribution to be non-Gaussian. Rather than saying we "judge the distribution to be Gaussian", why not state that you simply make this assumption for the purposes of the projections? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	we now include more studies and do not have to make this assumption any longer
4745	4	40	23	40	26	Perhaps use 'normal' rather than 'Gaussian', it is just a little more common usage. [Debra Roberts and Durban Team, South Africa]	Gaussian is not used any longer

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2991	4	40	24	40	24	I do not understand the world "modest" here since, at least according to the french climate service DRIAS, A1B is similar to RCP 6,0 in terms of greenhouse gaz emissions (?). http://www.drias-climat.fr/accompagnement/section/175; Otherwize, this section 4,2,3,1,2 is very clear for non-experts. [Goneri Le Cozannet, France]	modest is not used any longer
2171	4	40	25	40	27	Is this a judgement or a convenient approximation? A reasonable case can be made for the latter, but I am skeptical of the former. [Robert Kopp, United States of America]	this was a convenient approximation, but we now use more studies and don't need to make this approximation any more
2511	4	40	26	0	27	Is there really a good basis for the Gaussian distribution. While an individual study may have a Guassian distribution, I would have thought that the large differences between different studies and the deep uncertainty referred to several times would imply a skewed distribution. [John Church, Australia]	see previous comment
15145	4	40	29	40	30	I think this is a mistake, the range from Levermann et al. 2014 as recalled above in the section is 1cm-37cm (only shelves models). So there is no lower limit at 10cm. [Dewi Le Bars, Netherlands]	yes this was a typo, but is not any longer used
15149	4	40	31	40	34	So why is the expert judgement discarded and two numerical models preferred for the projections? This important choice should be motivated. [Dewi Le Bars, Netherlands]	we do not exclude the expert judgement and use is a context for the process based results
15147	4	40	32	40	32	I think this should be Bamber and Aspinall 2013 [Dewi Le Bars, Netherlands]	correct and not correct both 2013 and 2019 need to be mentioned
2507	4	40	41	0		Why is Levermann et al. 2014 not used? And what about Cornford et al. 1015. It does not consider EAIS but it does consider WAIS. And there is no comment that both of these models apparently do not include the stabilising influence of sea bed rebound from the low viscosity WAIS. [John Church, Australia]	Levermann is used now. Cornford is not used as it is West-Antarctica only for a prescribed basal melt rate not associated to RCP scenarios
32335	4	40	41	40	42	The table caption should indicate the period over which the change in GMSL is estimated, i.e. from 2000 or is it 1986-2005?. [Donald Boesch, United States of America]	we adjusted the caption to the full 20th centur hence reference is 2000
30051	4	40	41	40	49	Please add estimates of future sea-level contributions from regional modelling studies that are mentioned in section 4.2.3.1.2. [Ronja Reese, Germany]	unclear what is requested here
11285	4	40	41	41	1	“GMSL” is only the Antarctic contribution here. It has a different meaning than “GMSL” in Table 4.3 and the same meaning as “Antarctica” in Table 4.3. I suggest replacing “GMSL” with “Antarctica” in Table 4.2 [Sybren Drijfhout, Netherlands]	adjusted accordingly
15071	4	40	49	41	1	Table 4.2 is too complicated. Please consider to repeat the title line between the GMSL estimates and the listing of features treated differently in the 4 papers or split into 2 separate tables. [Government of Germany, Germany]	we want to express that numbers are to be associated with very different physics, so we prefer to combine them in one Table
6327	4	41	0	0		"parameterized" to start with a capital letter for consistency [Nina Hunter, South Africa]	adjusted accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
24855	4	41	0	42		The text does not explicitly mention anything about values of GMSL outside the likely range. This has high focus from policy makers, and is thus important for scientific advise e.g. to local governments. I suggest that it is clearly stated that this report either do not deal with values outside the likely range, that the distribution can be considered gaussian also outside the likely range, or a text similar to the AR5 on the risk of higher contributions from Antarctica, if this still applies. [Kristine Skovgaard Madsen, Denmark]	This is discussed after Table 4.3
25733	4	41	1	41	40	Strengethening the section on traditional knoweldge/indigenous knowledge in addressing the impacts of climate change on high mountain regions [Government of India, India]	This is about Antarctica not about high mountain regions
19971	4	41	3	47	9	Sections 4.2.3.2 and 4.2.3.3: The separation between Probabilistic Sea Level Projections (section 4.2.3.3) and "non" Probabilistic Sea Level Projections (section 4.2.3.2) seems to me too artificial. The CMIP5 projections are also probabilistic in the since that they provide a range of uncertainty. Why not to merge 4.2.3.3.4 (Recent probabilistic and semi-empirical projections) with section 4.2.3.3 (Probabilistic Sea Level Projections) into one section and call it: “Recent probabilistic and semi-empirical projections”? [APECS Group Review, Germany]	process-based up to 4.2.3.3 need to separated from probabilistic because the probabilistic studies often rely on processes here and not just Antarctic which are the scope of 4.2.3.2. Probabilistic should also not be merge with semi-empirical because it is based on a different line of thoughts.
15073	4	41	3	48	55	While we understand that SROCC is based on CMIP5 results, and it would be challenging to include a full discussion of RCP1.9 for SLR here, or amend Table 4.3 to that end, it would still be very useful to provide some context and line of sight to SLR-projections presented in the recent IPCC SR1.5 for very low stabilization scenarios, in addition to the very general explanation given in Section 4.1.2. [Government of Germany, Germany]	We don't have new CMIP results so we have to rely on AR5 data for all other components except Antartica. The difference between 1.5 and 2 degrees is estimated to be 10 cm in the 1.5 degrees report here we focus on the difference between RCP2.6 and RCP8.5
32339	4	41	3	88	55	Care should be given in both text and tables to always make it clear the baseline year or years from which the projections are given and also to indicate when it is GMSL rise that is being discussed rather than GMSL itself. [Donald Boesch, United States of America]	The wording in Table 4.2 has been adjusted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27459	4	41	5	0		The section 4.2.3.2 on global sea level projections is extremely short. I feel the general reader would be interested in a more detailed discussion on how the authors reach their choice of sticking with IPCC AR5 projections, and short summaries of post AR5 updates and the reasons why they are not used to update the numbers, except for Antarctica. Such summaries would give a more linear structure and help readers to more quickly understand the updates (or non-updates) on global slr projections. The brevity of half a page is in particular striking in comparison to the detail given to the Antarctic ice of almost 7 pages. [Matthias Mengel, Germany]	We see the point from the reviewer but the new estimates for Antarctica follow from the section 4.3.2.1 and in fact 1.5 page before the end we already start with assessing thevalue for the Antarctic contribution so in fact the sea level assessment is not just half a page but two pages. We reorganized the section to balance this better.
26145	4	41	5	41	6	unclear sentence: what is 'other'? Other than what? [Regine Hock, United States of America]	rephrased
2173	4	41	5	41	17	Given the limited degree of confidence in the Antarctic projections, would it make sense to downgrade the likelihood, as for example is done in AR5 for GCM-based projections, using 1.66σ from the Gaussian distribution as the likely range? [Robert Kopp, United States of America]	Yes we downgrade the 5-95% percentile to the 17-83 percentile
19969	4	41	5	41	17	The study of Marzeion, Ben, Kaser, Georg, Maussion, Fabien and Champollion, Nicolas (2018). Limited influence of climate change mitigation on short-term glacier mass loss, Nature Climate Change, 10.1038/s41558-018-0093-1, seems appropirate here. [APECS Group Review, Germany]	We are not discussing changes for small glaciers here, so there is no need to refer to this paper here. Differences for small glaciers are not very different from the Church et al. 2013 findings.
26149	4	41	5	41	17	While the preceeding text has been crystal clear and well written, this paragraph is confusing and needs revision. What is done/shown now? [Regine Hock, United States of America]	this section has been rewitten
27025	4	41	5	41	17	I am very concerned about your assessment of a higher end to the "likely" range, especially for RCP8.5, due to the Antarctic dynamic component. If I understand correctly, this is mostly because of DeConto and Pollard i.e. it is due to one model, not two models, because Golledge is much nearer to Levermann and AR5. By including an effect of DeConto and Pollard in the likely range for 2100, you are implying that, in your assessment, collapse of the major ice shelves, and perhaps MICI, lie within the range of "likely" outcomes. I do not think that is a correct assessment of the evidence of the post-AR5 literature, which is mostly consistent with AR5. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	The assessment is now based on ritz, levermann, golledge 2019 and Deconto 19. Results are not in conflict with AR5. We here assess the dynamic contribution of Antarctica to be 17 cm. The difference is just that we include this in our assessment. In AR5 the potential additional contribution which could not be precisely quantified in the projections was estimated to be not more than several tenths of a meter, here we assess this value to be 17 cm (5-95 percentile; 0-40 cm).
26147	4	41	7	41	8	remove or reformulate; this sentence makes little sense for a reader [Regine Hock, United States of America]	sentence removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27863	4	41	8	41	10	The sentence reads "Hence, we have constructed…". Does this mean that the results presented (in Table 4.3) have been conducted by the writing team and are not yet published or in some report document? [Zelina Ibrahim, Malaysia]	no it is based on post AR5 literature we clarified this
15151	4	41	20	41	20	The projections for RCP2.6 and RCP4.5 show a reduction in the uncertainty compared to AR5. This should be pointed out and discussed. The reason seems to be due to the reduced uncertainty from Antarctica. Why is that? [Dewi Le Bars, Netherlands]	We don't consider this to be significant and is simply the consequence of using different studies for the assessment
15153	4	41	20	41	20	The contribution of Antarctica to sea level rise for RCP2.6 is 0.04 (0.03-0.05) meters. This means that under this scenario the current rate of mass loss (0.06 m/century, IMBIE team 2018) is expected to stabilise and even slow down. Yet I do not see any reason for that in the section 4.2.3.1.2. [Dewi Le Bars, Netherlands]	That is correct but we have to base the assesment on existing literature and only the study by Deconto 2019 use the present-day imbalance as a constraint for their simulation. Ice dynamical models are not really accurate enough to use this as a constraint. We have added a sentence reflecting on this
26151	4	41	20	41	20	Why are AR5 glacier projections taken instead of the GlacierMIP results that include a more comprehensive and systematic treatment of the data in the literature and includes updates and new simulations? Using AR5 seems a step backward when new studies/numbers are available. Also for Greenland. It is a disappointment if a report to be published 6 years after AR5 has an entire chapter on sea level rise but can not do better than using AR5 numbers for almost all components. [Regine Hock, United States of America]	Numbers are not very different for the Non-Antarctic components. Glacier values and Greenland values are changes a little. Steric results are not changed at all. New is that we can now assess a value for the dynamic contribution of Antarctica which has a considerably uncertainty. Including those two aspects explains the difference in our current understanding.
10219	4	41	20	41	26	Re: Table 4.3. To allow for a complete assessment across various RCP scenarios, please include projections of GMSL for RCP6.0. [SAI MING LEE, China]	The ice dynamical studies usually don't have RCP6.0 information, so we could not consistently assess this
3017	4	41	20	42	2	For all components of sea level rise, a likely range is provided. If the definition of the likely range follows the uncertainty guidances of the IPCC (i.e., probability > than 66%), the likely range of GMSL should be computed as the sum of the likely range of each component. This would result in a likely range of [0.39;1.2] instead of [0.47;1.09] (RCP8.5 2081-2100). Is there any reason for summing these likely ranges as if they were probability distributions? Here, I understant that GMSL was computed as in AR5, assuming probability distributions for each component of sea level rise. In this case, why not just providing probability metrics for each component and not a likely range? For example, if the latter option is prefered, the recommendations 11.D, 11.E and 11.F of the IPCC uncertainties in Mastrandrea et al 2010 could be useful. [Goneri Le Cozannet, France]	The uncertainties propagation is done nearly identical to AR5. Summing the Antarctic contribution to the other components is for sake of transparency done fully independent as is close to the global mean values in AR5, but not exactly the same. As the projections lean on the CMIP5 work presented in AR5 we interpret the results of the 5-95 percentile as by Church et al. 2013 to represent the likely range, i.e. the 17-83 percentile.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
23945	4	41	20	42	2	In Table 4.3, the titles on line 7 (Total - Antarctica AR5) and line 8 (Total AR5 - Antarctica AR5) should be the same. [Government of Japan, Japan]	corrected accordingly
25247	4	41	20	42	2	(Related to the previous comment.) The projections for the GIS in Table 4.3 are not consistent with the assertions that Greenland's "dynamic contribution to sea level may be limited" (page 33, line 21) and that "future Greenland ice loss will be dominated by surface processes" (page 34, line 6). The Table shows that, under scenarios RCP2.6 and 4.5, the dynamic contribution is equal to the SMB contribution. This needs to either be clarified in this section or clarification should be added to the assertion in the paragraph on page 33, lines 14-27, and the paragraph on page 34, lines 5-15 (see my previous comment). [Denis Felikson, United States of America]	yes the statements are not fully consistent and we will adjust the text at page 33 ad page 34.
25249	4	41	21	41	21	Change "rates for 2046–2065 are mentioned" to "values for 2046-2065 are mentioned". [Denis Felikson, United States of America]	corrected accordingly
28619	4	41	21	41	22	Rates for only one time period are listed in Table 4.3 (the caption suggests rates for both 2046-2065 and 2100 are listed) [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	the caption is adjusted
25251	4	41	23	41	23	I would suggest changing "Total—Antarctica AR5" to something like "Total without Antarctica AR5" or something similar so that readers do not confuse the minus sign for a hyphen. [Denis Felikson, United States of America]	the title of row 6 and 7 are made identical to prevent confusion
15075	4	41	23	41	25	The last sentence is odd. It is too difficult to understand how 'Total-Antarctica AR5' is computed, please revise. [Government of Germany, Germany]	The caption has been adjusted
25253	4	41	23	41	25	This sentence needs to be reworded: "Total—Antarctica AR5 is the GMSL contribution in Church et al. (2013) without the Antarctic contribution of Church et al. (2013) to this the newly derived Antarctic contribution is added to arrive at the GMSL." I believe it should be split into two sentences, such as: "Total—Antarctica AR5 is the GMSL contribution in Church et al. (2013) without the Antarctic contribution of Church et al. (2013). The newly derived Antarctic contribution is added to arrive at the GMSL." [Denis Felikson, United States of America]	changed accordingly
4749	4	42	0	0		Figure 4.7 - For policy makers it might be interesting to see projections post-2100, as 80 years is not such a long time in terms of urban development for example. Major developments done today will still be around in 80 years. Why the 17-83% confidence interval? Please explain. Is that because this interval corresponds roughly to the 2-in-3 chance? [Debra Roberts and Durban Team, South Africa]	The longer time scale is addressed in a different paragraph as stated. "For each of these contributions, 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). For consistency with the treatment of the CMIP5-derived results, we interpret this range as the likely range" (Church et al. 2013). We follow in SROCC this approach as well. This is clarified in the text.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15669	4	42	1	42	24	Table 4-41: What happens to Antarctica and GMSL between 2066 - 2080? The table does not account at all for this period, however Figure 4,7 does? This is inconsistent, and even if basic linear regression is used it should be specified. [EUCE, Belgium]	The full time series is shown in Fig 4.7. The Table just provides some numbers for characteristic time slices which are used throughout the report
27865	4	42	5	42	9	Are the results presented in Figure 4.8 from research carried out for this chapter? Is the information in the process of submission for publication? [Zelina Ibrahim, Malaysia]	Results in Figure 4.8 are simply the regionalization of the GMSL including the gravitational and rotational effects and is a standard approach as used in AR5 and several publications. We adjusted the text to explain this better.
27457	4	42	8	0		“Results of SROCC are consistent …” I do not understand this sentence. Please clarify. [Matthias Mengel, Germany]	This has been clarified
13957	4	42	10	42	16	Figure 4.7. The grey scale bar could be improved as it is hard to see. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The quality of the figure is improved
17247	4	42	10	42	18	This is a very important figure for this report, so I think it needs a bit of attention. It seems like the individual panels could be larger, as well as more clear. The font is quite small at present. I suggest some simple changes to make the plot easier to read, including increasing font and panel size, and possibly using a darker shading for the AR5 values. [Andra Garner, United States of America]	The quality of the figure is improved
10339	4	42	13	42	16	Which of these RCPs is the most realistic? Closest to the actual?? [Mahmood Riyaz, Maldives]	There is no likelyhood assigned to RCP scenarios
2175	4	42	16	42	16	Since this isn't really a measure of statistical confidence, would it make sense to refer to it as a "probable" or "credible" interval? [Robert Kopp, United States of America]	We prefer likely range and define this in the beginning of the chapter.
27035	4	42	20	0		Since there is a large uncertainty in the rate of SLR at 2100, there must also be a large uncertainty in the rate, but none is shown in the last row of the table. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	We added an uncertainty to this number
13959	4	43	0	43		Figure 4.8. There is very little information in this figure as it stands - essentially different magnitudes of the same pattern are seen in each of the 6 panels. I would suggest you show only RCP2.6 and RCP8.5, to show the range of scenario outcomes, and also present a map of the ensemble spread or standard deviation (for at least one of the time-slices shown). [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	We follow the suggestion of the reviewer and leave out the results for RCP4.5. The second suggestion is interesting but we don't have the data to do so. This can only be done for the thermal expansion componentbut that is only confusing so we can not do this.
592	4	43	1	43	6	Is it possible to use a separate inset and colorbar for the Hudson Bay? It takes away contrast from everything else. A title would be nice. [Jenna Pearson, United States of America]	We have improved the figures in line with the style guide from IPCC

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29095	4	43	1	43	6	Really excellent figure -- not only does it express the difference between the impacts of these emissions scenarios, but also expresses the important concept of time lag visually: that RCP2.6 by 2100 still is greater than RCP8.5 in the previous two decades. Is there however any way (sufficient underlying work) to expand this figure out to 2200 or 2300, where the differences will express even more? [Pam Pearson, Sweden]	There is indeedno enough material to do this up to 2200 at this stage. It would require CMIP runs up to 2200, 2300 for all different components, possible this will be available for AR6.
15077	4	43	3	43	3	Please consider to write out Extreme Sea Levels instead of using acronym ESL [Government of Germany, Germany]	corrected accordingly
16351	4	43	3	43	3	This very important Figure 4.8 on regional RSL change is included under 4.2.3.2 'Global Projections of Sea Level Rise' which does not make any sense. Why does the Chapter not provide crucial regional sea level projection information in one place? AR5 WGI Chapter 13 dedicated 10 pages for the coverage of regional information. SROCC provides about 4 pages including ESL, which seems to be a bit weak given that it is supposed to be a special report on ocean & cryosphere. [Alexander Nauels, Germany]	We agree that the header of the paragraph is misleading and we have adjusted this. At the time of writing AR5 the possibility of regionalizing sea level was a new step in the literature which was important to report on. Since AR5 there is little progress in this field and it is considered as a well developed technique so we spent a figure to it, but not 10 pages like in AR5.
3637	4	43	3	43	12	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	corrected accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2177	4	43	9	47	8	The purpose of this section in the text isn't really clear (and I originally wrote it, not quite in its current form). I would argue the main point of the section *should* be to summarize the integrated sea-level rise projections published in the literature since AR5 (as done in Horton et al 2018 and Garner et al 2018, doi:10.1029/2018EF000991), and the unsubstantiated critiques thrown in (for example, page 43, lines 16-20) should be dropped. Most of these projections are probabilistic or semi-empirical in the sense of Garner et al 2018 and Horton et al 2018, though some are 'central range' (Horton et al 2018) or 'model synthesis' (Garner et al 2018) studies. I recommend expanding the section to cover this third category as well -- and, again, dropping snide comments, which are both inappropriate (IPCC shouldn't make assertions like "They achieve this by applying statements for the Antarctic ice sheet contribution based on a single study and or by ignoring that other climate variables are only presented with a limited likely range as well. As such these probabilistic studies present full probability density function, but they make a priori assumptions violating the idea that a probability density function captures the full range," without presenting an interpretable and documented arugment, and given that most of the published integrated projections since AR5 are probabilistic, this evidence should also be fairly strong to go against the weight of the peer-reviewed literature. Similarly for overly broad and unsubstantiated claims like " Less and less value is given to semi-empirical models given the ongoing advances in closing the sea level budget and in the process understanding of the dynamics of ice.") Some of this section has been rendered incoherent by simultaneously arguing two opposing views without reconciling them (e.g., "differences between semi-empirical and process-based models … are vanishing", but semi-empirical models "poorly capture … recent observed changes in Antarctica" -- Is this true? I see no evidence for it, though I do see evidence that semi-empiricla models are not as fat-tailed as process-based projections including MISI/MICI). This incoherency often occurs in paragraphs where the opposing views often are not presented sequentially but insteasd intermeshed, as though reviewer comments were directly inserted without regard to coherency or paragraph structure. [Robert Kopp, United States of America]	The purpose of the section is to illustrate that there are other approaches than the process based approach used for the sea level projections which provide context for those results. They typically don't provide new independent estimates of the Antarctic contribution. As such it is important to mention that some probabilistic studies are the result of a priori assumptions for sea level like the DeConto and Pollard 2016 study and therefore not provide independent new evidence for a very high sea level rise. We improved the writing to clarify this
6329	4	43	17	0		Should "and or" be written "and/or"? [Nina Hunter, South Africa]	this part of the sentence has been removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15155	4	43	17	43	18	“by ignoring that other climate variables are only presented with a limited range as well”. I do not think any of these “probabilistic” projections “ignores” this decision from AR5. But this is just a decision from AR5 authors, it is arbitrary in the sense that the uncertainty increases towards the extremes but there is no tipping poing happening at 66% likelihood. One cannot say that the likely range is known perfectly and the very likely range is completely unknown. These probabilistic projections acknowledge that the extremes of the probability distributions are less and less well constrained but where to stop is not up to scientists only, it depends on the use so users also have a key role to play. [Dewi Le Bars, Netherlands]	the fact that probabilistic estimatess are useful for risk management is acknowledge a few sentences lower. The text has been rephrased to clarify this.
15157	4	43	18	43	20	This sentence is not clear, captures the full range of what? [Dewi Le Bars, Netherlands]	the full range of uncertainties. Sentence has been clarified as such.
27461	4	43	18	43	20	This sentence is confusing. Does it mean that probabilistic projections in their current form are not valid? [Matthias Mengel, Germany]	They are useful but conditional on a priori assumption like the study by LeBars. The reason that valaues for SLR are high is because they use DeConto and Pollard 2016. For risk assesments this is still valid information as mentioned a few lines lower. The text has been rephrased to clarify this.
21817	4	43	23	43	24	Wording is ambiguous - implies that a full pdf is now available for SLR - whereas probabilistic approaches referenced ar for individual RCPs, including Le Bars et al (2017), which was for the high-end RCP8.5. This aspect is creating confusion with practitioners and stakeholders that somehow there is a now available a "full pdf" of SLR projections by 2100 - however probabilities can't be assigned to each emission pathway due to deep uncertainty on progress of GHG mitigation (see Box 4, Chapter 1) [Robert Bell, New Zealand]	We stressed the point that probabilistic approaches are conditional given the climate scenario followed.
15159	4	43	26	43	26	I think the paper cited is not about possibilistic framework. [Dewi Le Bars, Netherlands]	This is correct the reference is wrong and corrected should be Cozannet et al. 2017
3019	4	43	26	43	27	"An even more general approach has been taken by Cazenave and Cozannet (2014) who frame a possibilistic framework of sea level rise including existing probabilistic estimates and combining them.": thank you form mentioning our work. However, in fact, the reference Cazenave and Le Cozannet (2014) does not proposes this approach, and the sentence seems to refer either to "Le Cozannet et al 2017" (already in the reference list) or to a submitted paper, which may be published before the IPCC SROCC deadline (link to open archiv: https://osf.io/6j4y7/). [Goneri Le Cozannet, France]	see previous comment

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
24023	4	43	27	43	41	Suggest using the word 'resettlement' instead of 'accommodation'. Use of the word retreat suggests moving inland - this is not the case for atoll nations who are geographically unable to do so. Suggest inclusion of LLCs in general in the sentence referencing megacities to highlight overall vulnerabilities. [Lagipoiva Cherelle Jackson, Samoa]	unclear where this refers to page 43 has only 27 lines
6331	4	44	5	0		"component to" - should it be "components of"? [Nina Hunter, South Africa]	components is what is intended so no change
19973	4	44	11	44	11	"CMIP5 AOGCMs" should be "CMIP5 GCMs". [APECS Group Review, Germany]	corrected accordingly
6333	4	44	14	0		Suggest placing "e.g. ... 2005" in parentheses [Nina Hunter, South Africa]	we changed the sentence slightly to clarify
10341	4	44	14	44	14	"Smaller than 10cm" how significance is this discripencies? [Mahmood Riyaz, Maldives]	the difference is illustrated by the numbers in the rest of the sentence, it should be interpreted as an estimate because the numbers have different uncertainty definitions and a different base period
17249	4	44	27	44	27	What does "EG" mean? Is this an abbreviation for something? Or was this line simply meant to read "models, e.g., Wada et al., 2012, or neglected"? Please clarify. [Andra Garner, United States of America]	typo corrected
25255	4	44	33	44	35	Because the first sentence begins with "Existing GMSL projections rely upon some combination of ..." it should be combined with the next sentence. And "structured expert elicitation" should be numbered, such as, "(2) structured expert elicitation." [Denis Felikson, United States of America]	corrected accordingly
2179	4	44	33	44	47	The original enumeration in this paragraph of approaches has been incomprehensibly mauled. [Robert Kopp, United States of America]	unclear what the reviewer means, but we have rephrased the paragraph such that it is easier to understand
6335	4	44	33	44	47	Rows 33 to 39 are in present tense and rows 39 to 47 in past tense. Is it possible to not have this difference? [Nina Hunter, South Africa]	changed as much as possible to be consistent
10343	4	44	33	44	47	Which of these approaches are usd in this study? Or which approach you favour? [Mahmood Riyaz, Maldives]	for the assessment in 4.2.3.2 we use new process-based studies in this paragraph we discuss alternative procedures to arrive at an estimate for GMSL
2977	4	44	38	44	38	"The 5%–95% range from the models was interpreted as the likely range from 17%–83%": I do not understand this sentence: does this mean that the 5%-95% range from the model is interpreted as the likely range (i.e., probability larger than 66% as defined in Mastrandrea et al (2010)), or that it is interpreted as the 17th-83rd percentiles of a particular distribution (e.g., Gaussian?). I suggest rephrasing: "The 5%–95% range from the models was interpreted as the likely range" refering to the definition in the IPCC guidances for uncertainties (Mastrandrea et al 2010). [Goneri Le Cozannet, France]	this phrasing has been removed here

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17251	4	44	39	44	39	Here, the authors refer to "Approach (2)", though, above, neither option is actually referred to as "Approach (2)". The authors discuss "(1) past expert assessment. . .", but then for option (2), simply say, "Alternatively, structured expert elicitation . . .". Please amend this, to avoid confusion later when discussing "Approach (2)". [Andra Garner, United States of America]	this has been corrected
24025	4	44	42	44	54	For SIDS and some LLCs there is evidence of a consultative and inclusive process through NAPA, NDCs and some SGP projects - that ensures low lying area communities. [Lagipoiva Cherelle Jackson, Samoa]	unclear where this refers to possibly other page?
9609	4	44	52	44	52	Referenced section should be 4.2.3.1.2, not 4.3.2.1.2. [Government of France, France]	corrected accordingly
29923	4	44	52	44	52	misnumbered reference -- intended to be 4.2.3.1.2 [Anna Zivian, United States of America]	see previous
3639	4	44	54	44	55	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	corrected accordingly
15671	4	44	54	45	5	Section 4.2.3.3.2 ought to make explicit the difference between vertical and horizontal GIA effects. Whereas it does so with the former, the latter is more vague and not as clear. [EUCE, Belgium]	we added horizontal to clarify this
28621	4	44	56	44	57	Given that 'GIA effects' are also used to describe the processes associated with point (3) of this sentence (beginning of next page), and noting the heading on line 15 of page 45 of this chapter, I suggest removing all reference to the term 'GIA' in point (2) and just referring to "gravitational and rotational effects caused by redistribution of..." [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	we follow that suggestion
19975	4	45	2	45	4	How can the inverse barometer effect contribute? [APECS Group Review, Germany]	if the atmospheric pressure changes the sea level changes
6337	4	45	3	0		Change "particular" to "particularly" [Nina Hunter, South Africa]	changed accordingly
27027	4	45	7	45	7	Gregory et al. (terminology paper) call this "ocean dynamic sea level change," to be clear it doesn't mean mantle dynamic topography. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly
24027	4	45	14	45	19	Should include the words "localising" in addition to institutionalising - as this is a fundamental aspect of the SDGs - sustainability. [Lagipoiva Cherelle Jackson, Samoa]	unclear what the reviewer mean probably wrong page number
3641	4	45	15	45	15	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	changed accordingly
27029	4	45	15	45	22	I think you should include solid-Earth deformation here as well, due to contemporary change in land ice mass. Gregory et al. (terminology paper) refer to gravitational, rotational and deformational contributions together as "GRD". [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly
19977	4	45	18	45	18	Include some examples of regions with low mantle viscosity. [APECS Group Review, Germany]	we refrain from expanding the text, we try to shorten it
6339	4	45	20	0		Change "purpose" to "purposes" [Nina Hunter, South Africa]	changed accordingly
10345	4	45	20	45	22	Can you provide a figure/map based on this [Mahmood Riyaz, Maldives]	we refer to Larour et al. (2017)

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3021	4	45	24	45	24	I suggest replacing "long term solid earth processes" by "vertical ground motions": "solid earth processes" can refer to geological processes of the internal structure of the Earth, which are not relevant to the topic in Chapter 4. Furthermore, the whole paragraph makes the point clear that vertical ground motions can be non linear (another example would be earthquakes, e.g., Ballu et al., 2011 PNAS); therefore, long term seems not needed. Ballu, V., Bouin, M. N., Siméoni, P., Crawford, W. C., Calmant, S., Boré, J. M., ... & Pelletier, B. (2011). Comparing the role of absolute sea-level rise and vertical tectonic motions in coastal flooding, Torres Islands (Vanuatu). Proceedings of the National Academy of Sciences, 108(32), 13019-13022. [Goneri Le Cozannet, France]	changed accordingly
3643	4	45	24	45	24	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	changed accordingly
27031	4	45	24	45	31	If this is "long-term", you could call it GIA and tectonics. Later in the paragraph you mention groundwater and hydrocarbon extraction, but those are not "long term" so they don't belong here. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we changed it to vertical land motion
28403	4	45	24	45	31	I didn't understand what this section is referring to. Long term = GIA but here it discusses groundwater/hydrocarbon withdrawl which is short term? There appears to be nothing on GIA at all here despite the fact that the rates for parts of N America are > 1cm/yr and the viscoelastic response of parts of WAIS larger still (Barletta...) [Jonathan Bamber, United Kingdom (of Great Britain and Northern Ireland)]	we changed the title to vertical land motion
2509	4	45	33	0	49	I would say this demonstrates significant improvement. Good [John Church, Australia]	thanks no changes needed
19979	4	45	34	45	44	Where are the references? [APECS Group Review, Germany]	several recent semi-empirical studies are referenced at the end of the paragraph
30039	4	45	34	45	49	The approach by Mengel et al. is cited incorrectly here: it distinguishes between the different sea-level components, including Antarctica. In addition, in its update in Mengel et al. (2018) it has a significant contribution from the Antarctic Ice Sheet and includes the processes mentioned (hydrofracturing, MICI) from DeConto and Pollard (2016). [Ronja Reese, Germany]	corrected the second reference to Mengel has been moved to the next sentence where it belongs

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27463	4	45	45	45	47	The description of semi-empiricals does not fit the models of Mengel et al. 2016, Mengel et al. 2018 and Nauels et al. 2017. Semi-empirical models that only use past time series to predict future rise are to my knowledge Rahmstorf 2007, Vermeer and Rahmstorf 2009, Grinsted et al 2009, Kemp et al. 2009, Kopp et al 2016. They are correctly listed, for example, in Kopp et al. 2016 referenced in this paragraph. The model of Mengel et al. constrains the sensitivity to future warming by long-term equilibrium estimates for each sea level contribution, which classic semi-empirical models do not do. It is thus capable of incorporating increased future sensitivity of, for example, Antarctic ice loss. (The original 2016 publication did not include such because it was not the state of knowledge then.) Similarly, the model of Nauels et al. does not fit the category of semi-empiricals as it does not aim at deriving future response from past change. It rather aims to emulate the response to global warming of more complex models of the different sea level contributors. I suggest that this paragraph be split, correcting the citations for semi-empiricals and then adding a new part “Contribution-based approaches and sea level emulators”. This paragraph would be suited for the models of the Mengel et al, Nauels et al, Bakker et al. and Wong et al. The current text misses a crucial point of all these group of models: they can estimate sea level rise for scenarios other than the standard RCPs from global mean temperature or emission pathways. [Matthias Mengel, Germany]	We now separated the semi-empircal estimates in two parts as suggested by the reviewer.
16353	4	45	46	45	49	Unfortunately, this assessment citing Nauels et al 2017a is wrong, as Nauels et al 2017a does not represent a semi-empirical approach (observed relationships between temp/forcing and GMSLR inform future projections) but a probabilistic emulator of process-based simulations per SLR component (hist+projections). Therefore, there simply shouldn't be a significant difference between Nauels et al 2017a projections and process-based results, be it in the CMIP5/AR5 consistent setup (Church et al 2013) or including the DeConto&Pollard2016 update (Nauels et al 2017b). Hence, this sentence is obsolete. Please delete. [Alexander Nauels, Germany]	we rephrased the section in line with the previous comment
4751	4	45	51	0		Section: is 'bottom-up' in Table 4.4 heading the same as 'probabilistic and semi-empirical' in Section heading? Please explain usage of these terms, and use consistently. [Debra Roberts and Durban Team, South Africa]	we removed the terminology of bottom-up

Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17253	4	45	51	47	7	The discussion in Section 4.2.3.3.4 bears remarkable similarity to discussions in other recent publications, which are not cited here (but should be). In particular, the discussion in general has some overlap with Section 5 of Garner et al., 2018 (Full Citation given below). Additionally, there are similarities in the discussion in Section 4.2.3.3.4 to some of the discussion in Horton et al., (2018). I note that the authors have included Horton et al. (In Press) in the list of references, which should be updated in the reference list to reflect the fact that the paper has now been published, and should be cited within Section 4.2.3.3.4 as well as elsewhere. In summary, citations need to be added to Section 4.2.3.3.4 for: Garner, A. J., Weiss, J. L., Parris, A., Kopp, R. E., Horton, R. M., Overpeck, J. T., & Horton, B. P. (2018). Evolution of 21st century sea level rise projections. Earth's Future, 6. https://doi.org/10.1029/2018EF000991 And Horton, B.P., Kopp, R.E., Garner, A.J., Hay, C.C., Khan, N.S., Roy, K., & Shaw, T.A. (2018). Mapping Sea-Level Change in Time, Space, and Probability. Annual Review of Environment and Resources 43:481-521. https://doi.org/10.1146/annurev-environ-102017-025826. [Andra Garner, United States of America]	the paper by Garner et al. 2018 was not yet available at the time of writing the SOD and is relevant for this section and hence cited here now. We also included the Horton et al. paper.
6341	4	45	54	0		Is it possible to rephrase "Many … simulations"? Meaning not clear. [Nina Hunter, South Africa]	clarified
15673	4	45	56	45	57	It is somewhat puzzling to argue that semi-empirical projections are good to elucidate on senstivities and bounds when with the exception of Wang et al. 2017, none of the semi-empirical studies quoted exceed the upper bound of GMSL for 2100 under RCP8.5 in Table 4.3 - this makes no sense. [EUCE, Belgium]	text has been rephrased to be more consistent with the results presented in the Table
13961	4	46	0	47		Table 4.4. Regarding Slangen et al (2014b), my understanding was that the authors estimated their own fingerprint patterns. So I was surprised to see Mitrovica et al (2001) cited. Perhaps the authors could double-check this? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	corrected
13963	4	46	0	47		Table 4.4. The basis of the GIA estimates should be included throughout with the appropriate reference(s). [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Unclear what the reviewer means there is a column for the GIA and references therein

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27033	4	46	8	0		Since all of them use CMIP5 for ocean dynamic sea level change, you could remove that column and note it in the caption instead. As usual, I would recommend not using "fingerprint". The term of Gregory et al. (terminology paper) is "GRD" for these effects. [Jonathan Gregory, United Kingdom (of Great Britain and Northern Ireland)]	we changed the terminology, but prefer to have all components in a column even if they are similar for the different studies
26153	4	46	8	46	8	Line Lebarse et al: reference Radic and Hock, 2010 does not have a glacier model. Do you mean Radic and Hock 2011 or Radic et al.,2014? [Regine Hock, United States of America]	corrected
27465	4	47	0	0		Table 4.5: In Table 4.5, the models of Bakker, Wong, Nauels as well as Mengel should not be listed under semi-empirical. The first three are simply not such models, the Mengel model would at least need a rewrite of the definition of semi-empirical. [Matthias Mengel, Germany]	header of the table is changed in line with textual changes
27469	4	47	0	0		Table 4.5: The numbers of Mengel et al. are not the same as in the reference. How were they calculated? Why are no ranges given? [Matthias Mengel, Germany]	The numbers have been corrected
22515	4	47	0	47		Suggest reviewing the values in Table 4.5 from Jackson and Jevrejeva 2016. Should they be: 0.54 (0.36-0.72) under RCP4.5, and 0.75 (0.54-0.98) under RCP8.5, not 0.52 (0.34-0.69) and 0.72 (0.52-0.94)? [Government of Australia, Australia]	corrected
17255	4	47	1	47	8	Table 4.5 is not quite identical, but is extremely similar to Garner et al., 2018's Table S4. Please add a citation to Section 4.2.3.3.4 for: Garner, A. J., Weiss, J. L., Parris, A., Kopp, R. E., Horton, R. M., Overpeck, J. T., & Horton, B. P. (2018). Evolution of 21st century sea level rise projections. Earth's Future, 6. https://doi.org/10.1029/2018EF000991 [Andra Garner, United States of America]	we don't have that Table as it is not downloabdable from the AGU website
4753	4	47	3	0		Table 4.5 please remind the reader what interval 'likely' refers to. [Debra Roberts and Durban Team, South Africa]	added
16355	4	47	3	47	3	Information provided in Tables 4.4 and 4.5 should be cosistently sorted alphabetically/by year. [Alexander Nauels, Germany]	Values in the Table have been corrected
16357	4	47	3	47	3	Reference period(s) are missing and have to be provided! [Alexander Nauels, Germany]	corrected

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
16359	4	47	3	47	3	As explained before, the Nauels et al 2017a/b methodology is not semi-empirical and the estimates should therefore move to the category above. Also, and this is far more important, the corresponding estimates for 2100 are wrongly cited and nowhere to be found in the original publications (assuming Table 4.5 uses AR5 reference period 1986-2005). In Table 7 of Nauels et al 2017a (GMD model description paper with AR5 consistent setup) 2100 estimates are 0.45 [0.35 to 0.56] m for RCP2.6, 0.55 [0.45 to 0.67] m for RCP4.5, and 0.79 [0.65 to 0.97] m for RCP8.5. 2050 values have not been provided explicitely in the paper, but can be provided here: 0.24 [0.19 to 0.30] m under RCP2.6, 0.25 [0.21 to 0.30] m under RCP4.5 and 0.27 [0.23 to 0.33] m under RCP8.5. Please get in touch if there are any further questions. The confusion about the estimates provided in the table gets even bigger: In Nauels et al 2017b, the analysis is focussing on SSPs. There is no specific SSP RCP marker pathways analysis provided for directly comparing to AR5 style RCPs (because the SSP RCP analogues hadn't existed back then), but an average over all the excisting RF forcing target realisations. Baseline SSP pathways cannot be used as RCP8.5 equivalent, only SSP5 baselines come close. In Table 4.5, it is therefore not feasible to simply show RCP estimates based on the SSP Forcing Target (FT) analysis conducted in Nauels et al 2017b (and again, the current Table 4.5 entries cannot be found in the paper which is extremely worrying regarding all other values presented in this table). Table 4.5 has to be thoroughly checked, corrected and revised! If the author team still decides to include the Nauels et al 2017b results, the labels and estimates have to be extracted from Table 1 in Nauels et al 2017b (or Supplementary Table S2 for Church et al 2013 consistent setup), with corresponding changes to Table 4.5. Further clarification can be provided if needed. [Alexander Nauels, Germany]	Values in the Table have been corrected
4113	4	47	3	47	6	Are the probability in parentheses in the table all 'likely'? Please have a check. In particular, coastal risk management and decision making needs information of extreme scenarios of sea level rise, i.e., small probability scenarios. [Jiahong Wen, China]	Values in the Table have been corrected
19981	4	47	3	47	6	The reference periond of the anomaly is missing at the table caption. [APECS Group Review, Germany]	corrected accordingly
32337	4	47	3	47	6	Again, the caption should provide the base year or range of years from which projections are made. [Donald Boesch, United States of America]	corrected accordingly
2181	4	47	3	47	7	Is this compilation based on the TSU's work or the published analyses of Horton et al 2018 and Garner et al 2018? If the latter, (1) the source should be cited, and (2) it should be noted that the numbers are standardized to attempt to approximate a common baseline period centered on the year 2000. [Robert Kopp, United States of America]	original values are used with different baselines as mentioned

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33497	4	47	4	47	7	The last two entries under semi-empirical models are formatted differently than the model results immediately above them. [Government of United States of America, United States of America]	corrected accordingly
27467	4	47	6	0		For the Bakker, Wong, Nauels as well as Mengel models, it is wrong that they are not built up from different components. They are misinterpreted here. Their results should be separated from classic semi-empiricals like these of Schaeffer et al. and Jevrejeva et al. 2012. [Matthias Mengel, Germany]	Maya
4755	4	47	9	0		Section 4.2.3.4 This section is one of the most important for policy especially in urban context, and the implications should be easily accessible. The log-linear relationship between flood height and occurrence interval is extremely important. The information should be accessible to local and regional policy makers, and the section is too technical for that. [Debra Roberts and Durban Team, South Africa]	A simpler form is condensed for the SPM
33499	4	48	1	48	3	Wave runup was previously included in this type of list in this document but is not included here. Be consistent on the description and defintions for ESL, RSL, and SLR. [Government of United States of America, United States of America]	we left out waves as this is usually not captured in the tide gauge record used to arrive at ESL. The return height versus frequency curves are driven by tides, storm surges and changes in the mean over time
11113	4	48	1	48	55	The whole page is supposed to introduce the Extreme Sea Level phenomena and the way they are/can be modeled for future predictions, and their relation to the Sea Level Change. In my opinion this section is very dense, and contrarily to the previous ones, sometimes a bit too detailed, is too technical, and difficult to follow. [Valentina R. Barletta, Denmark]	It is true that it is dense and not very long, but rather than expanding the section we reduced previous section in length given the page constraints for the report.
15613	4	48	1	48	55	The whole page is supposed to introduce the Extreme Sea Level phenomena and the way they are/can be modeled for future predictions, and their relation to the Sea Level Change. In my opinion this section is very dense, and contrarily to the previous ones, sometimes a bit too detailed, is too technical, and difficult to follow. [EUCE, Belgium]	see previous comment
6343	4	48	5	0		Change "possibly" to "possible" [Nina Hunter, South Africa]	changed accordingly
4735	4	48	7	48	16	This is one of the most policy relevant paragraphs in the chapter (together with p54:8-15), but it contains too little detail. Is this a product of the literature? Ideally rising sea levels, rising risk of extreme sea level events and the flooding that goes with it needs to be unpacked in terms of actual numbers of people affected, urban vs rural, where these people live, by region or even country, graphs, maps, etc: these are highly relevant details. [Debra Roberts and Durban Team, South Africa]	4.2.3.4 provides an overview of the processes involved. 4.2.3.4.1 provides a way to calculate the projected changes in extreme sea level in projections. We clarifed this

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31191	4	48	7	48	16	Here projections are mixed with risk analysis. Suggest to avoid this, to be consistent with the overall chapter structure and narrative. [Hans-Otto Poertner and WGII TSU, Germany]	we minimized the risk information in this paragraph
33501	4	48	8	48	9	How do we know this relationship will still hold under future climate changes? This statement probably needs a reference because it sounds like an assumption that may need more explanation. For example, what happens if climate change pushes us into more of a bimodal distribution in a local area? Perhaps this only works globally. If so, make sure that this is clear. [Government of United States of America, United States of America]	Unclear what the reviewer means, probably the reviewer means whether the log-linear relation is constant over time. This is often not known with enough detail and here it is only meant to indicate that these two quantities are related in a log linear way. If the question is why there is log-linear relation at all the easiest answer is that the relation follows from plotting the return height of a tide gauge station and the frequency that this height occurs.
16361	4	48	12	48	17	These multiple lines of evidence should result in a quantiative ES statement. In our opinion, the ES very much needs quantitative information on anticipated ESL impacts. [Alexander Nauels, Germany]	We agree and therefore there is an executive statement on ESL which also carries over to the SPM
2441	4	48	14	48	16	The orginal source for this is Hinkel et al. (2014) [Thomas Wahl, United States of America]	changed accordingly
3023	4	48	18	48	18	"The frequencies of ESL events can be estimated with hydrodynamic or statistical models": suggest rephrasing: "The frequency and intensity of ESL events can be estimated with statistical models applied to observations or hydrodynamic reconstructions" or something similar. [Goneri Le Cozannet, France]	changed accordingly
10833	4	48	20	48	20	I think return level would be a better word to use within the bracets [Magnus Hieronymus, Sweden]	changed accordingly
15675	4	48	20	48	20	Why are return periods of 1 in 100 year being used for "extreme" events? Why aren't return periods of 1 in 500 and 1 in 1000 year events considered in this analysis? [EUCE, Belgium]	all can be used 1/100 is just one used often we rephrased the sentence to express it is just an example
2443	4	48	20	48	23	This is not clear, most hydrodynamic models simulate both tide and surge, especially when applied at the local/regional scale. Global surge models like GTSM were previously coupled with "offline" tide models. Also it sounds here as if the statistical models used to analyze outputs from hydrodynamic models and from tide gauge observations were different, but they are not, just the underlying data comes from different sources. [Thomas Wahl, United States of America]	The role of tides has been explained better in the text
3025	4	48	21	48	22	"Statistical models fit tide gauge observations to extreme value distributions to directly estimate storm tide distributions or combine probabilistic sea-level rise scenarios with storm surge modelling": I have difficulties to understand this sentence. I think this is due to the terminology. Is this really "storm tide distributions" or "extreme water levels" (?). Do the authors want to mention sea-level scenarios or (probabilistic) projections? [Goneri Le Cozannet, France]	ambiguity removed
3645	4	48	23	48	23	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	changed accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6345	4	48	24	0		Suggest changing "estimating" to "estimate" [Nina Hunter, South Africa]	changed accordingly
6347	4	48	25	0		Remove bracket after "coast" [Nina Hunter, South Africa]	changed accordingly
2445	4	48	30	48	31	A good example for this are the papers by Arns et al. (2014) (https://doi.org/10.1016/j.coastaleng.2014.12.002) for SLR, tide and surge and Arns et al. (2017) (already in the reference list) for SLR, tide, surge, wave runup [Thomas Wahl, United States of America]	added
3027	4	48	30	48	38	An other difficulty with hydrodynamic models forced with climate models is that they inherit the limitations (resolution, precision, accuracy) of wind and pressure in climate projections. As for waves, a good reference here could be a paper from the COWCLIP community (Morim et al 2019?). [Goneri Le Cozannet, France]	we took on board the remark on waves
6349	4	48	33	0		Suggest "these" instead of "those" X 2 [Nina Hunter, South Africa]	changed accordingly
6351	4	48	37	0		Suggest changing sentence to: "The areas where ESL is dominated by tropical storms are problematic" [Nina Hunter, South Africa]	changed accordingly
19983	4	48	38	48	38	Sentence not clear: “Models exist, which perform well for present-day conditions (Stammer et al., 2014).” [APECS Group Review, Germany]	sentence removed
3647	4	48	51	48	51	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	changed accordingly
21819	4	49	1	49	27	Similar findings were also found when investigating signals and triggers for when a given adaptation threshold, expressed as number of ESL events, will occur per decade, for different tidal/ESL regimes. Addresses the situations where the RSL swamps the ESL return-period distribution (with high AF100 factors even for RCP2.6) and highlights the imminent emergence of adaptation thresholds in the next few decades. Ref: Stephens, S.A.; Bell, R.G.; Lawrence, J. (2018). Developing signals to trigger adaptation to sea-level rise. Environmental Research Letters 13(10): 104004, 11 p. https://doi.org/10.1088/1748-9326/aadf96 [Robert Bell, New Zealand]	incorporated this reference
3651	4	49	1	49	34	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	changed accordingly
4759	4	49	6	0		How good are the models? This text is not easy to understand. This assumption in the models (that variability does not change over time) seems to be contradicted by the observations in Figure 4.9: in several localities the observed rarest extreme events heights are well above the predicted heights. If these are going to become much more frequent, then this has potentially huge implications. The text seems to say so? But perhaps this could be said more simply / clearly. Break up this long paragraph into several shorter ones to make the information more accessible. [Debra Roberts and Durban Team, South Africa]	we tried to improve the paragraph accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2449	4	49	6	49	9	It's worth mentioning that the raw hourly time series was detrended and also how it was detrended (since it can have an affect on the extremes statistics). Or was the 99.7th threshold caclulated for each year seperately and the sea level rise trend eliminated this way? [Thomas Wahl, United States of America]	more specifics on the data treatment are added
22783	4	49	8	49	9	The authors use a Peak-Over-Threshold approach combined with a GPD extreme law to analyse extremes. My concern is related to the choice of the GPD threshold. The authors base their choice on the study by Arns et al. (2013), who showed that the value of 99.7th percentile yielded stable results. The problem is that this choice is site specific and is only valid for the tide gauges that Arns et al. (2013) studied; namely for the German Bight. Given the large number of studies showing the high sensitivity of GPD-based extreme value analysis to this choice (see e.g. in the Climate science community: Wahl et al. 2017 and in the statistical domain: Bader et al., 2018; Northrop et al., 2017 and references therein), using this threshold globally should be accompanied of a word of cautious about the related uncertainty; preferably (and if possible), the studies in Fig. 4.9 should be completed with some stability analysis (like the ones carried out by Arns et al., 2013) to support the choice in the threshold value. References Bader, B., Yan, J., & Zhang, X. (2018). Automated threshold selection for extreme value analysis via ordered goodness-of-fit tests with adjustment for false discovery rate. The Annals of Applied Statistics, 12(1), 310-329. Northrop, P. J., Attalides, N., & Jonathan, P. (2017). Cross-validatory extreme value threshold selection and uncertainty with application to ocean storm severity. Journal of the Royal Statistical Society: Series C (Applied Statistics), 66(1), 93-120. Wahl, T., Haigh, I. D., Nicholls, R. J., Arns, A., Dangendorf, S., Hinkel, J., & Slangen, A. B. (2017). Understanding extreme sea levels for broad-scale coastal impact and adaptation analysis. Nature communications, 8, 16075. [Jeremy Rohmer, Finland]	We use the preferred value by Wahl et al. 2017 and provided some caution notion
4757	4	49	10	0		What does "perturbed" mean? Sudden steps in the Monte Carlo simulations? [Debra Roberts and Durban Team, South Africa]	needles complication removed perturbed
11115	4	49	11	0		Are the results of all this section based on Frederikse et al. in review? How should we suppose to evaluate this section? [Valentina R. Barletta, Denmark]	the method is explained in the supplementary information which is not part of the SOD but part of the final version, it follows essentially Arns et al. (2013) as explained in the text
15615	4	49	11	0		It is uclear wether the results of all this section are based or not on the poaper Frederikse et al. in review. [EUCE, Belgium]	see previous comment
3649	4	49	17	49	17	sea level rise --> SLR [Nam SungHyun, Republic of Korea]	changed accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2447	4	49	18	49	24	The text repeatedly refers to results for Kerguelen Island, but it's not in the figure. I also do not understand the statement in line 19 about return heights. The sentence in lines 23 and 24 doesn't make any sense to me either. [Thomas Wahl, United States of America]	Kerguelen has been replaced by another location in Figure 4.9 and the text has been adjusted accordingly
16363	4	49	33	49	33	Please add the footnote for PDRP! [Alexander Nauels, Germany]	term is removed
6353	4	49	35	0		Suggest placing "It is…Chapter 1" in parentheses [Nina Hunter, South Africa]	removed
4761	4	50	0	0		Figure 4.9: - make the "All100" line another colour, not black, to differentiate it from the black present-day line. - The caption could be more helpful. Say that the vertical difference between the present-day and a particular future scenario (vertical arrow in example) shows the difference in water height for extreme events of a particular return frequency, whereas the horizontal difference (purple arrow in example) shows increased return frequency of a particular height. - For the Example panel, give a proper illustrative narrative: e.g. "Events that are currently 2.2 m high (put the purple line exactly on 2.2 for clarity), and currently occur every 100 years, will in future (2100?) occur every 3 years, based on the ___scenario". Use one of the actual scenario colours (eg orange), it is confusing having a green line when there is no green line in the data panels. - because this is a log-scale, the x-axis grid lines should be a little darker and more visible, and the numbers 2, 3, 4 and 5, and say 20, 30 and 40 should be labelled. What does it mean if the horizontal difference between present day never meets up with a future scenario? e.g. Zanzibar: the 1-in-100 yr event lies at >2.5m, but the future scenarios start at >2.75m. How do you read this? What do x-values below 1 mean? That an even occurs several times a year? [Debra Roberts and Durban Team, South Africa]	The lay-out of the figure is improved and the caption of the figure is improved
15079	4	50	0	51	3	Figure 4.9, graphic "example" in the upper right: The example graphic in the first order draft illustrated more options to "read" figure 4.9, perhaps it is possible to use this first order graphic [Government of Germany, Germany]	There was a request to simplify which we followed
15081	4	50	0	51	3	Figure 4.9, 12 exemplary tide gauge stations: The new version of this Figure shows changes for some stations (e.g. Cuxhaven) in "AF100". At other stations (e.g. New York) the range of observations is changed, too. Why does the new version differ so much from the first order draft version (not only in layout, but also in content)? If recent progress/new literature has led to these changes, please consider to highlight it in the accompanying text (as progress since AR5). [Government of Germany, Germany]	RSL is not the same and the extreme value statistics is slightly different

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2453	4	50	1	50	1	For some locations such as Papetee or Guam the shape paramater switches in sign, I am wondering how that is possible if future changes in storminess are not accounted for. [Thomas Wahl, United States of America]	calculations have been redone
19985	4	50	1	50	1	Maybe include name country after city name. [APECS Group Review, Germany]	the upper left fiugre shows the locations
22785	4	50	1	50	1	Fig. 4.9: What is the meaning of the grey-colored uncertainty band? Is it associated to a 95% confidence interval? There is no indication, neither in the caption nor in the legend. Furthremore, an indication of the technique used may be here welcomed; for instance the delta-based apporach tends to underestimate the uncertainty compared to bootstrap-based or Bayesian techniques. [Jeremy Rohmer, Finland]	The caption has been adjusted to explain this
29009	4	50	1	50	8	We do not understand the trend and crosses in the 12 panels (observed extremes). These extremes should come from long time series (50 years or more?). But then the trend should have been removed to get a probability distribution for the "present day".Could you clarify what message(s) come from this figure?. [Government of Netherlands, Netherlands]	The figure should not be interpreted as a trend. The black crosses indeed come from long time series and show the retun height as a function of the return period for say the last hundred years. This estimates comes with an uncertainty being the grey band. The message from the figure is for instance that events which take place once in a hundrerd years in shanghai which reach a level of 4.4 m are expected to take place once every 2 years under RCP8.5 at the end of the century and every 20 years if RCP2.6 is followed. Hence for RCP8.5 the amplication factor is 50 for this location. This implies that adaptation is needed everywhere. Comparing the different panels shows in addition that areas where the curves are flat e.g. Guam will experience a tremendous increase in the amplification factor. In that region event which are now taking place every hundrerd years will take place several times a year even for RCP2.6
6355	4	50	4	0		Change "condition" to "conditions" [Nina Hunter, South Africa]	changed accordingly
11117	4	50	8	0		The caption is truncated. [Valentina R. Barletta, Denmark]	unclear which caption is meant
15617	4	50	8	0		The caption is truncated. [EUCE, Belgium]	unclear which caption is meant
12009	4	51	1	0		Figure 4.10 could benefit from the open dataset of ESL projections of Vousdoukas et al 2018 (Nature Communications). Note that figure 8 of the same paper provides similar information [Michail Vousdoukas, Italy]	we added this reference
6357	4	51	3	0		"currtenly" spell "currently" [Nina Hunter, South Africa]	changed accordingly
10835	4	51	3	51	3	It is not clear from the caption how those observed extremes are calculated, i.e. what time periods are used. [Magnus Hieronymus, Sweden]	the caption has been expanded
23723	4	51	3	51	3	It is not clear from the caption how the observed extremes are calculated, such as the time periods used. Please clarify as appropriate. [Government of Sweden, Sweden]	see previous comment
4241	4	51	5	51	6	It would be better to put 0º-meridian in the center of the maps because 0º-meridian is a densely populated area (high exposure). On the contrary, few people live around (low exposure) the 180º-meridian area. [Josep Ramon MEDINA, Spain]	there is no agreement in the community how to do this

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15083	4	51	5	51	6	Please consider adding parameter to color bar [Government of Germany, Germany]	we added the quantity to the color bar
29005	4	51	5	51	11	Please explain the relation with Figure 4.9. Source of graph? [Government of Netherlands, Netherlands]	the link to figure 4.9 has been improved in the caption. It is in fact the same data, the quantity plotted is explained in figure 4.9
4763	4	51	8	0		Figure 4.10 explain what a value of 60 for instance means in real life, as in, what do you do with that number? Does it mean a 1-in-100yr events will happen every 60 years in future? When? By 2100? - This Figure is potentially useful to policy makers, as they can read off a value for their location, as long as they know what to do with the number. It is not ideal that in some areas dots lie on top of and hide each other. Is it possible to do something about that? Explode those areas? Average them? Represent the coastline as a multi-coloured line instead of dots as has been done in other figures later in the chapter? It would help if there was one single full-page spread of the most relevant scenario (let's say the scenario that is closest to the world's current observed trend, projected for 2046-2065). Then policy makers could see in more detail, for their locality, what sort of coastal conditions we are heading to in the near future if we keep going the way we are going. A message like that could be really powerful. Alternative scenarios and time frames could be included in supplementary material. [Debra Roberts and Durban Team, South Africa]	We improved the caption. All individual sites are listed in the supplementary information. Averaging the location is not a good idea because the regional variability is large and as consequence the averaged values are misleading.
2455	4	51	14	51	21	Either here or further up (p. 27) I think it is important to mention that tropical cyclone induced storm surges are significantly under-represented in the extreme samples when derived from obervations or model hindcasts. This has a big effect on the distributions shown here and has been identified as a major issue in assessing present-day (and future) flood risk. Two papers by Haigh et al. adressed this for the coastline of Australia (DOI 10.1007/s00382-012-1652-1; DOI 10.1007/s00382-012-1653-0) [Thomas Wahl, United States of America]	we have added this caveat
16365	4	51	14	51	21	The corresponding ES statement uses the much more vague qualfiers rare -> common. This should be changed based on the assessment and Figure 4.10 to the explicit and much more tangible "100yr RP can become annual RP for most of the coasts around the globe in the absence of climate mitigation efforts". [Alexander Nauels, Germany]	we rephrase the ES statement and this information will get across to the SPM as well to draw attention to this

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4765	4	51	23	0		The section on waves obviously goes hand in hand with the previous section. Again, this has huge implications for policy makers, and should be highly accessible. Perhaps a second global map could be created, to go with Figure 4.10, that shows how on top of the mean sea level, there is an additional wave height of x to consider. If one could read off mean sea level from Figure 4.10 and extra wave height from an additional figure, and add the two numbers together to get total impact, that would be brilliant. [Debra Roberts and Durban Team, South Africa]	Rejected. Although we agree with the comment, there is no space for an extra figure. The study by Vousdoukas et al. (2018) has been cited in the section, and includes wave contribution to extreme sea levels at global scale, in addition to contributors to regional sea level changes.
17535	4	51	24	52	14	Reduced Arctic sea ice allows greater swell of waves in the Arctic Ocean, which can further disrupt sea ice and accelerate breaking up of ice, becoming a positive feedback loop; see Thomson J. & Rogers W. E. (2014) Swell and sea in the emerging Arctic Ocean, GEOPHYSICAL RESEARCH LETTERS 41:3136–3140; see Day J. J. & Hodges K. I. (2018) Growing Land-Sea Temperature Contrast and the Intensification of Arctic Cyclones, GEOPHYSICAL RESEARCH LETTERS 45:3673–3681. [Kristin Campbell, United States of America]	Accepted.A sentence has been added. The Thomson and Rogers (2014) and Day and Hodges (2018) references have been added.
17645	4	51	24	52	22	The loss of remaining Arctic sea ice is not necessarily going to be a linear process; younger sea ice, which makes up most of the Arctic sea ice now, is more susceptible to break up. Perovich D., et al. (2018) Sea Ice, in ARCTIC REPORT CARD 2018, 28 ("Older ice tends to be thicker and is thus more resilient to changes in atmospheric and oceanic heat content compared to younger, thinner ice. The oldest ice (>4 years old) continues to make up a small fraction of the Arctic ice pack in March, when the sea ice extent has been at its maximum in most years of the satellite record. In 1985, the oldest ice comprised 16% of the ice pack (Fig. 3a), whereas in March of 2018 old ice only constituted 0.9% of the ice pack (Fig. 3b). Therefore, the oldest ice extent declined from 2.54 million km2 in March 1985 to 0.13 million km2 in March 2018, representing a 95% reduction."). [Durwood Zaelke, United States of America]	Accepted.A sentence has been added.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17647	4	51	24	52	22	Reduced Arctic sea ice allows greater swell of waves in the Arctic Ocean, which can further disrupt sea ice and accelerate breaking up of ice, becoming a positive feedback loop; see Thomson J. & Rogers W. E. (2014) Swell and sea in the emerging Arctic Ocean, GEOPHYSICAL RESEARCH LETTERS 41:3136–3140, 3136 (“Ocean surface waves (sea and swell) are generated by winds blowing over a distance (fetch) for a duration of time. In the Arctic Ocean, fetch varies seasonally from essentially zero in winter to hundreds of kilometers in recent summers. Using in situ observations of waves in the central Beaufort Sea, combined with a numerical wave model and satellite sea ice observations, we show that wave energy scales with fetch throughout the seasonal ice cycle. Furthermore, we show that the increased open water of 2012 allowed waves to develop beyond pure wind seas and evolve into swells. The swells remain tied to the available fetch, however, because fetch is a proxy for the basin size in which the wave evolution occurs. Thus, both sea and swell depend on the open water fetch in the Arctic, because the swell is regionally driven. This suggests that further reductions in seasonal ice cover in the future will result in larger waves, which in turn provide a mechanism to break up sea ice and accelerate ice retreat.”). At the same time, reduced sea ice provides favorable conditions for cyclone development and increased intensity of cyclones, which can also facilitate break-up of sea ice; see Day J. J. & Hodges K. I. (2018) Growing Land-Sea Temperature Contrast and the Intensification of Arctic Cyclones, GEOPHYSICAL RESEARCH LETTERS 45:3673–3681, 3680 (“Further, because climate change is increasing land-sea contrasts in the Arctic, it seems highly likely that the circulation patterns typical of years with strong AFZ will become more common as the climate warms. Indeed, strengthening of the mean temperature gradients in the AFZ is a robust feature of future climate projections as is an increase in the strength of the Arctic Front Jet (Mann et al., 2017; Nishii et al., 2014). This study shows that this linkage between surface temperature gradients and atmospheric circulation is important for Arctic cyclones, adding weight to previous studies.”). [Durwood Zaelke, United States of America]	Accepted.A sentence has been added. The Thomson and Rogers (2014) and Day and Hodges (2018) references have been added.
10347	4	51	24	52	45	What are the specific implications for small islands from this? [Mahmood Riyaz, Maldives]	Accepted. A sentence has been added. "Regional projections of wind-waves have mostly been applied to Europe so far, while highly vulnerable regions have been largely overlooked. This is the case for low-lying islands where impacts of seal-level rise and wave-induced flooding are likely to be severe and adaptive capacity is reduced (e.g. Albert et al. 2016; Hoeke et al. 2013)." The section also discuss global studies.
12011	4	52	4	0		Such changes are similar to the ones reported by Mentaschi et al (https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL072488) [Michail Vousdoukas, Italy]	Noted.
10221	4	52	5	52	10	Please also mention the projection of annual and seasonal mean significant wave height changes for western North Pacific. [SAI MING LEE, China]	Accepted.The sentence has been modified to include the northwestern Pacific.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
12013	4	52	14	0		See also figure 3 of Mentaschi et al (https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016GL072488) discussing projected changes in wave direction [Michail Vousdoukas, Italy]	Noted. A review of projected wave characteristics changes (based on 91 published wind-wave climate projection studies) is cited instead of specific studies.
4243	4	52	20	52	21	Isobe (2013) analyzed in detail the impact of global warming on a variety of costal structures, much more than simple depth-limited conditions. [Josep Ramon MEDINA, Spain]	Accepted. The reference has been added to the text.
4245	4	52	20	52	21	Isobe, M. (2013): Impact of global warning and adaptation strategy in the coastal zone. Proc. of Coastal Structures 2011, World Scientific, Vol 1, 3-19. [Josep Ramon MEDINA, Spain]	Accepted. The reference has been added to the text.
6359	4	52	27	0		Remove "an" [Nina Hunter, South Africa]	Corrected.
24083	4	52	29	52	29	Vousdoukas did not use a wave model but a storm surge model (without waves) [Sylvain Ouillon, France]	Corrected.The authors use a storm surge model and a parameterization for wave setup. The sentence has been modified.
4767	4	52	31	0		"5m Europeans": are there values for other regions? [Debra Roberts and Durban Team, South Africa]	Partly accepted. The corresponding sentence has been modified to discuss changes in ESL at global scale, but figures on impacted population have been removed. "Global-scale projections of extreme sea level changes including wave setup indicate a a very likely increase of the global average 100-year ESL of 58-172 cm under RCP8.5 (Vousdoukas et al. 2018). Changes in storm surges and waves enhance the effects of relative sea level rise along the majority of northern European coasts, with contributions up to 40% in the North Sea (Vousdoukas et al. 2017). "
6361	4	52	31	0		Change "100-year" to "100-years" [Nina Hunter, South Africa]	Rejected. The corresponding sentence has been modified.
12015	4	52	31	0		See also similar results globally from Vousdoukas et al 2018 (Nature Communications) [Michail Vousdoukas, Italy]	Accepted. to discuss changes in ESL at global scale, and the reference to Vousdoukas et al. (2018) added.
9169	4	52	36	52	36	The reference Melet et al. (in review) should be replaced by Melet et al. (2018), which is already in the list of references. [Angelique Melet, France]	Corrected.
3545	4	52	36	52	41	The reference to Melet et al (in review) : I'm not sure if this should be updated to Melet et al 2018 (the Nature Climate Change article given in the reference list). [Sonya Legg, United States of America]	Corrected.
4769	4	52	40	0		What is "sterodynamic"? [Debra Roberts and Durban Team, South Africa]	Rejected. The corresponding sentence has been deleted.
6363	4	52	52	0		Change "increases" to "increase" [Nina Hunter, South Africa]	Accepted.
4771	4	53	4	53	7	"an increase in global TC frequency..in most locations" ... "most models still project a decrease or constant global frequency of TCs" seems to be a contradiction? "Additionally, it is noting that a robust increase in ratio of intense TCs at the same time." needs to be reworded. [Debra Roberts and Durban Team, South Africa]	Accepted. In order to avoid misunderstanding, the sentence has been reworded and moved to the end of paragraph.
2183	4	53	6	53	7	But see Bhatia et al 2018 (doi:10.1175/JCLI-D-17-0898.1), showing global increases in frequency as well as intensity in a global cyclone-resolving GCM [Robert Kopp, United States of America]	Yes, Bhatia et al., (2018) indicated the similar result to Emanuel 2013a. We added this literature.
6365	4	53	7	0		Difficult to understand sentence. Please make clear. [Nina Hunter, South Africa]	We reworded the sentence.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10223	4	53	11	53	11	The statement "an increase in frequency" is not consistent with what has depicted in previous paragraph that most models still project a decrease or constant global frequency of TCs. Is it referring to "intensity" ? Please clarify. [SAI MING LEE, China]	We reworded the sentence.
4773	4	53	14	0		"favourable" - for cyclone formation? [Debra Roberts and Durban Team, South Africa]	Yes, not only for cyclone formation, but also for the increase in the lifetimes, intensity and poleward shift sth like that. Hence, we here use the “these projected increase”.
10225	4	53	15	53	15	For consistency, please replace "northwest Pacific" by "western North Pacific" to align with the rest of the text. [SAI MING LEE, China]	Accepted. We changed that.
4775	4	53	23	0		"reduce the projected intensification" - what exactly is meant? [Debra Roberts and Durban Team, South Africa]	It means that the effect of increased stratification will reduce the projected intensification of TCs by 10%-15%. We removed this sentence due to the page space limitation.
4777	4	53	24	0		"The effect is estimated to be not more than about 15%" - the effect of what on what? Estimated how? In models? The text here is not very clear. [Debra Roberts and Durban Team, South Africa]	It means that the effect of increased stratification will reduce the projected intensification of TCs by 10%-15%. We removed the sentence due to limited page space.
19987	4	53	27	53	28	Short explanation of semi-empirical genesis indices and why are these problematic? [APECS Group Review, Germany]	We removed this sentence and reorganized the context.
6367	4	53	28	0		Suggest change "number" to "numbers" [Nina Hunter, South Africa]	Accepted.
6369	4	53	30	0		Suggest change "on" to "in" [Nina Hunter, South Africa]	Accepted.
4779	4	53	32	53	33	If "the global number of ETCs is not expected to decrease by more than a few percent due to anthropogenic change", then what is expected? That the number increases, or that it decreases by less than a few percent? Perhaps this whole sentence needs rewording. [Debra Roberts and Durban Team, South Africa]	Accepted.
4781	4	53	39	53	41	Suggest rewording: "The number of storms in the North Atlantic basin is uncertain. Michaelis et al., 2017 predict a decrease, while others (Colle et al., 2013; Zappa et al., 2013; Michaelis et al., 2017) predict an increase." [Debra Roberts and Durban Team, South Africa]	Accepted.
13965	4	53	42	53	43	Text refers to 'different definitions of cyclones' it would be helpful if SROCC could set out it's definition of cyclones in SPM and/or Executive Summary of relevant chapters. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Yes and thanks for your suggestion.
6371	4	53	44	0		Change "imply" to "implies" [Nina Hunter, South Africa]	Accepted.
4783	4	53	48	0		How much numerical data are available globally re: storm surge? Is it possible to generate a global map similar to 4.10 that shows the extra wave height due to storms, that could be added on to the mean sea level plus extra wave height, as suggested before? In other words, is it possible to give the policy maker a way to calculate a 'worst case scenario' for their locality? Or can this be done for them? [Debra Roberts and Durban Team, South Africa]	Thanks for your very good comments. The compound effects of sea level rise, storm surge and waves are assessed in chapter 6.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4785	4	53	51	0		How is "highly vulnerable" defined here? What makes these coastlines extra vulnerable, and are there other highly vulnerable coasts around the world? [Debra Roberts and Durban Team, South Africa]	Thanks for your comments. We added literature (Hallegatte et al., 2013, NCC)
6373	4	53	51	0		Insert "the" before "coasts"; remove "coast" after "Florida"; replace "at" with "on" [Nina Hunter, South Africa]	Accepted.
6375	4	53	52	0		insert "the" before "Persian"; change "area" after "protected" to "areas" [Nina Hunter, South Africa]	Accepted.
6377	4	54	1	0		Remove "of" [Nina Hunter, South Africa]	Accepted.
6379	4	54	2	0		Remove "in the" [Nina Hunter, South Africa]	Accepted.
6381	4	54	4	0		Change "is" to "are" [Nina Hunter, South Africa]	The high water events is regarded as the subject, and the predicate should be singular, i.e., is?
6383	4	54	9	0		Insert "a" before "2.5" [Nina Hunter, South Africa]	Accepted.
6385	4	54	10	0		Remove "TCs damages" [Nina Hunter, South Africa]	Accepted.
4787	4	54	12	0		Could you provide some actual numbers for "threefold between 1970 and 2010"? And where do these people live? [Debra Roberts and Durban Team, South Africa]	We reworded the sentence and removed this sentence due to the limited page space.
6387	4	54	13	0		Suggest change "This" to "The" [Nina Hunter, South Africa]	Accepted.
6389	4	54	17	0		Suggest remove "Besides" [Nina Hunter, South Africa]	Accepted.
6391	4	54	20	0		Please clarify: "resulting in severe risks at costs" [Nina Hunter, South Africa]	We reworded the sentence
6393	4	54	21	0		Change "is" to "are" [Nina Hunter, South Africa]	Accepted.
4789	4	54	40	0		What are "isopycnal motions"? "thermosteric mixed layer changes"? "halosteric contributions"? [Debra Roberts and Durban Team, South Africa]	taken into account - section was deleted
19993	4	54	41	54	41	Short explanation of halosteric contributions will increase readability or reference to a section where it's explained or a paper. [APECS Group Review, Germany]	taken into account - section was deleted
20219	4	54	41	54	51	Short explanation on Rossby waves will increase readability or reference to a section where it's explained or a paper. [APECS Group Review, Germany]	taken into account - section was deleted
19989	4	54	46	54	46	“The greatest uncertainty in SLA prediction is the specification of future wind conditions.” – was this demonstrated somewhere for decadal predictions? Can you provide a citation to this statement? In this paper it was shown that decadal predictions of surface zonal wind have large uncertainties over the ocean (based on CMIP5 decadal simulations): Strobach, E. & Bel, G. Clim Dyn (2017) 49: 3221. https://doi.org/10.1007/s00382-016-3507-7. Maybe alternative suggestion: "Surface winds drive the ocean circulations and, by that, affects the SLA predictions. Decadal predictions of surface winds have large predictions uncertainties over the ocean (Strobach and Bel, 2017) and this may be a major uncertainty source in regional sea-level predictions." [APECS Group Review, Germany]	taken into account - section was deleted
4791	4	54	49	0		What are "remotely-forced dynamics"? This entire section is too technical and would benefit from some rewording for non-specialists. [Debra Roberts and Durban Team, South Africa]	taken into account - section was deleted

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
19991	4	54	52	54	54	“Other uncertainties involved in dynamical predictions include observational initialization and incomplete model physics (Kirtman et al., 2013; Hu et al., 2017), such as the uncertainty in the spatial distribution of tidally-driven mixing (Melet et al., 2016).” What is the meaning of “dynamical predictions”? Did Kirtman show that the initial and model variabilities are relevant for decadal sea-level Alternative suggestion : "Other sources for SLA predictions’ uncertainties include uncertainty in the initial ocean conditions and incomplete model physics (Hu et al., 2017), such as the uncertainty in the spatial distribution of tidally-driven mixing (Melet et al., 2016)." [APECS Group Review, Germany]	taken into account - section was deleted
13967	4	55	7	55	8	It is unclear what is meant by 'no clear evidence that climate models are changing over time'. Is this referring to predictive modelling or something else? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	taken into account - section was deleted
10349	4	55	7	55	10	"we have low confidence in projections of SLA decadal variability " What are the implications ofthis for small islands? [Mahmood Riyaz, Maldives]	taken into account - section was deleted
16851	4	55	12	57	3	Section 4.2.3.6 on long-term scenarios beyond 2100 should be an absolutely central part of Chapter 4, as it is not enough to focus on the 21st century when it comes to projected sea level rise impacts. Currently, the long-term perspective does not receive the appropriate attention. Two pages on long-term sea level rise projections (without figure) of a 130 page Chapter on sea level rise and coastal impact is hardly acceptable. We urge the authors to revise/expand the section and add figure and table on long-term sea level commitments as was done in AR5 (WGI AR5 Chapter 13.5.4). Clark et al 2018 have recently published a very illustrative figure that could even be used as a template to elevate this crucial information to the SPM. Also, Mengel et al 2018 Nature Communications have established a clear link between near-term climate mitigation and 2300 sea level implications under Paris Agreement scenarios. This kind of information needs to be adressed and communicated adequately. [Government of Grenada, Grenada]	The long-term has a figure, in the SOD version in the next section 4.2.4. In the FD this will move to a new integrative upfront section and receive by that more emphasize. Furthermore there will be an executive summary statement on long term as well as text in the SPM on long term, so we believe the long-term will eventually be presented in a balanced way.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27471	4	55	12	57	3	The section for sea level rise beyond 2100 is largely qualitative. This is a problem because sea level rise has high inertia and lags behind global warming. The main consequences of 21st century emissions will therefore be felt only post 2100. Leaving out numbers for the centuries afterwards, shields the reader from important information on the sea level commitment of 21st century emissions. Deconto et al. (in review) provide numbers for 2300. The author team and the current state of research clearly allows for quantitative statements post 2100, which naturally come with large uncertainty. The missing numbers for 2200/2300 are a key deficit of the chapter in its current form. [Matthias Mengel, Germany]	Those numbers are shown in Figure 4.11 of the SOD and will be shown in section 4.1 from the FD. Figure 4.11 already clearly shows the divergence of scenarios after 2100. This message will further be emphasized in the executive statements of the chapter and the SPM.
28461	4	55	12	57	3	Section 4.2.3.6 on long-term scenarios beyond 2100 should be an absolutely central part of Chapter 4, as it is not enough to focus on the 21st century when it comes to projected sea level rise impacts. Currently, the long-term perspective does not receive the appropriate attention. Two pages on long-term sea level rise projections (without figure) of a 130 page Chapter on sea level rise and coastal impact is hardly acceptable. We urge the authors to revise/expand the section and add figure and table on long-term sea level commitments as was done in AR5 (WGI AR5 Chapter 13.5.4). Clark et al 2018 have recently published a very illustrative figure that could even be used as a template to elevate this crucial information to the SPM. Also, Mengel et al 2018 Nature Communications have established a clear link between near-term climate mitigation and 2300 sea level implications under Paris Agreement scenarios. This kind of information needs to be adressed and communicated adequately. [Government of Saint Lucia, Saint Lucia]	see previous 2 comments
6395	4	55	14	0		Suggest delete "follow" and insert "is followed" after "Paris Agreement" [Nina Hunter, South Africa]	changed accordingly
21821	4	55	14	0		Sentence incomplete [Robert Bell, New Zealand]	see previous comment
28623	4	55	14	55	14	"...higher than present..." ? [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly
33503	4	55	14	55	14	Grammar problem. [Government of United States of America, United States of America]	solved
17537	4	55	14	55	22	Solomon S., et al. (2009) Irreversible climate change due to carbon dioxide emissions, PROC. NATL. ACAD. SCI. USA 106(6):1704-1709, 1707. [Kristin Campbell, United States of America]	reference added

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17649	4	55	14	55	22	Solomon S., et al. (2009) Irreversible climate change due to carbon dioxide emissions, PROC. NATL. ACAD. SCI. USA 106(6):1704-1709, 1707, 1708 ("Anthropogenic carbon dioxide will cause irrevocable sea level rise.... An assessed range of models suggests that the eventual contribution to sea level rise from thermal expansion of the ocean is expected to be 0.2–0.6 m per degree of global warming (5). Fig. 4 uses this range together with a best estimate for climate sensitivity of 3 °C (5) to estimate lower limits to eventual sea level rise due to thermal expansion alone. Fig. 4 shows that even with zero emissions after reaching a peak concentration, irreversible global average sea level rise of at least 0.4–1.0 m is expected if 21st century CO2 concentrations exceed 600 ppmv and as much as 1.9 m for a peak CO2 concentration exceeding 1,000 ppmv."). [Durwood Zaelke, United States of America]	reference added
33505	4	55	14	57	3	The work of Conford et al. (Ann. Glac. 57(73) 2016 doi: 10.1017/aog.2016.13) should be discussed in this section, particularly in terms of some of the more extreme forcing / whole-ice-sheet response sections (e.g., the discussion of Golledge et al. and the remove-all-ice-shelves work), since it is the only model to yet do simulations of this scale (whole ice sheet) and duration (milennia) that also fully resolves grounding line / MISI dynamics. [Government of United States of America, United States of America]	this is discussed in section 4.2.4 and in the fifth paragraph of this section
16367	4	55	17	55	19	IPCC AR5 consistent 2300 RCP projections are available and should be presented here. Nauels et al. 2017a developed the AR5 consistent probabilistic SLR emulator of process-based projections to extend the projections presented in Church et al 2013 until 2300. Based on Levermann et al 2014 (SeaRISE) Antarctic dynamics, the 2300 results for all RCPs are shown in Figure 4 and Table 7 of Nauels et al 2017a. These conservative but AR5 consistent 2300 extensions present an advancement wrt multi-centennial AR5 estimates. The SROCC asssement, now also covering hydro-fracturing and MICI, could then nicely build on those projections, ultimately leading to Figure 4.11. [Alexander Nauels, Germany]	the new integrative section 4.1 builds on Table 13.8 from AR5 and the papers by Levermann, Golledge and Deconto to arrive at a long term view on sea-level rise
4793	4	55	19	0		"2.3 m per degree warming" - is that compared with pre-industrial? [Debra Roberts and Durban Team, South Africa]	yes w.r.t. pre industrial

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11119	4	55	20	0	22	The whole current paragraph is summarizing the overall picture for the Long term sea Level scenarios, discussing the role and uncertainties of the different macroscopic components. But from line 20-22 it seems that the only missing tile in the picture is the Marine Ice Cliff Instability suggested by Pollard and DeConto, like all the other models from the literature were irrelevant. If this discussion is actually based on a single model, there could be serious doubts concerning the plausibility of the conclusions. Please include a wider literature in the discussion. [Valentina R. Barletta, Denmark]	no the paragraph repeats the results from the ocean forcing as presented in Levermann et al. 2013. WE clarified this
15619	4	55	20	0	22	The whole current paragraph is summarizing the overall picture for the Long term sea Level scenarios, discussing the role and uncertainties of the different macroscopic components. But from line 20-22 it seems that the only missing tile in the picture is the Marine Ice Cliff Instability suggested by Pollard and DeConto, like all the other models from the literature were irrelevant. If this discussion is actually based on a single model, there could be serious doubts concerning the plausibility of the conclusions. Please include a wider literature in the discussion. [EUCE, Belgium]	see previous
6397	4	55	21	0		Insert "the" before "collapse"; suggest rephrase after "shelves": ", the suggested dominant mechanism for ice mass loss (DeConto and Pollard, 2016)." [Nina Hunter, South Africa]	changed accordingly
31193	4	55	26	55	26	Is this high confidence only based on the Marzeion reference? [Hans-Otto Poertner and WGII TSU, Germany]	the high confidence is based on the fact that there is a limited amount of ice available in small glaciers being 0.4 m so a maximum loss rate will be reached and then the rate decreases until they will all be gone. We added hence to clarify
29097	4	55	27	55	27	This result from Marzeion et al requires greater explication, suggest additional sentence as follows:"...Marzeion et al (2012). This is because, under low/moderate emissions scenarios (RCP2.6, 4.5) glaciers will have stabilized, though with loss of low-latitude glaciers and small remnants only of most mid-latitude glaciers; whereas under RCP8.5, the contribution to GMSL ceases because essentially all glacier ice except that at very high latitude and altitude will have been lost, so that no ice remains to melt and contribute further." [Pam Pearson, Sweden]	we clarified that we have RCP8.5 in mind
17539	4	55	29	55	33	Solomon S., et al. (2009) Irreversible climate change due to carbon dioxide emissions, PROC. NATL. ACAD. SCI. USA 106(6):1704-1709, 1707. [Kristin Campbell, United States of America]	reference added

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17651	4	55	29	55	33	Sea-level rise continues long after warming has ceased; see Solomon S., et al. (2009) Irreversible climate change due to carbon dioxide emissions, PROC. NATL. ACAD. SCI. USA 106(6):1704-1709, 1707, 1708 ("Anthropogenic carbon dioxide will cause irrevocable sea level rise.... An assessed range of models suggests that the eventual contribution to sea level rise from thermal expansion of the ocean is expected to be 0.2–0.6 m per degree of global warming (5). Fig. 4 uses this range together with a best estimate for climate sensitivity of 3 °C (5) to estimate lower limits to eventual sea level rise due to thermal expansion alone. Fig. 4 shows that even with zero emissions after reaching a peak concentration, irreversible global average sea level rise of at least 0.4–1.0 m is expected if 21st century CO2 concentrations exceed 600 ppmv and as much as 1.9 m for a peak CO2 concentration exceeding 1,000 ppmv."). [Durwood Zaelke, United States of America]	reference added
11121	4	55	32	0	33	Same as above. Those models do not cover the whole literature on the topic. [Valentina R. Barletta, Denmark]	all RCPbased long term models are mentioned so we added the Levermann et al. 2014 and DeConto 2019 paper
15621	4	55	32	0	33	Same as above. Those models do not cover the whole literature on the topic. [EUCE, Belgium]	all RCPbased long term models are mentioned so we added the Levermann et al. 2014 and DeConto 2019 paper
6399	4	55	32	0		Remove "a" [Nina Hunter, South Africa]	changed accordingly
6401	4	55	35	55	36	Suggest rephrase: "For Greenland, surface warming may lead to ablation becoming larger than accumulation, and the associated surface lowering increasing ablation further". [Nina Hunter, South Africa]	changed accordingly
19995	4	55	35	55	42	This paragraph discussed nonlinear threshold of Greenland ice-sheet. In AR5, most studies suggest a threshold higher than 2ºC global warming, only one study suggest a threshold lower than 2ºC.I think the conclusion shows much stronger connection to temperature targets in the Paris Agreement. Here a given threshold range between 1ºC and 4ºC breakes down the connection to the Paris Agreement. I suggest the authors give a more comprehensive assessment on Greenland ice-sheet threshold problem. Is the conclusion of AR5 still valid? Or more studies after AR5 suggest a threshold lower than 2ºC, or between 1.5ºC and 2ºC? Or even more studies suggest no threshold of Greenland ice-sheet at all? Or just maybe give a reference to the new 1.5 degree IPCC report. [APECS Group Review, Germany]	there is no new literature on this topic so we just repeat the statements in AR5

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29099	4	55	39	55	39	Cite also Robinson, A., Calov, R., Ganopolski, A. (2012): Multistability and critical thresholds of the Greenland ice sheet. Nature Climate Change [doi:10.1038/NCLIMATE1449], and add: "Robinson et al (2012) found a range of 0.8 to 3.2 degrees for this threshold, with a median value of 1.6 degrees, though over very long timescales." [Pam Pearson, Sweden]	we added the reference and stick to the church et al. assessment as there is no new literature
6403	4	55	42	0		Change "level" to "levels" [Nina Hunter, South Africa]	changed accordingly
28625	4	55	50	55	51	I'm not aware that the conditions required for ice shelf (re)formation have been robustly studied. But if they have, then please include a reference here. [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	we provide reference to the paper by DeConto and Pollard where this is suggested
16369	4	55	55	55	56	This finding is crucially important and has to be communicated more prominently. In general, one of the most frequently cited studies in this context by DeConto & Pollard 2016 (often referenced here without providing enough associated long-term informtionl) estimates a 2300 AIS GMSLR contribution of around 10 m under RCP8.5, and still around 4 m under RCP4.5. Process understanding has improved and may render some of the underlying assumptions invalid, but it is not an option to simply stay silent about these estimates that had a profound impact on the overall SLR narrative. If these numbers are not to be considered anymore, it has to be explained why. Otherwise, these and related uncertain projections still have to be communicated as an existing risk as they are far to worrying to ignore. Please revise, extend and provide potential quantitative long-term SLR potentials resulting from MISI. [Alexander Nauels, Germany]	The long-term commitment is discussed based on Golledge 2015, Levermann 2014 and Deconto et al. 2019. There are concerns about the rate of ice shelf decay in DeConto and Pollard 2016 as expressed in section 4.2.3.2. This topic is also covered in the new integratice section 4.1 .It furthermore comes back in the executive statements and the SPM.
6405	4	56	3	0		Remove "to" [Nina Hunter, South Africa]	changed accordingly
11123	4	56	4	0	7	The interaction (feedback) between ice and the solid Earth is the “great neglected” of this discussion. This feedback is at present poorly included in the ice models, but it has been shown theroretically (Adhikari et al. 2014, Konrad et al. 2015, Gomez et al 2015) to be potentially relevant at global scale on the 100-1000 yrs scale, not only at millenial time scale as suggested by the authors here. It has been shown to be actually important at the local scale (Barletta et al 2018), at the 10-100 yrs scale. And it has been hypothesized to have been a stabilizing factor in the Ross shelf retreat in the past (Kingslake et al 2018). So this section is widely incomplete, and this aspect could have been dealt with in some more detail in the previous sections, beside the almost exclusive focus given to the MICI. [Valentina R. Barletta, Denmark]	we believe the reviewer interpreted longer differently than it was intended so we improved the wording

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15623	4	56	4	0	7	The interaction (feedback) between ice and the solid Earth is the “great neglected” of this discussion. This feedback is at present poorly included in the ice models, but it has been shown theroretically (Adhikari et al. 2014, Konrad et al. 2015, Gomez et al 2015) to be potentially relevant at global scale on the 100-1000 yrs scale, not only at millenial time scale as suggested by the authors here. It has been shown to be actually important at the local scale (Barletta et al 2018), at the 10-100 yrs scale. And it has been hypothesized to have been a stabilizing factor in the Ross shelf retreat in the past (Kingslake et al 2018). So this section is widely incomplete, and this aspect could have been dealt with in some more detail in the previous sections, beside the almost exclusive focus given to the MICI. [EUCE, Belgium]	see previous
25841	4	56	4	56	7	There is an additional study addressing this issue maybe worth including (Konrad et al. (2015), Earth and Planetary Science Letters, https://doi.org/10.1016/j.epsl.2015.10.008). [Johannes Sutter, Germany]	added
33507	4	56	4	56	7	It probably makes more sense to reference and discuss more recent work of Gomez et al. (2015, Nat. Comm., DOI: 10.1038/ncomms9798) here and possibly elsewhere in this same section. [Government of United States of America, United States of America]	added
28627	4	56	5	56	5	Suggest replacing 'elastic' with 'viscoelastic'. This encompasses the combined elastic and viscous response to ice mass loss, with the latter process being potentially important in regions underlain by low viscosity upper mantle, e.g. some regions of West Antarctica (Barletta et al., 2018, referenced in this chapter) and the Antarctic Peninsula (Nield, G.A. et al., 2014. Rapid bedrock uplift in the Antarctic Peninsula explained by viscoelastic response to recent ice unloading, EPSL, 397, 32-41). [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28629	4	56	6	56	7	Suggest including reference to three additional studies that present projections of Antarctic Ice Sheet evolution that account for the negative feedbacks mentioned earlier in this sentence (the articles currently referenced describe the process, but do not specifically present projections): (1) Gomez, N., Pollard, D., and Holland, D.. (2015). Sea-level feedback lowers projections of future Antarctic ice-sheet mass loss. Nature Communications, 6, 8798, doi:10.1038/ncomms9798. (2) Konrad, H., Sasgen, I., Pollard, D., Klemann, V. (2015). Potential of the solid-Earth response for limiting long-term West Antarctic Ice Sheet retreat in a warming climate. EPSL, 432, 254-264. (3) Pollard, D., Gomez, N. & DeConto, R. M. Variations of the Antarctic Ice Sheet in a coupled ice sheet-Earth-sea level model: sensitivity to viscoelastic Earth properties. J. Geophys. Res. Earth Surf. 122, 2124–2138 (2017). [Pippa Whitehouse, United Kingdom (of Great Britain and Northern Ireland)]	changed accordingly
11125	4	56	18	0	32	This discussion has been already done twice before. [Valentina R. Barletta, Denmark]	the text has been shortened at this point to avoid repetition
15625	4	56	18	0	32	This discussion has been already done twice before. This text is redundant. [EUCE, Belgium]	the text has been shortened at this point to avoid repetition
6407	4	56	25	0		Suggest removing "in place" [Nina Hunter, South Africa]	we kept it else the meaning is unclear
29101	4	56	40	56	41	Confusing, is this meant to read, "Hence it is not possible to determine whether a low emissions scenario would prevent substantial future ice loss." ? [Pam Pearson, Sweden]	changed accordingly
2513	4	56	43	0	46	I think a shartper more urgent message could be crafted about the concepts in Clark et al. That is what we do now (this century) will determine sea level and its impacts for centuries. True thi is in the AR5 and elsewhere in this chapter, but it could be crafted more acutely. This message should be clear in the Summary. [John Church, Australia]	we decided to have an integrative section upfront which brings this sharper
16371	4	56	43	56	46	A follow-up study by Clark et al 2018 (NatCC comment "Sea-level commitment as a gauge for climate policy") provides a very important multi-centennial/millenial perspective that is currently lacking in this too short post-2100 section. While it is important to detail the potential long-term contributions for every major component, research on aggregated long-term SLR projections should be presented in more detail. The Clark et al study would help to more clearly highlight the long-term SLR commitment. [Alexander Nauels, Germany]	we added reference to this paper and added a sentence about it
22875	4	56	43	56	50	Where are these figures come from? On what bases? And what are the resources? [Government of Saudi Arabia, Saudi Arabia]	the assessment about Greenland is a repitition of AR5 as mentioned in the third paragraph of this section

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
16373	4	56	52	57	3	This summary section is too unspecific and does not cover the substantial progress in relevant SLR research since AR5. In general, Section 4.2.3.6 on long-term scenarios beyond 2100 does not provide sufficient detail on the exceptionally important issues of SLR commitment as well as the long-term SLR implications for strong mitigation scenarios (that are not as likely to experience the "deeply uncertain" Antarctic run-away effects). In the light of prominent SLR results presented in SR1.5 (which should at least be referred to), it is very important to cover these crucial aspects in the dedicated IPCC special report in more detail. Pattyn et al 2018 (https://www.nature.com/articles/s41558-018-0305-8) is not cited yet but should be discussed as they provide crucial information on the long-term SLR perspective and advances in process understanding relating to "deep uncertainty". Also, Mengel et al 2018 provided useful information on the 2300 SLR effect of further delaying emission reductions under strong mitigation. Multiple studies indicate that best case SLR scenarios (RCP2.6 and lower RF pathways) that 2300 SLR would be at least around 1 m. These kinds of numbers are extremely relevant for IPCC stakeholders and have to be added to the assessment. The Chapter 4 ES requires quantitative information on post-2100 SLR. [Alexander Nauels, Germany]	we bring across to the SPM "Long term evolution of the Antarctic Ice Sheet beyond the end of the 21st century is also characterized by deep uncertainty, as ice-sheet models lack realistic representations of some of the underlying physical processes. The few studies available addressing century to millennial timescales indicate multi-metre SLR for RCP8.5 (medium confidence), and a long term (multi-millennial) commitment to SLR from the loss of ice on Greenland and Antarctica." based on the integrative section 4.1 and this paragraph. In the SOD this information is covered in section 4.2.4. The information in this section is absorbed in 4.1

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
23201	4	56	52	57	3	How does this conclusion differ from AR5 and SR15? [Valerie Masson-Delmotte, France]	the 1.5 degrees report says: Sea level will continue to rise well beyond 2100 (high confidence), and the magnitude and rate of this rise depends on future emission pathways. The Ar5 says: t is virtually certain that global mean sea level rise will con-tinue beyond 2100, with sea level rise due to thermal expan-sion to continue for many centuries. The amount of longer term sea level rise depends on future emissions. The few available process-based models that go beyond 2100 indicate global mean sea level rise above the pre-industrial level to be less than 1 m by 2300 for greenhouse gas concentrations that peak and decline and remain below 500 ppm CO2-eq, as in scenario RCP2.6. For a radiative forcing that corresponds to above 700 ppm CO2-eq but below 1500 ppm, as in the scenario RCP8.5, the projected rise is 1 m to more than 3 m (medium confidence). This assessment is based on medium confidence in the modelled contribution from thermal expansion and low con-fidence in the modelled contribution from ice sheets. The amount of ocean thermal expansion increases with global warming (0.2 to 0.6 m °C–1) but the rate of the glacier contribution decreases over time as their volume (currently 0.41 m sea level equivalent) decreases. 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. Sea level rise of 1 to 3 m per degree of warming is projected if the warming is sustained for several millennia (low confi-dence). {13.5.4, Figures 13.4.3, 13.4.4}. SROCC has We have for RCP2.6 0.7 to 1.5 and for RCP8.5 3 to 9 m we will emphasise this difference better
23203	4	57	0	57		I am not convinced by the added value of this synthesis section and prefer that this is used to shape the ES. It does not use the confidence language as in the text. Please use it to sharpen the ES and improve its storyline. [Valerie Masson-Delmotte, France]	The section 4.2.4 is removed and absorbed in paragraph 4.1
22877	4	57	1	57	3	Lack of explanation and elaboration on the reason, rationale and science behind such assumptions. [Government of Saudi Arabia, Saudi Arabia]	we added an additonal paragraph to back up these statement which was in the SOD version provided in section 4.2.4
29103	4	57	1	57	3	This sentence/concept should appear in the SPM, along with the below conclusion. [Pam Pearson, Sweden]	In the SPM it is phrased as Long term evolution of the Antarctic Ice Sheet beyond the end of the 21st century is also characterized by deep uncertainty, as ice-sheet models lack realistic representations of some of the underlying physical processes. The few studies available addressing century to millennial timescales indicate multi-metre SLR for RCP8.5 (medium confidence), and a long term (multi-millennial) commitment to SLR from the loss of ice on Greenland and Antarctica.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
26155	4	57	5	58	25	This section is odd. Why a sort of summary in the middle of the chapter; also includes lots of repetition of what has been said. Delete? [Regine Hock, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
11127	4	57	5	59	4	The beginning of this section “Synthesis of the Physics of Sea Level for Low-lying Islands and Coasts” is out of focus. The whole page 57 and 58 are an inaccurate repetition of the present knowledge about the predicted ice-sheet contribution to the sea level, widely discussed in the previous section. The first mention of “islands” is at page 58, line 41, with a very generic statement of “higher risk of extreme events in the future”. All this part can be cut without losing anything. Moreover, the ice sheet modeling is discussed again and again only in terms of the two contribution to the modeling (MISI and MICI, page 57 Line 22-35, . page 57, Line 47-50, page 58 Lines 8-12), as they were encompassing all the physics of the ice dynamics. The language is also poor, with sentences without verbs, subordinates without the principal sentence (e.g. page 57, Line 47-50) [Valentina R. Barletta, Denmark]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
15627	4	57	5	59	4	The beginning of this section “Synthesis of the Physics of Sea Level for Low-lying Islands and Coasts” is out of focus. The whole page 57 and 58 are an inaccurate repetition of the present knowledge about the predicted ice-sheet contribution to the sea level, widely discussed in the previous section. The first mention of “islands” is at page 58, line 41, with a very generic statement of “higher risk of extreme events in the future”. All this part can be cut without losing anything. Moreover, the ice sheet modeling is discussed again and again only in terms of the two contribution to the modeling (MISI and MICI, page 57 Line 22-35, . page 57, Line 47-50, page 58 Lines 8-12), as they were encompassing all the physics of the ice dynamics. The language is also poor, with sentences without verbs, subordinates without the principal sentence (e.g. page 57, Line 47-50) [EUCE, Belgium]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
11459	4	57	7	57	9	Not necessary. The section title is self explanatory. So this paragraph doesn't really help the discussion. [Anson Cheung, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31195	4	57	11	57	35	There is a lack of cross-references to sections that provide the evidence for the synthesis here. [Hans-Otto Poertner and WGII TSU, Germany]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6409	4	57	13	0		Insert "have been" after "to"; remove "be" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
13969	4	57	17	57	18	What is 'modest warming' defined as in this context? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6411	4	57	18	0		Suggest change "finding" to "findings" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
2185	4	57	24	57	24	"Eemian" is the local European term - I would argue for consistently using "Last Interglacial" [Robert Kopp, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
33509	4	57	24	57	28	A citation of Sun et al. (2016, doi: 10.1017/aog.2016.27) would add important context to this paragraph. Their numerical modeling suggests that Aurora basin (inland of Totten glacier) is *not* likely to see significant mass loss even with a complete loss of Totten and neighboring ice shelves. [Government of United States of America, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6413	4	57	31	0		Replace "constraint" with "constrained" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
10837	4	57	37	57	44	This paragraph doesn't really read well [Magnus Hieronymus, Sweden]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
23725	4	57	37	57	44	This paragraph doesn't really read well, please redraft for lucidity. [Government of Sweden, Sweden]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3547	4	57	38	57	39	The word "smaller" appears twice in this sentence which doesn't make sense. I think the first "smaller" should be deleted. [Sonya Legg, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6415	4	57	38	57	39	Sentence may need rephrasing: smaller than what? Also "smaller" mentioned twice - suggest taking out first mention. Change "insight" to "insights". [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
13971	4	57	38	57	39	Is this sentence trying to say that the rate of SLR increased towards the end of the 20th Century? As currently drafted this is unclear. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6417	4	57	41	0		Suggest changing "difficulties" to "difficulty" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
32341	4	57	46	58	34	The key finding that it is only if emissions continue to grow until late this century that mult-meter sealevel rise would likely to occur in the next century (evident in Figure42.11 is extremely important. Yet, it gets buried in this rather narrow technical discussion. It constrains the nature of the adaptation challenges and underpins the importance of emissions reductions during current generation. There should be elevation of this point and very consistent messaging with Executive Summary point 4, where the importance is lost, and in the SPM. [Donald Boesch, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
13973	4	57	47	57	50	It is unclear what this sentence is trying to say, is it saying that improved understanding of ice sheet behaviour is improving our ability to model future changes? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
33511	4	57	52	57	54	It seems like it would also be fair to note here that, in addition to semi-empirical models not implicitly capturing MISI, most of the low-resolution (e.g., 10-20 km, as noted in Table 4.2) Ant. Ice sheet models discussed in this report can also only be partially trusted in their ability to capture MISI accurately (since we know that spatial resolution of ~1km or less is necessary to capture MISI accurately, as shown by grid-resolution convergence studies in various papers of Cornford et al.). [Government of United States of America, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2187	4	57	54	57	55	For 2050, it seems important to note not only the limted scenario dependence, but also the fairly strong agreement among methods -- and even of a simple quadratic extrapolation of eg Nerem et al 2018 [Robert Kopp, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6419	4	57	55	0		Suggest changing "simulation" to "simulations" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6421	4	58	1	0		Insert "the" before "21st" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6423	4	58	5	0		Suggest change "present" to "presents" [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6425	4	58	8	58	10	Repetition of "deep uncertain" - consider changing one instance to other words for variability [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
12087	4	58	14	58	15	“make it impossible to predict the future evolution” is a sentence of inaccurate expression. The significant difference in prediction resulting from different scenarios reflects the difference in social and economic development, which is not the cause of unpredictability. Please note the difference between ‘prediction’ and ‘projection’. [Government of China, China]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
16375	4	58	14	58	15	Scenario uncertainty on long time scales is always dominant but has never prevented an IPCC assessement to provide information on specific plausible pathways. While it is impossible to predict the future evolution with certainty, there is enough valuable information, in particular for strong mitigation pathways, that would allow for useful estimates with associated uncertainties. Simply saying impossible does not satisfy the task given to the authors to assess the information on long-term SLR. Also, if you call this an impossible task, you would have to remove Figure 4.11. [Alexander Nauels, Germany]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
17541	4	58	14	58	25	This non-linear aspect of the ice sheets contributes to uncertainty about the timing and extent of their impact on sea levels, where increased warming leads to increased forcing that leads to increased spread of possibilities; see Good P., et al. (2015) Nonlinear regional warming with increasing CO2 concentrations, NATURE CLIMATE CHANGE 5:138–142; and Good P., et al. (2016) Large differences in regional precipitation change between a first and second 2 K of global warming, NATURE COMMUNICATIONS 7(13667):1–8. [Kristin Campbell, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
17653	4	58	14	58	25	This non-linear aspect of the ice sheets contributes to uncertainty about the timing and extent of their impact on sea levels, where increased warming leads to increased forcing that leads to increased spread of possibilities; see Good P., et al. (2015) Nonlinear regional warming with increasing CO2 concentrations, NATURE CLIMATE CHANGE 5:138–142, 140–141 (“Nonlinearity has implications not just for the ensemble mean, but also for the spread of model projections. In general, an increased spread at higher forcing should be expected: the relative importance of nonlinear mechanisms grows with increasing forcing, so their contribution to model spread does likewise. Conceptually, this can be thought of as including an extra uncertain process at higher CO2 concentrations. This inflation in model spread at higher forcing is large when nonlinearities are uncertain, and seems to be especially relevant for change per kelvin of global warming.”); and Good P., et al. (2016) Large differences in regional precipitation change between a first and second 2 K of global warming, NATURE COMMUNICATIONS 7(13667):1–8, 2 (“Nonlinear mechanisms are those inconsistent with linear system theory. These may include state-dependent feedbacks, such as the sea-ice albedo feedback (which vanishes for large or zero sea-ice cover). Nonlinear mechanisms can cause climate patterns to differ at different levels of forcing. For example, if an equivalent of RCP8.5 was run with double the forcing, linear mechanisms would show exactly double the response compared with the standard RCP8.5, but nonlinear mechanisms would not. Nonlinear mechanisms have been demonstrated in a few models for very high-forcing levels, or under idealized CO2-forced experiments, for global and regional-scale precipitation, warming and ocean heat uptake. In one model study using idealized experiments, nonlinear precipitation change over tropical oceans was associated with interactions between pairs of approximately linear mechanisms (for example, simultaneous moisture increases and circulation shifts). Nonlinear behaviour of the Indian Summer Monsoon associated with the positive moisture advection feedback has also been proposed.”). [Durwood Zaelke, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13975	4	58	16	58	19	Should the 'presumably' be included in the text? Are there still uncertainties in the tipping points referred to? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
30453	4	58	21	58	22	Improved insights to this problem may arise from physical modelling used in connection with dedicated multi scale monitoring systems [Michele Capobianco, Italy]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
29105	4	58	22	58	23	This conclusion belongs in the SPM, preferably together with the above. [Pam Pearson, Sweden]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
17259	4	58	27	58	28	This is a very useful figure, clearly illustrating the increasing uncertainty with time. [Nick Golledge, New Zealand]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
29107	4	58	27	58	34	This figure is extremely helpful - kudos! [Pam Pearson, Sweden]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
32305	4	58	27	58	34	Figure 4.11: This figure might be very important. It should be made "rock-solid" (with a good description of the range of uncertainty, of course), and the vertical scale should be expanded so that a better resolution is shown (there is no point in going beyond 10m). Once that is done, this figure should be included in the SPM, as policy-makers are interested to know the evolution beyond 2100 as well. [Jean-Pascal van Ypersele, Belgium]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
31197	4	58	28	58	29	Figure 4.11 synthesizes the long-term scenarios only. For this synthesis section of the whole first part of the chapter, this is a somewhat unbalanced emphasis, since the observations and near-term projections are policy-relevant as well and important for the following part of the chapter on risks and responses. Suggest complementing by a second figure detailing the short-term responses unil 2100. [Hans-Otto Poertner and WGII TSU, Germany]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
4795	4	58	29	0		This is not a "Schematic illustration". Simply say "Global mean sea level over time ..." [Debra Roberts and Durban Team, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31367	4	58	29	0		Could this figure be complemented by a second one (e.g. building on Figure 4.7) with a magnified view of what happens until 2100. Has the existence of tipping points been sufficiently considered? [Hans-Otto Poertner and WGII TSU, Germany]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
594	4	58	29	58	34	What do the error bars here represent, 1 sd? This figure should be emphasized more in the text. [Jenna Pearson, United States of America]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
16377	4	58	29	58	34	Figure 4.11: How are the non-Antarctic contributions calculated post 2100? Please be more specific. Currently, the caption can be understood in a way that only Antarctic dynamics are added to 2100 estimates for the period 2100 to 2500, which would not be sufficient for providing post-2100 estimates. [Alexander Nauels, Germany]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
6427	4	58	31	0		"long time scales order 500 years" - is "in the order of" meant? Consider rephrasing; "on top of" - consider replacing with "in addition to"? [Nina Hunter, South Africa]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
8535	4	59	0	0		The choice of these 4 case studies should be explained. Why these locations? [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	The intention of the section was to bridge between the physics and the impacts. The information is now used even earlier in the chapter in an integrative section before the physical understanding is presented in order to reach out to non-physicists.
11129	4	59	0	74		All those parts on the factors impacting the consequences of climate change related events is well written, easy to read, and reasonable. This is probably also due to the fact that the studies addressing the complex interplay of human, social and environment related contribution to the actual damages, risks and their mitigation are still at the very beginning. [Valentina R. Barletta, Denmark]	Thank you for this positive feedback
15629	4	59	0	74		All those parts on the factors impacting the consequences of climate change related events are well written, easy to read, and reasonable. This is probably also due to the fact that the studies addressing the complex interplay of human, social and environment related contribution to the actual damages, risks and their mitigation are still at the very beginning. [EUCE, Belgium]	Thank you for this positive feedback

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
8669	4	59	0	122		it maybe consider this reference : Maryam Irani,Alireza Massah,Asghar Bohluli,Hamid Alizade,2018,The elevation of the Persian Gulf and Oman Sea is influenced by climate change in the coming periods,Journal of Natural Geography Research. Sea level changes are different on a global scale. Sea level in the southern coast of Iran will increase on a local scale more than the global scale, and in the 21st century there will be an increase in sea level from 29 to 93 cm in south of Iran. [Government of Iran, Iran]	unclear to which section this refers
8671	4	59	0	122		it maybe consider this reference : Javid Pegah, Naser Farrokhi, Mohammad Reza Bakhtiyarizadeh and Siamak Behzadi, 2018, Review of global warming on coral ecosystems depletion of the world and the Persian Gulf, National Conference on Climate Change and Aquatic Ecosystems. Persian Gulf corals have a high tolerancein threshold in comparison with the corals of other areas and can tolerate temperatures higher than 36 C, so they have been damaged less than the others. [Government of Iran, Iran]	unclear to which section this refers
8673	4	59	0	122		it maybe consider this reference : Yazdanpanah, Maryam; Ali Nasrollahi; Mohammad Reza Shokri and Keyvan Eludali Khaneghah, 2018, Heating Effect on Macrobenthes of the Persian Gulf (Bushehr), National Conference on Climate Change and Aquatic Ecosystems. An increase of 3 degrees of water temperature due to global warming can affect the structure of the diversity and frequency of macrobenthoses in the Persian Gulf and increase their abundance in the next century. [Government of Iran, Iran]	unclear to which section this refers
8675	4	59	0	122		it maybe consider this reference : Sidamin Allah Taghavi Motlagh, 2018, Evaluation of Vessel Species Vulnerability in Persian Gulf and Oman Sea Under Climate Change Based on Demographic Parameters, National Conference on Climate Change and Aquatic Ecosystems. Sea ecosystems are getting warmer and less oxygen and eventually becoming more acidic. Aquatic species with a high degree of inherent vulnerability include: Cetera, Fish Tuna, Fish Eaters, Catfish, Sharks. [Government of Iran, Iran]	unclear to which section this refers

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
8677	4	59	0	122		it maybe consider this reference : Saeedeh Manjbari Mohsen Farzin, 2018, Investigating Climate Change Detection on the Urmia Lake Basin, National Conference on Climate Change and Aquatic Ecosystems. Urmia Valley is lined with natural salty lakes in the center of a drainage area. Among the world's lakes, it is the 20th largest salt lake in Iran and the Middle East. The importance of Lake Urmia and its drying process in recent years, its causes and methods of preservation have become increasingly important. The cause of this phenomenon can be explained by two main reasons. The most important one is climate change. [Government of Iran, Iran]	unclear to which section this refers
21823	4	59	2	59	3	This sentence on adaptation is an oversimplification and can give a misguided impression to decision-makers for areas more imminently at adaptation thresholds. In areas where the ESL distribution is relatively flat compared to RSL, moderate coastal flooding events will become much more common in the next few decades to mid-century and actually drive demand for adaptation in low-lying areas that already are exposed to 1% AEP events. In these cases, the Antarctic contribution will be a minor player as the various SLR projections for RCP's are relatively close together in the near term. [Robert Bell, New Zealand]	section has been removed
16379	4	59	7	66	2	Box 4.1: The current placement of the Box does not make much sense as it preempts much of the content that is presented in more detail in the following sections. Maybe put at the end of the Chapter? Also, the readability and clarity of the box could benefit from using a more consistent approach for the presentation of the three examples regions, i.e. same section heading format and table format and length (can NYC and Shanghai be separated?). [Alexander Nauels, Germany]	Taken into account and decided that the best location for Box 4.1 was as a bridge between 4.2 and 4.3,with edits for improved cross-case consistency.
23389	4	59	9	66	1	Box 4.1 is very helpful for readers to understand the Chapter 4. But the title of “Case Studies of Coastal Hazard and Response” is not completely consistent with its text, which includes not only Hazard, but also Exposure, Vulnerability and Risk. The place Box 4.1 is therefore suggested to be put after section of 4.3; or, the Box 4.1 could be seperated into two boxes, in which Box 1 is for Case Studies of Coastal Hazard and put after subsection 4.2, and Box2 is for Case Studies of Exposure, Vunerability and Risk and put after subsection 4.3. [Rongshuo Cai, China]	Rejected. Although the reviewer is correct that the box focuses on risk and response, the detailed numerical analysis is about the hazard, with vulnerability, exposure, and risk discussed as part of response.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27931	4	59	9	130	26	Include reference Fernandino et al. (2018). Ecosystem-based management of coastal zones in face of climate change impacts: Challenges and inequalities. Journal of Environmental Management, 2015, 32-39. https://doi.org/10.1016/j.jenvman.2018.03.034 [Gerson Fernandino, Brazil]	Noted - this study does not add empirical evidence for assessment in 4.4.2.3.
27059	4	59	11	0		The paragraph staring at line 11 should explain why these specific case studies have been selected. Are they showing a geographical range? Are they thematic? Are these unique or prototypical situations? A bit more elaboration on this would help readers to understand why these case studies have been chosen over others. In addition, it would be good to point out that in certain cases adaptation measures (responses) were only taken, or are still in the planning and implementation phase, after a disaster took place. It will be important governments and municipalities take a more pro-active planning approach in order to prevent loss of lives, ecosystems and economic activities. [Kees Lokman, Canada]	Taken into account: they were chosen because they are representive of the Chapter's focus on low lying islands, coastal cities and communities, and deltas, robust information was available, and past experience and future plans to manage risks related to SLR allow many relevant lessons and good practices to be identified.
596	4	59	17	59	23	Is it possible to put error bars on the Fiji panel as well? [Jenna Pearson, United States of America]	We included error bars but they are small compared to the other localities
4027	4	60	0	60		Resolution of Box 4.1, Figure 2, needs to improved to a better and clearer quality illustration. [Lim Lee-Sim, Malaysia]	Figure deleted.
23205	4	60	0	60		Illustrative figure but does not convey a sense of an assessment : level of scientific understanding, confidence…? [Valerie Masson-Delmotte, France]	As noted in the caption, that is not the itent of the figure; it is intended to provde background context
4797	4	60	1	0		What exactly does a factor 14 (>1000) mean ? That the 1-in-100yr even now happens every 1000 years? If Figure 4.9 is well developed, with clearer caption, then this Figure becomes redundant. [Debra Roberts and Durban Team, South Africa]	We improved the caption of the figure to explain in more detail the meaning
6429	4	60	1	0		Check two references to "1000" - is this correct for Lautoka? [Nina Hunter, South Africa]	We improved the caption of the figure to explain in more detail the meaning
19997	4	60	5	60	12	Where are the references? [APECS Group Review, Germany]	Taken into account: References are included in the revised box for the FGD.
6431	4	60	9	0		Suggest inserting "they" before "entail" [Nina Hunter, South Africa]	Revised in the FGD
3029	4	60	14	60	15	Box 4.1, Figure 2: in this figure, the terms runup should be replaced by storm surge; Storm surge should be added to the predicted tide (and not the max of tidal range, especially because there is the ENSO variability superimpozed to that). I note that compared to figure 4,2, this figure highlights the needs to consider ENSO variability (and assets at risk?), but that it could be combined in a single figure with figure 4,2 quite easily. [Goneri Le Cozannet, France]	Taken into account: Fig 2 has been removed from the box.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3961	4	60	15	60	15	Box 4.1, figure 2: I think discarding this figure might not make that much of a difference. [Aakash Sane, United States of America]	Taken into account: Fig 2 has been removed from the box.
31199	4	60	15	60	16	Box 4.1, Figure 2 should also show mangroves, since they are an important natural barrier and often 'sacrificed', as you also refer to in the text. [Hans-Otto Poertner and WGII TSU, Germany]	Noted: Fig 2 has been removed from the box.
8537	4	60	20	60	21	the time period (between which years) of 'long-term' needs to be given here [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	(1992 - 2018) inserted in FGD
6435	4	61	0	0		Change "reduced risks" to "reduce risks" [Nina Hunter, South Africa]	Revised in the FGD
33513	4	61	1	61	1	This traditional engineering approach to "100-yr design floods" can become less relevant under climate change as land usage and flood resilience can decrease, producing traditional 100-yr design flood damage at higher frequencies than 100-yr. This issue, that the traditional 100-yr design scenario may not apply under climate change, should be made and is implicitly alluded to in Box 4.1. [Government of United States of America, United States of America]	Rejected. All literature assessed still uses the 0.01/yr chance flood as a reference point. Where this reference point may change in the future is speculative.
6433	4	61	3	0		Suggest changing "characteristic" to "characteristics" [Nina Hunter, South Africa]	Revised in the FGD
4799	4	61	20	0		This table seems quite vague. Similarly the next two tables. There seems to be overlap between them. [Debra Roberts and Durban Team, South Africa]	Tables in Box 4.1 have been elaborated further and wording more distinct for each case. However, since the right hand column refers to criteria derived in SROCC, there willinevitably be some overlap in language.
15085	4	61	20	61	21	Table caption for Table Box 4.1, Tab.1 is the same as for Tab.2 and Tab.4, which is confusing to the reader. Please state clearly in the table caption that the tables are specific for the case studies under discussion (e.g. Nadi municipality, Fiji; NYC, Shanghai); please also consider changing the first row to a "update consistent with SROCC-assessment", or "new/updated assessment consistent with SROCC). [Government of Germany, Germany]	There is inevitably considerable overlap in table captions but we think it valuable to have the information there for readers who go to only one or two of the tables. The headings of the two main table columns have been revised.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
23391	4	62	3	64	1	It is a quite good case for analyse and indicate the coastal flood hazard, vulnerability and adaptaion measures throught ""A Comparison of Coastal Flood Hazard, Vulnerability and Adaptation Measures between New York City and Shanghai". Both coastal mega-cities faced the adverstly cascading impacts of sea level rise, hurricane/typhoon, surge and the related risk in the late 21st century. However, there are references which are closely linked to hazard and risk or socical vulnerability and deserve the author pay attention on or cited, i.e., : 1) Garner, A. J. et al., 2017: Impact of climate change on New York City's coastal flood hazard: Increasing flood heights from the preindustrial to 2300 CE. Proceedings of the National Academy of Sciences, 114 (45), 11861-11866, doi:10.1073/pnas.1703568114; 2) Gu, Du, Liao, et al, 2018, A hierarchical pattern of urban social vulnerability in Shanghai, China and its implications for risk management. Sustainable Cities and Society, 41(2018), 170-179. Based on the investigation data of 5432 neighborhoods (residential committee, or juwei in Chinese) in Shanghai, this paper presents a hierarchical pattern of urban social vulnerability by an Index assessment, which is meaningful and helpful for how to decrease the vulnerability and building capacity to address the flooding disaster and risk. [Rongshuo Cai, China]	Thank you for this positive feedback; will consider the references but given the limited space we cannot reference all and some are not directly relevant to the text though either
9909	4	62	3	64	42	The comparison between Shanghai-New York, the Nile Delta in Egypt are well developed, but could be better synthetized, in order to safe space. [Úrsula Oswald Spring, Mexico]	Noted and shortened
2393	4	62	22	62	32	Concerning the city of Shanghai, the rate of 5mm/yr is a target value for Shanghai Municipality. As described by Damoah-Afari P. et al., (Detecting ground settlement of Shanghai using Interferometriic INSAR techniques, 2008, The International Archives of Photogrammetry, Remote Sensing, and Spatial Information Sci., vol XXXVII, Part B7, p.117-123) the city was stuck by a cumulative subsidence of 2,6m from 1921 too 1963; after important measures concerning groundwater usage, the rate decreased to about 10mm/yr in 2002, but with intensive construction of skyscrapers, problems of geotechnical disorders and collapse of buildings are becoming more and more frequent (Sinking or soaring?.., Global Time, web edition, sept.2017) [georges VACHAUD, France]	The 5mm/yr has been validated by Shanghai officials; the larger numbers in the references are years ago (5-10 yrs) when there are aggressive urban development;
6437	4	62	23	0		Remove "an" [Nina Hunter, South Africa]	not clear which part it refers to
6439	4	62	26	0		Remove "of"; insert "the" before "Land" [Nina Hunter, South Africa]	deleted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
33515	4	63	8	63	8	Lower (Manhattan) has a grammatical/consistency issue; suggest (e.g., lower Manhattan). Note that the e.g. of in Queens for vegetation may be improved if wetland or salt marsh vegetation was specified. [Government of United States of America, United States of America]	Not clear which the specific suggestions mean
6441	4	63	22	0		Replace "demolishing" with "demolition" [Nina Hunter, South Africa]	deleted
6443	4	63	29	0		Make "structure" plural; insert "the" after "interpreting" [Nina Hunter, South Africa]	deleted
27061	4	63	29	0		The paragraph that starts at line 29 could be expanded to discuss the role of design competitions, such as Rebuild by Design, which led to the development of the Big U project, to involve multiple stakeholders, residents and jurisdictions in co-developing adaptation strategies and identify new funding sources and/or mechanism. [Kees Lokman, Canada]	Good suggestion but given the space limit, need to be discussed further
6445	4	64	0	0		Remove fullstop after "local" [Nina Hunter, South Africa]	unclear to which section this refers
6457	4	64	0	0		Why do two of the figures in the table have two decimal places and the rest only one decimal place? [Nina Hunter, South Africa]	unclear to which section this refers
8539	4	64	0	66		Discuss Eman Ghoneim , Jehan Mashaly , Douglas Gamble , Joanne Halls , Mostafa AbuBakr Nile Delta exhibited a spatial reversal in the rates of shoreline retreat on the Rosetta promontory comparing pre- and post-beach protection. Geomorphology, Volume 228, 2015, 1 – 14 in this section [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Could not include this due to space limitations
3031	4	64	1	66	20	For the Egypt case study, Frihi et al. 2010 is a good reference explaining the coastal protection context. Frihy, O. E., E. A. Deabes, S. M. Shereet, and F. A. Abdalla (2010), Alexandria-Nile Delta coast, Egypt: Update and future projection of relative sea-level rise, Environ. Earth Sci., 61, 253–273. [Goneri Le Cozannet, France]	reference added.
9911	4	64	3	66	1	The comparison between Shanghai-New York, the Nile Delta in Egypt are well developed, but could be better synthetized, in order to safe space. [Úrsula Oswald Spring, Mexico]	unclear to which section this refers
32313	4	64	3	66	2	There is no mention of the dangers of salinization in the Nile Delta. Isn't it an issue of increasing importance with GMSL rise, both for freshwater and for agriculture? [Jean-Pascal van Ypersele, Belgium]	Accepted and mentioned
22009	4	64	11	64	11	This is a VERY strange way to start a paragraph. [David Schoeman, Australia]	text removed
6447	4	64	13	0		Make "constitutes" singular [Nina Hunter, South Africa]	Noted
6449	4	64	14	0		Make "wetlands" singular; insert "the" before "fish" [Nina Hunter, South Africa]	Noted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32303	4	64	17	64	21	This paragraph should prominently mention the threat to the 10+ million of Egyptians living less than 1m above sea level, their lievelihood, their agricultural land, etc. The consequences of even a 50 cm rise in sea level would be catastrophic without strong protection measures, or retreat. The potential of these measures should be better assessed. The present text is very vague from that perspective. [Jean-Pascal van Ypersele, Belgium]	More details to be found in the literature in the first paragraph in order to save space
6451	4	64	20	0		Insert "the" before "northern" [Nina Hunter, South Africa]	Noted
6453	4	64	21	0		Insert "the" before "year"; suggest inserting "a" before "eustatic" [Nina Hunter, South Africa]	Noted
2395	4	64	23	64	27	I do not have experience on the Nile Delta, but considering the Mekong delta, a fairly similar case in term of geological formation and groundwater extraction for agriculture, the rate of subsidence given in Table 3 (from 0,4 to 3 mm/yr.) seems to be extremely small. In comparison data obtained by INSAR and PALSAR interferograms for the Mekong delta by Erban et al., (Groundwater extraction, land subsidence and sea level rise in the Mekong Delta, Vietnam, 2014, Environmental Research Letter, IOP Science, vol.9, nb.8) report an average rate of 16mm/yr, yielding to a possible average subsidence of the delta closed to 1m by mid century, a number corresponding to the average elevation above the actual sea level... [georges VACHAUD, France]	We report the literature values on subsidence with low confidence.
6455	4	64	26	0		Suggest swopping comma and semi-colon [Nina Hunter, South Africa]	Noted
22011	4	64	30	64	30	This table is taking up several lines whilst adding only a tiny amount of information. Can these numbers not just be moved into the text? [David Schoeman, Australia]	Prefer to leave it as its
3033	4	64	30	64	31	Box 4.1, Table 3: I suggest to add the caveat that the rates provided for Alexandria (and possibly also Al Burulus and Port Said) are averages and that there is significant local variability superimpozed to these rates) (see e.g. InSAR studies such as Fig 1 in Wöppelmann et al 2013. Wöppelmann, G., Le Cozannet, G., De Michele, M., Raucoules, D., Cazenave, A., Garcin, M., ... & Santamaría-Gómez, A. (2013). Is land subsidence increasing the exposure to sea level rise in Alexandria, Egypt?. Geophysical Research Letters, 40(12), 2953-2957.) [Goneri Le Cozannet, France]	Its clear that they are averages (local variability) as we mentioned different opinions. We also no refer ot higher observed rates at a specific location.
6459	4	64	35	0		Was "Ethiopia" meant here? [Nina Hunter, South Africa]	Yes
6461	4	64	39	0		Change "twenty-first" to "21st" for consistency [Nina Hunter, South Africa]	text removed
6465	4	65	0	0		Suggest removing "2.9 million in 1986, 3.3 million in 1996, and" as it is unnecessary [Nina Hunter, South Africa]	Noted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6467	4	65	0	0		Suggest removing "The Nile Delta … agricultural land" as it is repetition from the text on page 64 [Nina Hunter, South Africa]	unclear to which section this refers
6469	4	65	0	0		Remove "entire" as it is already said with "throughout" [Nina Hunter, South Africa]	Noted
6471	4	65	0	66		Only some of the text in the table is referenced while others are not [Nina Hunter, South Africa]	Referencing made more uniform with most referencing for table values given in caption or in text.
13977	4	65	1	65	2	What does 'integrated coastal zone management' refer to both in this section/chapter and the wider SROCC? Is there a consistent definition being used? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	This meaning of the phrase is given depth by the associated references.
29925	4	65	6	65	17	here, as elsewhere in the chapter, it would be good to have a clearer discussion of hard vs soft coastal protection, to be very clear when hard might be preferred and why, as well as with what potential consequences. This is discussed elsewhere in the chapter, but the discussion is not totally consistent across sections [Anna Zivian, United States of America]	see section 4.4
32311	4	65	6	66	2	Reading this text, it is hard to understand whether the measures taken or planned will prevent most or some of the damage expected from GMSL rise in the Nile Delta, given the severity of the challenges described earlier in the box. Has this not been assessed? [Jean-Pascal van Ypersele, Belgium]	The gap between current defenses and future risk is brought out more fully now.
6463	4	65	9	65	10	Suggest removing "being"; change "committing" to "committed"; suggest changing "the urgent needs for Alexandria" to "Alexandria's urgent needs" [Nina Hunter, South Africa]	considered and also the text changed
32309	4	65	16	65	17	It would be interesting to know a little more about those "migration and human security dimensions" [Jean-Pascal van Ypersele, Belgium]	considered briefly in the Box 4.1, Table 4
9611	4	65	20	0		The second row, second column description of actions in Egypt should be shortened by at least one-third; it contains too much detail for a box and is inconsistent with descriptions in the other rows. [Government of France, France]	Accepted
29927	4	65	20	66	1	shorten the text in the second row, third column -- too much information [Anna Zivian, United States of America]	Accpeted- Semicolons were replaced where appropiate
20003	4	66	9	66	9	Change "demonstrates" by "highlights". [APECS Group Review, Germany]	Accepted - Text modified
20021	4	66	12	66	12	"in the three oceans": name the 3 out of the 5 existing oceans that you refer to. [APECS Group Review, Germany]	Accepted - Text modified
9613	4	66	12	66	13	Which "three oceans"? They should be named. [Government of France, France]	Accepted - Text modified
20005	4	66	16	66	16	What do you mean by compount events? Is that examples, case studies? Please clarify the terminology. [APECS Group Review, Germany]	Rejected - The "coumpound event" sub-section has been removed from the Final Draft. Note however that compound events are defined in the SROCC Glossary (final draft).
20007	4	66	16	66	16	Replace "It concludes" by "The section concludes". [APECS Group Review, Germany]	Accepted - Text modified
20009	4	66	17	66	17	Remove the capital letters in "Reasons for Concern". [APECS Group Review, Germany]	Accepted - Text modified (no more mention in the final introduction of the RFCs)

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20011	4	66	18	66	18	Maybe change: "and includes a synthesis figure on the future risks of impact to illustrative geographies and with/without successful adaptation" by " and includes a synthesis figure evaluating future risks of SLR in different adapation scenarios". [APECS Group Review, Germany]	Accepted - Text modified
20013	4	66	18	66	18	Remove "To allow for a global picture", start the sentence with "This section (...)". [APECS Group Review, Germany]	Accepted - Text modified
20015	4	66	19	66	20	Remove sentence in parenthesis "(including Small Island Developing States)". [APECS Group Review, Germany]	Accepted - Text modified
6475	4	66	24	0		Suggest remove "already" [Nina Hunter, South Africa]	Noted - to be addressed in proof of FGD
9615	4	66	25	66	25	This section could have more detail on the issue of institutionally-caused and/or path-dependent vulnerability, some of which is addressed in later sections. [Government of France, France]	Rejected: Word limits compel shortening of sections and issue addressed under governance challenges (e.g., 4.4.2; 4.4.3.3
19999	4	66	25	69	32	This is a very long box. Some of this may benefit by trimming down detailed explainations of the improvements of vulnerability assessments and moving some of that relevant literature to later in Section 4.3. [APECS Group Review, Germany]	Accepted - Text considerable shorthened
20001	4	66	25	69	32	A potential re-organization of box 4.2. In box 4.2 - 'Projections of future exposure', there is a citation about projections of risk and vulnerability (line 44-47). Re-organizing the box to discuss (a) exposure, (b) vulnerability & risk, and then (c) future exposure, vulnerability, and risk, may create a more logical flow. (Note - a later comment will suggest incorporating content from subsection 4.3.3.2.1 into this one). [APECS Group Review, Germany]	Rejected - the mentioned text part refers to "projecting the evolution of the exposure of socially vulnerable sub-populations" which is different to projection of vulnerability
20017	4	66	28	66	28	Replace "recent advances in methodologies in assessing" by "new methodologies assessing". [APECS Group Review, Germany]	Rejected - methodologies are not neceserily always new. Advances might be due to new or furter developed old methodologies
20019	4	66	29	66	30	"Since the emphasis is on methodological advances, not all references cover a coastal context." Why would you include methods that are not related to coastal context? Is that relevant and applicable in a coastal context? If it hasn't been shown and proven then I would suggest to only keep methodologies that were developped in coastal context. [APECS Group Review, Germany]	Rejected - we only cited methods, which have great relevance at the coast even if these might be developed in a different context
6473	4	66	30	67	1	Suggest replace semi-colons with commas [Nina Hunter, South Africa]	Accpeted- Semicolons were replaced where appropiate
33517	4	66	30	67	1	Add ecosystems and biodiversity to list of affected environment. [Government of United States of America, United States of America]	Rejected - this is a reference here to the SREX definition
20029	4	67	2	67	2	Replace seal lvel rise by SLR. [APECS Group Review, Germany]	Accepted - Text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20023	4	67	2	67	3	Here, vulnerability is defined. Since risk is discussed later in this box (ex//pg 67, line 56 - p. 68, line 2), there should probably be a definition of risk included here, as well as a quick review of how exposure, vulnerability, and hazards interact to produce risk. [APECS Group Review, Germany]	Taken into account - definitions have been removed. Reference to the SREX definitions is provided earlier in the chapter now
20025	4	67	6	67	7	Is "manifestation" the right word? The way I understand AR5's discussion of risk, exposure is a component of, rather than manifestation of, risk. (Hopefully this is not an editorial comment - I believe the distinction is a concept question.) [APECS Group Review, Germany]	This text has been removed (box has been sorthened)
20031	4	67	6	67	7	You say "Many studies deal with". Please add references to these studies. Same in the following sentence: "a smaller number of studies" that means you should refer to more than one study. [APECS Group Review, Germany]	This text has been removed (box has been sorthened)
20027	4	67	11	67	28	Other than census, satellite, and big data, are a few other data sources for exposure assessments. For instance, non-census quantitative surveys (i.e. DHS), and smaller scale qualitative field campaigns. It may be prudent to include these. [APECS Group Review, Germany]	The box has been cut by 50%, thus the suggested additional sources were not included
20033	4	67	12	67	12	Change terminology: "elements" is too vague. Replace "usually" by "mostly" or remove this word. [APECS Group Review, Germany]	Accepted - Text modified
2189	4	67	12	67	28	Worth mentioned increases in DEM quality (e.g., Kulp and Strauss 2016, 2018)? [Robert Kopp, United States of America]	Accepted - Text modified
22517	4	67	12	67	28	Suggest this section or the previous section also mention improved representation of estuarine water levels (Hanslow et al., 2018 https://www.nature.com/articles/s41598-018-25410-y), modelling of erosional impacts using probablistic methods (Kinsela et al., 2017 https://www.mdpi.com/2077-1312/5/4/61) and the integrated assessment of properties and infrastructure exposed to SLR. [Government of Australia, Australia]	Rejected - these paper rather refer to the hazard domain in their main focus
4801	4	67	14	0		"population distribution" would be the predicted variable, not a proxy. Proxies would include geographical features, roads and infrastructure, urban areas, night light etc. that allow one to predict the probable distribution of people within census areas. [Debra Roberts and Durban Team, South Africa]	This text has been removed (box has been sorthened)
22013	4	67	14	67	14	Mobile data is just an example of "big" data...? [David Schoeman, Australia]	Accepted- text was revised
20035	4	67	14	67	16	Change this sentence to "However, new technologies (e.g., drones, mobile data, big data) and more available satellite products provide new tools for exposure analysis." [APECS Group Review, Germany]	Accepted- text was revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20037	4	67	16	67	21	Break this sentence as "Exposure assessment is increasingly based on the combination of high resolution satellite imagery and spatio-temporal population modelling. This is used to understand diurnal differences in flood risk exposure (Smith et al., 2016a), to predict population density at ~100 m spatial resolution (Stevens et al., 2015), or to assess risk exposure for infrastructure (Figueiredo and Martina, 2016)". [APECS Group Review, Germany]	Accepted- text was revised
20039	4	67	18	67	19	Renner et al., 2017 does not refer to coastal areas but mountainuous areas. Remove from the text. [APECS Group Review, Germany]	Rejected - we mention that this was developed in mountain areas but with high relevance for the touristic coastal areas
6477	4	67	25	0		Suggest insert "the" before "case" [Nina Hunter, South Africa]	This text changed due to other editing
6479	4	67	28	0		Replace "touristic" with "tourism", and "highly" with "high" [Nina Hunter, South Africa]	Accepted - Text modified
6481	4	67	31	0		Suggest inserting "have" before "used" [Nina Hunter, South Africa]	This text has been removed (box has been sorthened)
6483	4	67	33	0		Suggest inserting "to" after "due" [Nina Hunter, South Africa]	This text has been removed (box has been sorthened)
20041	4	67	33	67	33	"may change" is too vague. Replace by " are demographically dynamic". [APECS Group Review, Germany]	This text has been removed (box has been sorthened)
20043	4	67	34	67	34	Replace "and assets will change." by "will vary in the future". [APECS Group Review, Germany]	This text has been removed (box has been sorthened)
20045	4	67	35	67	35	Break the sentence in 2: after "but also expected changes in population size (Jongman et al., 2012; Hauer et al., 2016)." Start the new sentence at "It involves different socio-economic scenarios (…)". [APECS Group Review, Germany]	Accepted - Text modified
6485	4	67	38	0		Consider removing "also" and inserting it before "considered" [Nina Hunter, South Africa]	Accepted - Text modified
31201	4	67	43	67	43	Not clear what this confidence statement refers to – the method? [Hans-Otto Poertner and WGII TSU, Germany]	Confidence statement was removed as it doesn't fit to the character of the box
20047	4	67	43	67	44	Replace "As coastal communities may change (e.g. expand over time)" by "As coastal communities may grow". [APECS Group Review, Germany]	Rejected - growth is just one otion of change
6487	4	67	44	0		Suggest replacing "Additionally" with "In addition" [Nina Hunter, South Africa]	This text has been removed (box has been sorthened)
20049	4	67	44	67	44	Generally the text comprises too many times the word "change". You must explain this change. Are these changes positive/negative? Growth or decrease? Etc… As it is now you statements do not bring any scientific information to the reader and can therefore be deleted. Here I suggest you to read some more literature and find out if the exposed population is expected to increase or decrease. This is an important and relevant information for the report. If you can not refer to any study then better remore this statement that is not based on any scientific evidence. [APECS Group Review, Germany]	Rejected - the issue is that exposure and vulnerability assessment used for a long timy static data. The advance is that the changes and dynamics are now increasingly concidered. Population might shrink or grow, get older or younger in avarage, etc. The direction is part of the context and not the methodology

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29929	4	67	47	67	47	define socially vulnerable (and/or include "underserved"); there is additional literature on social vulnerability, e.g. https://link.springer.com/chapter/10.1007/978-3-319-63254-4_10 [Anna Zivian, United States of America]	Socially was deleted
20051	4	67	48	67	48	This reference "(Rao et al., 2017)" is not well placed. Move it to the end of the sentence. [APECS Group Review, Germany]	Accepted - Text modified
20053	4	67	50	67	50	Remove capil letters "Shared Socioeconomic Pathways". You introduce this abbreviation now but then reintroduce it 3 time in the section 4.3, please use only the abbreviation after you introduced it. [APECS Group Review, Germany]	Accepted - Text modified
21825	4	67	53	0		SSP's have also been used to estimate future population in regional coastal-hazard risk exposure studies e.g. Vousdoukas, M. I. et al., 2018 (already referenced) [Robert Bell, New Zealand]	Accepted - Text modified
13139	4	67	53	67	53	Vousdoukas et al. 2018 (Nature Climate Change, https://www.nature.com/articles/s41558-018-0260-4) projected on global scale an increase of one order of magnitude for the population exposed to coastal flooding, and of two-three orders of magnitude for the expected annual damage [Michail Vousdoukas, Italy]	Reference added but numbers not cited here (as the box discusses the methods)
31369	4	67	56	68	8	Please balance this nice text with the risk definition provided in chapter 1, CCB. [Hans-Otto Poertner and WGII TSU, Germany]	Rejected. This subchapter and the box deals with exposure and vulnerability. Risk is discussed thereafter
23207	4	68	0	69		Different style of text with list of points, limited / no use of confidence language, missing conclusions with substance and confidence language. [Valerie Masson-Delmotte, France]	Not fully clear, which part of the text is meant. If this comment addresses the Box on methodological advances, than we agree it has a different style but we feel this fits the topic.
9913	4	68	2	68	8	The comparison between Shanghai-New York, the Nile Delta in Egypt are well developed, but could be better synthetized, in order to safe space. [Úrsula Oswald Spring, Mexico]	Accepted - The text was shorthened considerably
29931	4	68	6	68	8	add acknowledgement of institutional/structural causes of vulnerability as underlying factors that also need to be addressed [Anna Zivian, United States of America]	This text has been removed (box has been sorthened)
20055	4	68	7	68	8	(V) "using new, better data in vulnerability assessments" does not have its own sub-section later but rather is combined with (iv). In the exposure section, there is a sub-section on improved assessements (p.67, lines 11-28) which focuses on better data; what about combining those? [APECS Group Review, Germany]	This text has been removed (box has been sorthened)
9617	4	68	24	68	27	Consider defining "behavioural adaptation dynamics" since "behavioural" can be understood for its meaning in psychology theory and sounds phony in this section. [Government of France, France]	Text revised - behavioure is used

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21827	4	68	27	0		Other approaches that couple these two aspects are (2 Refs): a) use of a Bayesian model REF: Small & Xian (2018). A human-environmental network model for assessing coastal mitigation decisions informed by imperfect climate studies. Global Env. Change. https://doi.org/10.1016/j.gloenvcha.2018.09.006 and b) incorporating barriers to implementation and policy options from elicitation: REF: Lipiec, Ruggiero et al.(2018). Mapping Out Climate Change: Assessing How Coastal Communities Adapt Using Alternative Future Scenarios. Jnl Coastal Research. DOI: 10.2112/JCOASTRES-D-17-00115.1 [Robert Bell, New Zealand]	Rejected, references fits more for decisions than to vulnerability assessments
27063	4	68	29	0		The paragraph that starts at line 29 could be expanded to briefly discuss the challenges of cascading effects: if flooding affects a substation, it could affect hospitals, schools, transportation systems (and other critical infrastructures) outside of the flooded area. Therefore, it is important more cities develop data and models to understand the potential cascading effects that might happen in the case of a flood. (see for example: Serre, Damien, and Charlotte Heinzlef. 2018. Assessing and mapping urban resilience to floods with respect to cascading effects through critical infrastructure networks. International Journal of Disaster Risk Reduction 30 : 235-43.) [Kees Lokman, Canada]	Accepted - text revised
9619	4	68	30	68	34	There might be some words missing for the sentence is hardly understandable. [Government of France, France]	Accepted - text revised
1501	4	68	34	0		Rephrasing needed as keyword to highlight concept missing [Chandani APPADOO, Mauritius]	Accepted - text revised
6489	4	68	34	0		Remove "that of the" [Nina Hunter, South Africa]	Accepted - text revised
20057	4	68	34	68	34	Part of the sentence is missing "the that of the population". [APECS Group Review, Germany]	Accepted - text revised
20059	4	68	36	68	43	Break this sentence into several ones so that is is easier to understand what you want to convey. [APECS Group Review, Germany]	Accepted - text revised
6491	4	68	40	0		Remove "a" [Nina Hunter, South Africa]	Accepted - text revised
20061	4	68	43	68	44	"Hotspot" is not the right terminology here. Use "Areas" or "Places". [APECS Group Review, Germany]	Accepted - text revised
20063	4	68	46	68	47	"but socio-economic factors still tend to dominate these assessments": this part of the sentence needs to be clarified. Do you want to say that there is a lack of social-ecological assessment studies in comparision to socio-economic ones? [APECS Group Review, Germany]	This text has been removed (box has been sorthened)
20071	4	69	1	69	2	Is this statement "Also, vulnerability indicators (...)" a conclusion from the framework developped by Liu et al. 2016a? If yes, please mention it. [APECS Group Review, Germany]	No, it is not. Text was revised for clarity.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22015	4	69	9	69	9	This sentence implies that "vulnerability funcitons" are nonlinear, but linearity can be expressed simply as a "function", also. Maybe this term exists in the literature, but it seems noninutitive and should perhaps be fixed? [David Schoeman, Australia]	This text has been removed (box has been sorthened)
21829	4	69	11	0		An example for physical damage using vulnerability functions is that from tsunamis - but could also add in a more relevant Ref of using vulnerability functions for coastal surge and wave hazards: Ref: Hatzikyriakou and Lin (2017). Simulating storm surge waves for structural vulnerability estimation and flood hazard mapping. Natural Hazards. DOI 10.1007/s11069-017-3001-5 [Robert Bell, New Zealand]	Accepted - text revised
20065	4	69	15	69	17	I suggest this sentence be re-written and perhaps expanded. At risk of this being an editorial comment, there is a lot of rich information provided here and I had to read it multiple times to understand it. It may benefit through the addition of definitions or clarifications, or even dividing it into two sentences with their own examples. [APECS Group Review, Germany]	Accepted - text revised
13979	4	69	15	69	18	There are a number of technical terms within this sentence which results in the meaning being lost. This sentence could usefully be re-worded to briefly explain 'outranking procedures' and the different threshold concepts listed. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text revised
6493	4	69	18	0		Suggest replace "similarly" with "similar" [Nina Hunter, South Africa]	Accepted - text revised
31203	4	69	24	69	30	This summary can be cut. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - text revised
20067	4	69	37	71	48	Within this section, there is a long discussion on coastal ecosystems (4.3.2.1.1) but a very short one on the human dimensions (4.3.2.1.2). Given that this section's purpose is to review the past key insights from the last report, I would suggest shrinking section 4.3.2.1.1 to be closer to 4.3.2.1.2 (and perhaps lengthening the human dimensions section somewhat). This would allow the reader to get to the new information quicker. [APECS Group Review, Germany]	Text parts have been heavily revised
20069	4	69	37	71	48	This greater section (4.3.2.1) includes multiple studies which were published after the SREX and AR5. If it is the intention to use this section to emphasize new knowledge since SREX & AR5, the title for this section should be edited to reflect that. If not, then I suggest moving the newer literature to later sections. [APECS Group Review, Germany]	taken into account - title was deleted

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9621	4	69	40	69	42	Clarify that “ecosystems” as used in this section refers to natural ecosystems; the term “ecosystem” is often used in a way that encompasses human communities, but this section is not intended to address that. [Government of France, France]	taken into account - The word "natural" was added
3653	4	69	42	69	42	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	take into account - text was revised
20073	4	69	44	69	45	Remove the part of the sentence "(...) and impacts (e.g., pollution" since the vulnerability can't depend on an impact. [APECS Group Review, Germany]	take into account - text was revised
4803	4	70	16	0		Interesting question re "'coastal squeeze": presumably this is mainly an issue in built-up areas. What proportion of the global (habitable) coastline is built up? Is this mentioned somewhere? And how are they distributed? [Debra Roberts and Durban Team, South Africa]	Noted: Available evidence on coastal squeeze is assessed in 4.3.2.3
8541	4	70	20	0		Section/chapter needs reference to Schuerch M, Spencer T, Temmerman S, Kirwan ML, Wolff C, Lincke D, McOwen CJ, Pickering MD, Reef R, Vafeidis AT, Hinkel J, Nicholls RJ, Brown S 2018 Future response of global coastal wetlands to sea-level rise. Nature 561: 231-234 [doi: https://doi.org/10.1038/s41586-018-0476-5] and related papers by S Temmerman and ML Kirwan [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Accepted
27227	4	70	21	70	31	The mentioning of coral and/or coral bleaching seems to be missing from this paragaph as it is an apt topic to explore here. [Michael Schwebel, United States of America]	Noted. Coral bleaching is not realted to sea level rise thus not discussed here. It is addressed in Chapter 5
8543	4	70	23	70	23	But temperature rises might aid mangrove expansion near frost-controlled limits. Similarly sea level rise might allow renewed vertical coral growth on reef flats currently constrained by low tide exposure. Environmental change generates opportunities which are not necessarily always negative. [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Noted. We assessed available post-AR5 literature
20077	4	70	27	70	27	Hernan et al, 2017, also not included in reference list. [APECS Group Review, Germany]	Rejected. It was included in the reference list. Page 148,18 and remained in the new draft.
31205	4	70	36	70	38	The confidence statement should ideally be backed by more references and case studies. [Hans-Otto Poertner and WGII TSU, Germany]	Noted: we assessed available post-AR5 literature; and kept within word limits for this section
20075	4	70	38	70	38	The reference is not included in the reference list. [APECS Group Review, Germany]	Rejected. It was included in the reference list. Page 169,57 and remained in the new draft.
4805	4	70	44	0		What are examples of "synergisms among stressors"? Likewise, of "antagonisms and other feedbacks" (next line)? [Debra Roberts and Durban Team, South Africa]	Rejected. The terms synergism and antagonism are used as per their plain language meaning. To avoid excessive word count, we avoided adding examples and rely on the cited references for those needing further detail.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11675	4	70	56	71	10	The india-pacific mangrove region should be include in the areas at risk where SLR> sediment accretion."We find that sediment availability can enable mangrove forests to maintain rates of soil-surface elevation gain that match or exceed that of sea-level rise, but for 69 per cent of our study sites the current rate of sea-level rise exceeded the soil surface elevation gain." Lovelock CE, Cahoon DR, Friess DA, Guntenspergen GR, Krauss KW, Reef R, et al. The vulnerability of Indo-Pacific mangrove forests to sea-level rise. Nature 2015; 526: 559. [Pierre Taillardat, Canada]	Accepted
13981	4	71	1	71	2	Further work undertaken by Emile-Geay et al 2016, Chen et al 2016 and Carre et al 2014 indicates substantial reduction in El Nino variability between ca,. 5000-3000 cal yr BP - this work refutes conclusions made by Cobb et al 2013 which stated no significant change in ENSO variability over the Holocene. Please make clear that more recent work has indicated that ENSO variability has been significant throughout the Holocene and consider removing line that there is no evidence for a systematic trend in ENSO variance. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	This comment appears inconsistent with relevant section in SOD
10351	4	71	12	71	17	What are you doing to make the study approaches are more holistic? [Mahmood Riyaz, Maldives]	It is not clear what is meant by this comment.
20079	4	71	39	71	40	This is a bold claim given that it includes citations up to 2017. There are studies (at least in the US) studying vulnerability to SLR. While some of course look at extreme events (i.e. hurricanes), others focus on slow-onset events related to SLR (ex// nuisance flooding, land loss). Given that the paragraph this sentence belongs to is still within the greater section of "Key Insights from the IPCC's…", and that it includes more recent publications, perhaps this should be edited to not include those citations and keep the claim of something that may have been more true in ~2014. [APECS Group Review, Germany]	Accepted - Relevant comment. We modified the title of this sub-section (and also the two previous ones) to make it clear that here we discuss the insights from the literature until the publication of the AR5. So here, we highlight the point of departure for our report, and new literature since then is described in the following sub-sections. N.B.: The 2017 studies that is used to support the idea there are still some difficulty, for society to fully comprehend and science to fully analyse long-term gradual changes like SLR.
29933	4	71	45	71	45	reference should be to 4.3.2.5; there is no 4.3.2.6 [Anna Zivian, United States of America]	Accepted - Text modified
9623	4	71	45	71	48	Referenced section should be 4.3.2.5 (Synthetic understanding of the drivers of exposure and vulnerability); there is no 4.3.2.6. [Government of France, France]	Accepted - Text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4809	4	71	50	0		Related to previous comments on populations exposed to coastal flooding, it would be useful if there was a way to show on a map (1) coastal areas at risk of coastal flooding, based on a combination of SLR, wave height, extreme events and storm surge and even compound flooding in river mouths, and then (2) the populations living within this vulnerable zone. How could one represent this graphically? Possibly a full page global spread, with a thick, colour-coded coastline where the colour represents the height above sea level that is vulnerable (in some areas this will be 5m, in others 20m or more perhaps? - is this information available? need not be continuous, can be categorical). And then show a symbol in each non-landlocked country, where the size of the symbol represents the number of people who live in that vulnerable zone (possibly colour-coded so the colour represents the proportion of the total country's population living at risk - from very low to near 100%). Possibly a second symbol where the size represents the proportion of the land area for that country that is in the vulnerable zone (for some countries this will be very small, but for some it will be considerable, even 100% for some island states). And perhaps the colour could represent the proportion of the vulnerable area that is built-up / urban. Island-rich areas could be blown out. Just an idea. As for which scenario to use - the 'business as usual' for 2100 would be very informative? Section 4.3.3.2 seems to cover what is available currently. [Debra Roberts and Durban Team, South Africa]	Flooding (observed and projected) is discussed in sections 4.3.3.2 and 4.4.2. However, here we decided to not go for a global map showing both flood risk and population living in LECZ (Low Elevated Coastal Zones). One main reason is the lack of reliable, local scale data for a very refined (i.e. very local) description of the risk of flooding. For example, while some studies exist that properly include the role of local features (geomorphology, bathymetry, topography, type of land cover, density in vegetation, building and infrastructure density, etc.) in flooding patterns and extent, we are far from a satisfying global coverage and hence from a fully reliable global dataset. In addition, developing a global map at a refined scale would make such a display item very busy (even if it takes a full page); see for example Figure 1 in the Integrative Cross-Chapter Box on Low-Lying islands and coasts: only elevation data are represented, and it already looks difficult to add flooding and population data. A way to proceed would have been to describe some local level case studies, but the authors team faced two constrains on the road to the Final Draft: limited time and need for already shortening the SOD version.
20081	4	71	52	72	29	This broader section is about recent settlement patterns and movements; however, there are some articles which discuss settlements that may not be as recent (i.e. Kumar and Taylor, 2015). Something this section does not explicitely consider is why certain communities settle in coastal areas. For example, living near the coast is essential for livelihoods which revolve around fisheries and aquaculture, or for certain cultural groups with traditional connections to coast. Discussing where people are already settled, or currently settling, without the context of why they are there, may indicate the possiblity of adaptation by moving people away from coastal areas without an explicit look at community needs. [APECS Group Review, Germany]	The authors well received this comment and acknowledge that there is some literature describing settlement patterns on a longer timescale than onlty the recent decades to century (especially in the Pacific Islands, with a multi-century scale). However, moving in-depth into the root causes of this century settlement patterns (e.g. role of Western colonization on island settlements) looks to us beyond the scope of this report, or at least impossible to cover properly in the very limited space allocated to this issue in this chapter and this report as a whole. In addition, still few papers addressing the multi-centenal roots of observed trends discuss the benefits and limitations of better understanding the past to help address current problems; yet, dealing with this issue (understand the past to inform the future) require caution. Again, that's out of the scope of this report.
6495	4	71	54	0		Replace "an" with "a" [Nina Hunter, South Africa]	Accepted - Text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
24085	4	71	54	71	54	"an rural exodus" or "a rural exodus"? [Sylvain Ouillon, France]	Accepted - Text modified
22017	4	71	56	71	56	What is a "megatrend" and how does it differ from a common or garden trend? [David Schoeman, Australia]	Accepted - Text modified to avoid using the term "megatrend" that is indeed defined neither in the chapter nor in the SROCC glossary.
29935	4	71	56	72	29	"megatrend" is jargony and ill-defined; just say "trend" here and elsewhere in this section [Anna Zivian, United States of America]	Accepted - Text modified to avoid using the term "megatrend" that is indeed defined neither in the chapter nor in the SROCC glossary.
20091	4	72	3	72	3	Replace "just to mention few" by "example list not exhaustive". [APECS Group Review, Germany]	Accepted - Text modified
13985	4	72	9	72	9	The first sentence of the paragraph states 'This translates at the regional and local scales', however it is not clear what translates, please clarify. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - Sub-section completely restructured: the first sentence is not anymore the start of a new paragraph, but has been included in the originally fisrt paragraph. We hope this helps better understand the flow of the demonstration.
13983	4	72	9	72	12	Suggest adding addtional detail to explain statement 'areas such as South Florida and the wider Caribbean, however, mangroves cannot outpace current SLR rates and are at risk of disappearing'. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Rejected_On the road to the Final Draft, the author team decided to avoid, as much as possible, adding new material, mainly due to a lack of space and a critical need for shortening the Second Order Draft version of chapter (from 89 to 50 pages).
16381	4	72	9	72	12	Caribbean Islands fraction of Latin America is low. Consider separating Caribbean from Latin America. Please see also: Lam, N. S. N., Arenas, H., Brito, P. L., & Liu, K. B. (2014). Assessment of vulnerability and adaptive capacity to coastal hazards in the Caribbean Region. Journal of Coastal Research, 70(sp1), 473-478. AND Neumann, B., Vafeidis, A. T., Zimmermann, J., & Nicholls, R. J. (2015). Future coastal population growth and exposure to sea-level rise and coastal flooding-a global assessment. PloS one, 10(3), e0118571. [Alexander Nauels, Germany]	Accepted - Text modified. In addition, we limited the addition of new references to the most recent ones, and so did not included Lam et al (2014). Neumann et al (2015) is already included in this sub-section.
28463	4	72	9	72	12	It may be helpful here to separate Caribbean islands from Latin America. Small islands are recognized as particulalry vulnerable with high percentages of their population in low elevation coastal zone. The high percentages of Caribbean small island populations is masked by including them along with Latin America. Please see also: Lam, N. S. N., Arenas, H., Brito, P. L., & Liu, K. B. (2014). Assessment of vulnerability and adaptive capacity to coastal hazards in the Caribbean Region. Journal of Coastal Research, 70(sp1), 473-478. AND Neumann, B., Vafeidis, A. T., Zimmermann, J., & Nicholls, R. J. (2015). Future coastal population growth and exposure to sea-level rise and coastal flooding-a global assessment. PloS one, 10(3), e0118571. [Government of Saint Lucia, Saint Lucia]	Accepted - Text modified (with a special mention for islands). In addition, we limited the addition of new references to the most recent ones, and so did not included Lam et al (2014). Neumann et al (2015) is already included in this sub-section.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22019	4	72	9	72	29	Again, a strange way to sart a paragraph? The rest of the paragraph seems unnecessarily long, and could likely be shortened by half without losing much information content. Finally, is there really a need for the quote? [David Schoeman, Australia]	Accepted - Sub-section completely restructured: "strange start" has disappeared + the quote has been moved up to imrpve the flow of ideas.
28465	4	72	12	72	29	There are similar challenges for Caribbean SIDS which should be included here. Please see: Mycoo, M. A. (2018). Beyond 1.5 C: vulnerabilities and adaptation strategies for Caribbean Small Island developing states. Regional Environmental Change, 18(8), 2341-2353. [Government of Saint Lucia, Saint Lucia]	Accepted - Text modified to emphasize the situation of caribeen ialnds + Reference included.
6497	4	72	14	0		Replace "constrains" with "constraints" [Nina Hunter, South Africa]	Accepted - Text modified
4807	4	72	18	0		What are "freshwater lenses"? [Debra Roberts and Durban Team, South Africa]	Accepted - Text modified ('lenses" replaced by "resources")
20083	4	72	21	72	24	Reorganization suggestion: move this citation about indigenous people before the discussion about atoll countries on p.72 line 18. This citation about indigenous people is true in many coastal geographical contexts, not just in island countries. [APECS Group Review, Germany]	Accepted - Paragraph reshaped
25685	4	72	21	72	25	coastal settlement patterns are also driven by preferential investments in transportation (port led development) energy and industry sectors and this could be included [Government of India, India]	Accepted - Included in the previous paragraph
6499	4	72	27	0		Should the reference for the direct quote not be listed first followed by other references? Please apply to all references in the chapter. [Nina Hunter, South Africa]	Accepted_For final editing
31207	4	72	31	0		The title could be changed to better reflect that this section deals with deltas and coastal squeeze. [Hans-Otto Poertner and WGII TSU, Germany]	Noted. We have kept the original title, and modified text, to reference the wider-scale land-sea interactions shaping coastal exposure and vulnerability.
20093	4	72	31	72	31	I suggest to just use "Sea and Terrestrial processes" remove the "-Born". [APECS Group Review, Germany]	Noted and taken into account in revisions.
22021	4	72	31	72	31	Why "Sea-Born" and not "Marine", if "Terrestrial" is the complement? [David Schoeman, Australia]	Noted and taken into account in revisions.
20085	4	72	31	74	21	Structural & organizational suggestion: This section is quite long, especially compared to the others. A suggestion is to shorten it and/or add some sub-headings to organize thoughts (for example, discussions of reduced sedimentation occur in several different paragraphs). Also, perhaps consider moving this section before section 4.3.2.2 (settlement trends) - this would introduce the bio/geophysical propertieis shaping vulnerability and exposure, where the other subsections (4.3.2.2 and 4.3.2.4) are about human changes. [APECS Group Review, Germany]	Noted - the length of sections was carefully considered after feedback on the SOD and cut-backs made in the light of key post-AR5 literature assessed.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20089	4	72	31	74	21	I would also suggest adding a brief discussion of other human activities which affect exposure of ecosystems, such as those which increase erosion (ex//dredging) or cause subsidence (hydrocarbon extraction) (i.e. in coastal Louisiana). Potential citation: Couvillion, B. R., Beck, H., Schoolmaster, D., & Fischer, M. (2017). Land Area Change in Coastal Louisiana (1932 to 2016). U.S. Geological Survey. https://doi.org/10.3133/sim3381. [APECS Group Review, Germany]	Taken into account - the impact of human activities on exposure of coastal ecosystems is covered in 4.3.2.1 - with examples chosen to reflect global experience.
20087	4	72	38	72	56	This section provides many examples of changes in sedimentation from one area of the world (Southeastern Asia). It could be fruitful to spread out examples to have more geographic and demographic/political coverage. For example, as briefly mentioned in the next paragraph, the damming of the Mississippi has led to signficant land loss. [APECS Group Review, Germany]	Noted - the section as a whole covers a variety of coastal settings and drivers of coastal exposure and vulnerability.
20095	4	72	39	72	39	Use "catchments" in plural form. [APECS Group Review, Germany]	Noted - to be addressed in proof of FGD
24087	4	72	43	72	43	"high confidence, high agreement" in italics [Sylvain Ouillon, France]	To be taken into account in final copy editing
6501	4	72	54	0		Insert fullstop after "deltas" [Nina Hunter, South Africa]	To be taken into account in final copy editing
24089	4	72	54	72	54	suggestion to add parenthesis, giving: Dunn et al. (2018) [Sylvain Ouillon, France]	To be taken into account in final copy editing
20097	4	73	1	73	2	The role of tropical cyclone climatology in sediment changes seems somewhat out of place, as it has only a brief discussion. It could also benefit from the includsion of confidence language (low confidence?). [APECS Group Review, Germany]	Noted - it was judged useful to highlight this finding; without providing a confidence statement on this particular aspect.
20099	4	73	3	73	3	Remove "again" and "More generally". [APECS Group Review, Germany]	To be taken into account in final copy editing
20101	4	73	4	73	4	Change to "(…) disrupt delta's natural mechanisms". [APECS Group Review, Germany]	To be taken into account in final copy editing
6503	4	73	13	0		Change "sediments is depositing" to "sediment is deposited"; remove "that" [Nina Hunter, South Africa]	To be taken into account in final copy editing
20103	4	73	13	73	13	Change to "deposited" and remove "that". [APECS Group Review, Germany]	To be taken into account in final copy editing
24091	4	73	13	73	13	"and that a large part", please remove "that" [Sylvain Ouillon, France]	Accepted
25665	4	73	16	73	18	Incomplete sentence: "Enhanced sedimentation further upstream in estuaries and a silting-up of estuarine navigation channels can have high economic consequences for cities with a large estuarine harbour will be." Probably the last few words in the line need to be modified to say "with large estuarine harbours. [Government of India, India]	Accepted - sentence completed
6505	4	73	18	0		Remove "will be" [Nina Hunter, South Africa]	Accepted
20105	4	73	18	73	18	Remove "will be" at the end of the sentence. [APECS Group Review, Germany]	Accepted
20107	4	73	18	73	18	Add "For example" before the sentence starts "In Haiphong City (…)". [APECS Group Review, Germany]	To be taken into account in final copy editing
24093	4	73	18	73	18	"estuarine harbour will be". Please remove "will be" [Sylvain Ouillon, France]	Accepted
33519	4	73	18	73	18	Grammar issue. [Government of United States of America, United States of America]	Accepted
6507	4	73	29	73	35	Change "shorline" to "shoreline" [Nina Hunter, South Africa]	Accepted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
24095	4	73	31	73	31	"Mozambique" [Sylvain Ouillon, France]	Accepted
8545	4	73	31	73	33	This is only over the period of the Landsat archive. The time period for these statistics needs to be reported. [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Accepted
24097	4	73	35	73	35	"Shoreline" [Sylvain Ouillon, France]	Accepted
21831	4	73	35	74	6	Another aspect not covered in the coastal squeeze discourse is the reverse sensitivity of coastal porotection (eg. Seawalls) for adaptation in estuaries. Recent literature has highlighted that the presence of hard protection measures can increase the tide range (and therefore exacrebate the adaptation deficit) - compared to the situation where permanent inundation of low-lying margins is allowed to occur e.g. REF: Lee et al. (2017). Impact of sea level rise on tidal range in Chesapeake and Delaware Bays. JGR-Oceans. doi:10.1002/2016JC012597 [Robert Bell, New Zealand]	Noted and taken into account in 4.4.2.2.5
6509	4	73	40	0		Remove additional "and" [Nina Hunter, South Africa]	Accepted
6511	4	73	49	0		Remove "be" [Nina Hunter, South Africa]	Accepted
24099	4	73	49	73	49	please check "will be become" [Sylvain Ouillon, France]	Resolved
13987	4	73	51	74	6	Studies have suggested that habitat development on managed realignment sites does not recreate the same species diversity as a natural coastal environment (even some years after realignment). This is worth considering where adaptation might consider managed realignment and its ecosystem value. Natural England have produced research on this. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted - this matter is addressed in the context of the effectiveness of ecosystem based adaptation (4.4.2.2.5)
6513	4	73	52	0		Remove "are" [Nina Hunter, South Africa]	To be taken into account in final copy editing
20109	4	74	1	74	1	Break the sentence after "(...) (Mills et al., 2016)". [APECS Group Review, Germany]	To be taken into account in final copy editing
10353	4	74	8	74	21	Adress the specific case of low lying small islands in this context [Mahmood Riyaz, Maldives]	Noted - it was not judged appropriate to single out low-lying small islands given the general application of these findings.
31209	4	74	11	74	12	This statement does not seem to be based on this section's assessment. The line-of-sight is unclear. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - removed from FGD
29937	4	74	18	74	21	discussion of systemic/structural vulnerability is missing [Anna Zivian, United States of America]	Noted - this matter is addressed in the following section on other human dimensions in the FGD (4.3.2.4)
6515	4	74	21	0		Suggest removing "in the case" - not necessary [Nina Hunter, South Africa]	Accepted- and revised accordingly.
9625	4	74	23	74	23	Add discussion of systemic vulnerability/institutionally-driven vulnerability here. [Government of France, France]	Accepted - This point has not been specifically developed in this sub-section due to the imperative need to shorten the Second Order Draft version of chapter from 89 to 50 pages. However, these institutionnal aspects are discussed in section 4.4, and a synthetic perspectoive on vulnerability is developed in the Integrative Cross-Chapter Box on "Low-Lying Islands and Coasts".
6517	4	74	36	0		Suggest removing "a" [Nina Hunter, South Africa]	Accepted
9627	4	74	51	74	53	The statement is true about every environmental changes, not just gradual ones. [Government of France, France]	Correct, but here we insist on gradual changes to reflect, as much as possible, the SLR-specific nature of the chapter.
6519	4	74	53	0		Change "soils" to singular [Nina Hunter, South Africa]	Accepted

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
23209	4	75	0	75		This is a very long paragraph. Conclusion? [Valerie Masson-Delmotte, France]	The structure of this sub-section has been revised and made tigther. It now better highlights the key message (stated in the second sentence) that the loss of IK and LK is now well documented as a source of increased vulnerability to environmental changes and hazards, and therefore "may increase long-term vulnerability to SLR (medium evidence, high agreement)" (sub-section 4.3.2.4.2, now paragraph 3)
32583	4	75	0	109		In whole text dealing with migration I miss any information about difference between slow/fast onset environmental changes and their impacts on time of population displacement. People affected by any fast environmental change are coming back relatively quickly and in majority. Slow-onset change usually produces bigger migration flows. Their environment is slowly destroyed and it is up to people when they will move and it is long term or permanent migration. This is the key question for decision about adaptation measures. [Robert Stojanov, Czech Republic]	Rejected - The authors understood this comment rather refers to section 4.4.3.5 that deals with "Retreat" issues.
4811	4	75	1	0		Seems this section it weighted mostly to IK.LK is a largefactor in local climate change related decision making. What probably needs to be assessed here is literature on decision making by local governments and municipalities, business, industry, engineering, farmers, etc based on local knowledge... the recognition that local knowledge has an important role to play in global issues, because what local people know works in one place may help people in other places, eg important experience with rainwater harvesting, ecosystem restoration, urban food production, water recycling etc. What matters is the documentation and spread of good and helpful ideas in general. Whether this can be adequately addressed in one small sub-sub-section is doubtful. But at least this section should point towards a greater body of literature (or the lack thereof). [Debra Roberts and Durban Team, South Africa]	Sub-section 4.3.2.4.2 only focuses on the role played by the loss of IK&LK in coastal communities' vulnerability to SLR-related hazards and risks; it doesn't deal with how IK&LK can support robust decision-making and experience sharing among vulnerable people/sectors/territories. These aspects are partly reflected in section 4.4 through the Community-Based Adaptation issue.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9629	4	75	1	75	1	There is no discussion here of the role of LK and IK in providing information beyond local and community-relevant information, but both IK and LK can be important in providing and augmenting scientific knowledge of both past and current changes, for example https://onlinelibrary.wiley.com/doi/full/10.1002/wcc.374, https://link.springer.com/article/10.1007/s10113-017-1125-5, https://www.sciencedirect.com/science/article/pii/S1877343517300039 as examples of literature discussing how IK and LK are important in a broader context of relevant information. [Government of France, France]	Rejected - This comment refers to the role of IK & LK in advancing knowledge on climate change-induced processes, hazards and impacts; which is out of the scope of this sub-section. This specific sub-section onfy focuses on the contribution of the loss IK & LK to communities' vulnerability to SLR. These references have however been shared with other SROCC authors (e.g. fin chapter 1 that deals with IK-LK), as well as the WG2 AR6 authors developing a cross-chapter reflection on IK & LK.
21833	4	75	1	75	49	Indigenous knowledge and its conflicting values for New Zealand's Māori people who dwell in coastal areas is summarised in : REF: Rouse et al. (2016). Coastal adaptation to climate change in Aotearoa-New Zealand. NZ Journal of Marine & Freshwater Research. http://dx.doi.org/10.1080/00288330.2016.1185736 [Robert Bell, New Zealand]	Rejected - This reference has rather been introduced in section 4.3.3.6.4 on "Social values".
29939	4	75	1	75	49	acknowledgement here of role of IK and LK in providing information beyond locally relevant or community relevant information; i.e. contributing to the broader scientific literature (this acknowledgement is noted in other sections) [Anna Zivian, United States of America]	Rejected - This comment refers to the role of IK & LK in advancing knowledge on climate change-induced processes, hazards and impacts; which is out of the scope of this specific sub-section. This sub-section onfy focuses on the contribution of the loss IK & LK to communities' vulnerability to SLR. These references have however been shared with other SROCC authors (e.g. fin chapter 1 that deals with IK-LK), as well as the WG2 AR6 authors developing a cross-chapter reflection on IK & LK.
31211	4	75	2	75	4	Please provide a reference for this; in which AR5 chapters did you find this contradiction? Could also cut this sentence, since it is not SLR-specific. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - Sentence reshaped to shorten the text
28467	4	75	2	75	49	Traditional knowledge also plays a role in Caribbean SIDS. Please see: Beckford, C. (2018). Climate change resiliency in Caribbean SIDS: building greater synergies between science and local and traditional knowledge. Journal of Environmental Studies and Sciences, 8(1), 42-50. AND Mercer, J., Kelman, I., Alfthan, B., & Kurvits, T. (2012). Ecosystem-based adaptation to climate change in Caribbean small island developing states: integrating local and external knowledge. Sustainability, 4(8), 1908-1932. [Government of Saint Lucia, Saint Lucia]	Rejected - These papers have not been included because they deal with the role of IK & LK in advancing knowledge on climate change-induced processes, hazards and impacts; which is out of the scope of this specific sub-section. This sub-section onfy focuses on the contribution of the loss IK & LK to communities' vulnerability to SLR. These references have however been shared with other SROCC authors (e.g. fin chapter 1 that deals with IK-LK), as well as the WG2 AR6 authors developing a cross-chapter reflection on IK & LK.
6521	4	75	8	0		Change "reduce" to "reducing" [Nina Hunter, South Africa]	Accepted - text modified
6523	4	75	12	0		Change "aiming" to "aimed" and change "resources" to "resource" [Nina Hunter, South Africa]	Accepted - text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6525	4	75	13	0		Change "ecosystems" to "ecosystem" and remove "at" [Nina Hunter, South Africa]	Accepted - text modified
6527	4	75	14	0		Change "relationships" to "relationship" and remove "at" [Nina Hunter, South Africa]	Accepted - text modified
6529	4	75	24	0		Change "resources" to "resource" [Nina Hunter, South Africa]	Accepted - text modified
20111	4	75	24	75	28	It can also help when choosing permenant resettlement/migration due to land loss (ex// Isle de Jean Charles). Potential citation: Julie Koppel Maldonado (2015). Chapter 12 - Everyday Practices and Symbolic Forms of Resistance: Adapting to Environmental Change in Coastal Louisiana. In: Hazards, Risks and Disasters in Society, Pages 199-216. [APECS Group Review, Germany]	Rejected - This interesting reference has rather been introduced in section 4.3.3.6.4 on "Social values".
32575	4	75	27	75	28	Could you describe what do you mean using this term “supporting sustainable internal migration” in the context of response to SLR? When the internal migration is not sustainable? It is not clear from the text. [Robert Stojanov, Czech Republic]	Accepted - texet modified (we removed the word "sustainable" as it was indeed useless).
6531	4	75	28	0		Suggest change "spotlight" to "highlight" [Nina Hunter, South Africa]	Accepted - text modified
6533	4	75	36	0		Suggest change "to" to "on" [Nina Hunter, South Africa]	Accepted - text modified
25669	4	75	37	75	37	Similarly, the increased availability of electronic devices such as GPS and fish finders overrides retention of traditional knowledge in identifying locations where fish are available resutling in higher vulnerability at sea when such devices fail [Government of India, India]	Rejected _This deos not directly refer to vulnerability to sea level rise, but rather to vulnerability to ocean change at large (e.g. to fish stocks latitudinal shifts).
20113	4	75	47	75	49	There is very little discussion of LK in this section (mostly IK); an expansion on LK? [APECS Group Review, Germany]	Rejected - Although we acknowledge that this sub-section mainly highlights LK examples, we also face at this stage the imperative need to shorten the Second Order Draft version of the text by 43%, therefore preventig us for adding new material.
4813	4	75	51	0		"Social capital" - many definitions (https://www.socialcapitalresearch.com/literature/definition/). One paragraph is hardly enough to do this topic justice. The role of social media in climate action is at least worth a mention? Again, a major field with relevance for climate change, especially now that action and solutions are coming to the fore. It is probably time for a "special report on society and climate change" - by social scientists. [Debra Roberts and Durban Team, South Africa]	That is a fair comment: "one paragraph is hardly enough to do this topic justice". We however think important to mention this topic in this chapter, first because to date it has not been satisfyingly included in IPCC reports, second to indeed raise attention for future research. "Social media" as influential drivers of social capital are now mentioned in the text.
31213	4	75	51	0		Please include the fndings by: Aldrich, D. P., 2017: The Importance of Social Capital in Building Community Resilience. In: Rethinking Resilience, Adaptation and Transformation in a Time of Change [Yan, W. and W. Galloway (eds.)]. Springer International Publishing, Cham, 357-364. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - Interesting reference using multiple coastal cases; now included in the sub-section.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9631	4	75	51	75	51	Acknowledge criticism of use of the term “social capital,” e.g., https://books.google.com/books?hl=en&lr=&id=nvivgiFfPr0C&oi=fnd&pg=PR7&dq=critique+social+capital&ots=b8TBypV71b&sig=OhqNPBEs0Vze0FAocPQYza8X4gM#v=onepage&q=critique%20social%20capital&f=false [Government of France, France]	Accepted - A reference had been included on this issue (Meyer 2017). Note that the link provided in this comment doesn't work and so the source couldn't be tracked.
29941	4	75	51	76	12	acknowledge critiques of the concept of social capital, e.g., https://link.springer.com/chapter/10.1007/978-3-319-63254-4_10 [Anna Zivian, United States of America]	Accepted - Reference included (Meyer 2017).
6535	4	76	6	0		Change "mangroves replanting" to "replanting mangroves" and "little applied" to "infrequently applied" [Nina Hunter, South Africa]	Accepted - text modified
31371	4	76	10	0	11	Isn’t that a different wording for limits to adaptation which would also undermine social capital. It seems this section is somewhat too focused on the wording. [Hans-Otto Poertner and WGII TSU, Germany]	The authors are not sure they well understood this comment. However, reading again the paragraph, they considered this last sentence useless and decided to remove it.
31373	4	76	14	0		Some of these are important basic considerations that are cross-cutting across chapters and should possibly be part of the CCB on risk in chapter 1. Has an effort been made to avoid redundancy between chapters? [Hans-Otto Poertner and WGII TSU, Germany]	Taken into consideration - This sub-section has been substantially shorten due to the need for chapter 4 to reduce its overall length by 48% (compared to the Second Order Draft version). All general sentences not directly related to SLR-related issues have been removed. In addition, based on a discussion with the leading author of the CCB Risk, it has been decided to not go further on this issue (e.g. schematically, by taking the removed parts of this sub-section and put them into the Risk CCB), also mainly due to space constrains.
9915	4	76	14	76	54	Risk perception changes in different social and geographical regions. In Latin America, where violence is high, risk perception is lower to hazards and people, whenever exposed to loss of life and patrimony, however do again prioritize their fear to socioeconomic calamities and physical violence, while underestimate their socio-environmental threats to hazards. [Úrsula Oswald Spring, Mexico]	Rejected - Thanks for this interesting comment showing that perception of climate-related hazards is relative to the whole risk context. We however cannot consider this comment in the main text because no supporting reference is provided, and also due to the imperative of reducing the overall length of the chapter by 48% (compared to the Second Order Draft version; that prevented added new material).
16383	4	76	15	76	54	Risk perceptions are context specific. Please see Journal of Environmental Studies and Sciences March 2018 issue for 7 papers that address these issues in the small island context [Alexander Nauels, Germany]	Accepted - Especially, a caribbean perspective is now also mentionned
24101	4	76	16	76	16	The storm surge of Xynthia was also underestimated by official forecast (Bertin et al., 2012). Ref: Bertin, X., Bruneau, N., Breilh, J.-F., Fortunato, A.B., Karpytchev, M. Importance of wave age and resonance in storm surges: The case Xynthia, Bay of (2012) Ocean Modelling, 42, 16-30. [Sylvain Ouillon, France]	Accepted - The reference has not been included as it doesn't refer directly to the loss in risk perception by residents (rather refer to monitoring, measure and forecasting issues). However, the sentence has been completely modified, so that the specific drivers initially mentioned do not appear anymore (and so, indirectly, no omission of the point raised by the reviewer).
6537	4	76	16	76	17	"slow onset" repeated? [Nina Hunter, South Africa]	Accepted - text modified
9633	4	76	16	76	17	Replace "slow onset and/or slow onset" by "sudden onset and/or slow onset" [Government of France, France]	Accepted - text modified

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31375	4	76	25	0	27	It seems this needs disentangling for clarity and addressing the question of “how to adapt”. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - Sentence removed as actually useless for the overall argumentation in the paragraph.
25671	4	76	33	76	33	Distance to sea as well as the distance to which tidal effects are seen in an estuary [Government of India, India]	Accepted - This point is already included in the distance to the sea issue.
6539	4	76	36	0		"consdiered" to "considered" [Nina Hunter, South Africa]	Accepted - text modified
6541	4	76	51	0		Remove "as" [Nina Hunter, South Africa]	Accepted - text modified
31215	4	77	1	77	1	This (‘major role’) sounds as if the antropogenic drivers could be quantified – be clear on how you get to this statement. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - "Major role" changed for "important role". There is no "quantified material" behind this statement, partly due to a lack of studies specificaaly trying to quantify the attribution of impacts to anthropogenic drivers' responsibility in observed impacts (i;e. referring to the attribution issue). However, there is an accumulation of case studies in the literaure demonstrating (although without quantification per se), the role played by human societies in generating their own exposure and vulnerability to CC-related coastal hazards.
6543	4	77	7	0		Change "ragne" to "range" [Nina Hunter, South Africa]	Accepted - text modified
6545	4	77	8	0		Suggest remove "be already" [Nina Hunter, South Africa]	Rejected - The word "already" looks to us important to send a positive message: some action can already take place in favour of long-term adaptation, that is, no robust reasons to delay action.
6547	4	77	9	0		Suggest replacing "Noteworthy" with "Importantly" [Nina Hunter, South Africa]	Accepted - text modified
6549	4	77	10	0		Suggest remove "on" [Nina Hunter, South Africa]	Accepted - text modified
6551	4	77	11	0		Suggest remove "on" [Nina Hunter, South Africa]	Accepted - text modified
6553	4	77	12	0		Suggest remove "on" [Nina Hunter, South Africa]	Accepted - text modified
31377	4	77	14	0		Again, is this decribing in different words the link to concepts of adaptation (e.g. reduction of non-climate drivers) or mitigation (reduction of climate drivers).? [Hans-Otto Poertner and WGII TSU, Germany]	This section really focuses on new insight to understand exposure and vulnerability, and doesn't move to the response space that is rather addressed in section 4.4. However, to improve the flow of the chapter, we added here a sentence saying that this better undretsanding of anthropogenic drivers of E&V has implications for the design of responses (reference made to section 4.4.2) and the enhancing of adaptation pathways (reference made to section 4.4.4).
31217	4	77	19	77	20	The line of sight to evidence assessed in the section is lacking. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - Tracable account had been provided (reference to relevant sub-sections)
6555	4	77	26	0		Suggest remove "for example" as already stated in "such as" [Nina Hunter, South Africa]	Accepted - text modified
6557	4	77	28	0		Change "the coastal zone" to "coastal zones" [Nina Hunter, South Africa]	Accepted - text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20115	4	77	30	86	19	There is a potential gap in the broader section of "Observed Impacts…" (4.3.3). Where would impacts on things like habitabilty of coastal areas, infrastruture damage, etc. go? In section 4.3.2 on the "dimensions of exposure and vulnerability to SLR" there is a discussion of how vulnerability mediates risk (not only exposure), where components such as gender, indigeneity, etc. mediate the degree of risk a community has in the face of SLR. This should be highlighted in the section on observed impacts as well, as there have been observed impacts thus far which are differentiated along racial, class, gender, etc. lines. I would suggest this is added either to the sub-section on 4.3.3.6 (human activities) or as its own subsection. Just to illustrate, (US-specific) examples include: (1) SLR along coastal Louisiana - impacts on indigneous communities and need for resettlemenet (ex// Isle de Jean Charles, Pointe-aux-Chenes); (2) Hurricane Katrina differentiated impacts of loss of housing, etc. ; (3) Kivalina, Alaska - need for resettlement due to accelerated erosion from sea-ice melt and exposure to storm surges/waves. [APECS Group Review, Germany]	Taken into account_The future habitability of low-lying coastal areas cannot be discussed in Chapter 4 as the authors faced strong constrains in terms of text length. Another reason is that the authors had the feeling that such a discussion would require more literature --which is to date very critically lacking-- with a comprehensive understanding of what makes hability today, and how will drivers and intercations change over time according to different SLR scenarios. Note that this issue of habitability is briefly discussed in the Cross-Chapter box on Low-Lying islands and Coasts, but again the lack of literature limited the possibility to go in-depth on this topic. On human dimensions such as gender, class, etc.: here again the authors faced word limitation constrains. Section 4..3.6.4 tries to touch on these elements, but still in a too superficial manner.
21597	4	77	33	77	33	"(ice density, permafrost thaw rates," is unclear – do you mean abundance of ice? – consider rephrasing. Maybe "(rates of ice loss and permafrost thaw, " [Stephan Gruber, Canada]	Accepted_Sentence removed
6559	4	77	34	0		Suggest "changes" becomes singular [Nina Hunter, South Africa]	Accepted_Sentence removed
6561	4	77	35	0		Suggest removing "coastal" - already stated in "coasts" [Nina Hunter, South Africa]	Accepted
31219	4	77	35	77	39	It could be helpful to refer to these six main hazards already in the introduction (e.g., include them in Figure 4.1), so that the reader knows why all the physical science background is important. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted_Now included in the new 4.1 integrative section
6563	4	77	42	0		Suggest replace "caused by" with "of" [Nina Hunter, South Africa]	Accepted_Text modified
6565	4	77	49	0		Insert "is" between "or" and "not" [Nina Hunter, South Africa]	Accepted_Text modified
4815	4	78	0	0		Figure: Local mean sea level should also be connected with the Erosion of land and beaches box, surely? If agriculture is included in the "…land uses" box, then there should be link to the " salinisation" box. [Debra Roberts and Durban Team, South Africa]	Accepted_Figure revised
29943	4	78	0	78	3	reference here is to "traditional knowledge," but elsewhere in this section is to "local knowledge" [Anna Zivian, United States of America]	Accepted_Figure revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31661	4	78	1	0		Figure 4.12. Further development needed in order to aid the reader with an easier navigation throughout the diagram. Better placement of the differenc elements may reduce clutter and overlapping of lines. Also worth exploring is the combitation of arrows and Venn Diagrams for bounding broader categories such as mean vs extreme local sea level rise. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted_Figure revised (more space between the blocks and colors used for an easier navigation).
31663	4	78	1	0		Figure 4.12. The reference to corresponing themes throughout the chapter may be stated in the caption. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted_Figure revised
24103	4	78	1	78	1	Right column, direct impacts, please correct "ecosystem sevices" into "ecosystem services" [Sylvain Ouillon, France]	Accepted_Figure revised
13989	4	78	1	78	3	Figure 4.12 - the arrows between coastal hazards and direct impacts are confusing and become blurred. Increasing the figure size may help these links to be more clearly interpreted. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted_Figure revised
20117	4	78	1	78	3	The difference between mean and extreme SLR is defined later in this page and briefly much earlier in this chapter - it could be a helpful addition to add those definitions into the figure caption. [APECS Group Review, Germany]	Accepted_Figure revised and caption has been developed.
17257	4	78	1	78	5	This figure is very hard to read and follow. The arrows and their lines are too thin, and far too overlapping. It becomes messy and very tedious to try to follow the flow through the diagram because of this. Also, much of the text is too small, particularly italicized text, making the figure difficult to read. [Andra Garner, United States of America]	Accepted_Figure revised
9635	4	78	2	0		This figure notes indigenous knowledge and traditional knowledge; elsewhere the chapter references indigenous knowledge and local knowledge, not traditional. Need to homogenize. [Government of France, France]	Accepted_Figure revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20119	4	78	6	78	22	There are two other reports which attribute observed impacts to anthropogenic SLR. I suggest these given that the literature is sparse in this area and hence I believe the addition of other studies that do this give a more comprehensive review of the diversity of methods and geographic scope being used thus far. One is a conference proceeding (AGU) and one is a report: Strauss, B. H., Kopp, R. E., Sweet, W. V, & Bittermann, K. (2016). Unnatural Coastal Floods: Sea Level Rise and the Human Fingerprint on U.S. Floods Since 1950, (February), 16. /// Kulp, S., Strauss, B., Orton, P., de Moel, H., & Vinogradov, S. (2014). Effect of Climate-Related Sea Level Rise on Sandy Flooding and Damages in New York City. 2014 AGU Fall Meeting Poster Session GC51A-0403, 177(2000), 1. Retrieved from https://agu.confex.com/agu/fm14/meetingapp.cgi/Paper/24778. [APECS Group Review, Germany]	Taken into account_Strauss et al report (2016) have been included, as weel as another publication: Sweet, W. V., & Park, J. (2014). From the extreme to the mean: Acceleration and tipping points of coastal inundation from sea level rise. Earth's Future, 2(12), 579-60au
6567	4	78	7	0		Please rephrase sentence so that meaning is clear [Nina Hunter, South Africa]	Taken into account_The reviewer is right to remind that there are observable impacts of sea level rise on extreme water levels and flooding. Previously, this point was adressed in other sections of the report, but it seems now to be adequately mentionned here. We now write: The literature published since AR5 confirms that extreme water levels at the coast are rising due to mean sea-level rise, with observable impacts on chronic flooding in some regions (Sweet and Park, 2014). The references Sweet and Park 2014 is prefered to those provided by the reviewer being published in a peer reviewed journal.
20121	4	78	8	78	8	Page number not necessary in reference here. [APECS Group Review, Germany]	Accepted_Page number unnecessary here.
6569	4	78	12	0		Change "works" to singular, change "suggest" to plural and remove "possibly" [Nina Hunter, South Africa]	Rejected_"Works" is needed because 2 studies are cited. "Suggest" is adequate. And "possibly" is needed, as this is not absolutely certain that SLR is the driver of island contraction in these 2 examples.
24105	4	78	17	78	17	"Na+CL-", maybe with "+" and "-" as superscripts? [Sylvain Ouillon, France]	Accepted_A reference to the definition of the PSU unit has been given instead.
31221	4	78	17	78	22	Can you give confidence levels here? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted_We provide very high confidence due to very high evidence and agreement (see AR5 WG2 Ch5).
21835	4	78	30	0		It is the high tides in the near term that will permanently submerge margins around the coast (not the mean sea level - which will only encroach further up the current intertidal zone). Ending of sentence implies "protection" is necessary to avoid submergence as a starting position. Better couched as "....low-lying areas unless shoreline protection is deemed necessary." [Robert Bell, New Zealand]	Accepted - text revised.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4115	4	79	4	79	36	The title is 'Exposure', but the content is limited to population, and exposure includes much more than population. [Jiahong Wen, China]	Take in into account - unfortunately there is no new post AR5 continental to global scale literature considering other exposure categories for human systemes.
20123	4	79	4	79	36	Section 4.3.3.2.1 (Exposure) (p.79 lines 5-36) is quite synonymous with the section on settlement trends (4.3.2.2) - the latter is about observed changes in exposure, while the former is about projected changes in exposure. It seems these should be together, and given that the broader section (4.3.2 - dimensions of exposure and vulnerability to SLR) includes other sub-sections on both past and future projected changes, it could make the most sense to move this section to 4.3.2.2. [APECS Group Review, Germany]	Taken into account_The revised version of 4.3.2.2 now has only 1 sentence on LECZ and almost exclusively focuses on current role of settlement trends in exposure. That makes sense as the whole 4.3.2 section is on the drivers of Exposure and Vulnerability. So there is no major overlap with 4.3.3.2, except that both sections mention the Latin America/Caribbean example (to reflect some comments from governements from the Caribeean).
21837	4	79	4	79	36	A 1st national exposure study for New Zealand found that nearly 7% of the national population live in coastal areas below 3 m elevation above mean high water spring, and 4.4% of the national residential building replacement value (92% being in urbanised settings), which is disprorportionately higher than the 0.7% of NZ's land area below 3 m. Study also found that the exposure (road lengths, population, building replacement value) is only half that estimated using accurate high-resolution LiDAR topography, if globally-available DEM's (e.g. Shuttle Radar Topography Mission (SRTM) elevation data) are relied on for exposure studies. In peer reviewed report: Bell, R.G.; Paulik, R.; Wadhwa, S. (2015). National and regional risk-exposure in low-lying coastal areas: Areal extent, population, buildings and infrastructure. NIWA Client Report HAM2015-006 prepared for the Parliamentary Commissioner for the Environment. October, 270 p. https://www.pce.parliament.nz/publications/preparing-new-zealand-for-rising-seas-certainty-and-uncertainty [Robert Bell, New Zealand]	Noted - due to the vast literature and the little space we only cover global or continetla sacle studies.
28469	4	79	4	80	41	We feel that the authors still have not highlighted enough that small islands are most exposed and will be particularly affected by cosatal flooding. For example, the study by Cashman & Nagdee 2017 (Impacts of Climate Change on Settlements and Infrastructure in the Coastal and Marine Environments of Caribbean Small Island Developing States (SIDS). Science Review, 155-73.) could provide some helpful input in this regard. [Government of Saint Lucia, Saint Lucia]	Accepted - we have now highlighted the situation of small islands and included this reference.
10355	4	79	5	80	31	Where is the status of low lying small islands? [Mahmood Riyaz, Maldives]	Accepted - we have now highlighted the situation of small islands.
6571	4	79	14	0		Insert "the" before "coastal" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9637	4	79	38	79	38	This section uses different monetary units; it would be easier to compare if all amounts were in the same unit (i.e., USD or euros). [Government of France, France]	Noted - unfortunately we can not convert because the authors of the study don't provide the year for which the values are given.
8547	4	79	38	81	14	for the problems of artificially separating flood risk from erosion risk see Pollard JA, Spencer T, Brooks SM 2018 The interactive relationship between coastal erosion and flood risk. Progress in Physical Geography [doi: 10.1177/0309133318794498] [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Accepted_A sentence has been added as well as the reference provided by the reviewer.
802	4	79	39	80	31	Section 4.3.3.2.2 is lacking reference to “Quantifying the effect of sea level rise and flood defence – a point process perspective on coastal flood damage” (Boettle, M., et al., doi.org/10.5194/nhess-16-559-2016 , 2016). Combining extreme value theory (Generalized Pareto Distribution) with some plausible assumptions the authors mathematically derive very general relations between average monetary annual losses and sea-level rise. The authors find that “the expected losses can be well approximated by one of three analytical expressions depending on the extreme value parameters“. Moreover, it is shown that “the damage typically increases faster than the sea level rise itself” and that “the absolute value of uncertainty about the flood damage increases with rising mean sea levels” but it decreases in relative to the expected damage. This work is particularly important since the approach is complementary to the other referenced publications. In contrast to “number-crunching” it is based on pure math. [Diego Rybski, Germany]	Rejected - We can not cite all relevant papers due to space limitations.
24159	4	79	42	116	5	8 quotations of "Lincke and Hinkle, 2017" must be turned to "Lincke and Hinkle, 2018" [Sylvain Ouillon, France]	Accepted - text revised
16385	4	79	43	79	43	The study by Garner et al 2017 would be worth discussing here as well (https://www.pnas.org/content/114/45/11861) [Alexander Nauels, Germany]	Rejected - Garner et al don't assess flood risk but only hazard.
6573	4	79	44	0		Change "scenarios" to singular [Nina Hunter, South Africa]	Accepted - text revised
31223	4	79	47	79	47	Be clear about what you mean with “enhanced adaptation” [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - enhanced has been drpped
4817	4	79	47	79	56	The information here needs to appear in SPM, alongside the estimates of investments for mitigation needed for 1.5oC warming - to spur on governments to preventive action and reversing climate change. [Debra Roberts and Durban Team, South Africa]	Noted
31379	4	79	53	0	56	Wouldn’t this be eligible to be elvated to ES, once a confidence statement is provided? [Hans-Otto Poertner and WGII TSU, Germany]	Noted
31225	4	79	53	79	56	Consider providing USD values for the EUR numbers, for better comparability. [Hans-Otto Poertner and WGII TSU, Germany]	Noted - unfortunately we can not convert because the authors of the study don't provide the year for which the values are given.
6575	4	79	56	0		Why is "93" stated? [Nina Hunter, South Africa]	Taken into account - to show the uncertainity range

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31381	4	80	1	0		So why not give a perspective where SLR impacts with adaptation would land depending on sea level rise. Hasn't AR5 SYR provided such a global view of risk that would deserve updating? [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - this done in the remainder of this paragraph
16387	4	80	13	80	15	This assessment appears to be too simplistic as 1) hard coastal protection with dikes presents only one response option b) retreat is not always possible. Please provide a more nuanced assessment of flood risks and include limits to coastal protection in the discussion, departing from e.g. Kwadijk et al. 2010 (Using adaptation tipping points to prepare for climate change and sea level rise: a case study in the Netherlands. Wiley Interdisciplinary Reviews: Climate Change, 1(5), 729-740.) [Alexander Nauels, Germany]	Taken into account - we can only report on the existing literture.
20125	4	80	18	80	21	Given that emissions scenarios are a big considerartion when projecting SLR out to 2100+, this could benefit from a sentence describing this source of uncertainty. A citation that could go along with it: Clark, P. U., Shakun, J. D., Marcott, S. A., Mix, A. C., Eby, M., Kulp, S., … Plattner, G. K. (2016). Consequences of twenty-first-century policy for multi-millennial climate and sea-level change. Nature Climate Change, 6(4), 360–369. https://doi.org/10.1038/nclimate2923. [APECS Group Review, Germany]	Taken into account - this uncertainty is described in Section 4.2
6577	4	80	26	0		Change "sources" to singular [Nina Hunter, South Africa]	Accepted - text revised
16389	4	80	33	81	14	Great to see a substantially improved assessment of coastal erosion! [Alexander Nauels, Germany]	Thank you for this positive feedback.
13137	4	80	35	80	43	Mentaschi et al. 2018 (Nature Scientific Reports: https://www.nature.com/articles/s41598-018-30904-w) found that between 1984 and 2015 an overall surface of 28000km2 of permanent land was lost due to coastal erosion, about twice the surface of gained permanent land., and indicates anthropogenic factors as the domnant driver of change [Michail Vousdoukas, Italy]	Accepted_Reference now included
20127	4	80	39	80	40	"the phenomenon is expanding". The use of the word expanding here can be misleading. Reword to say that the number of cases of sandy beaches eroding is increasing. [APECS Group Review, Germany]	Accepted_Text revised as follows:"there is growing literature indicating that coastal erosion is occurring, e.g.….". This formulation is more precise.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20129	4	80	41	80	41	There are more recent references regarding coastal erosion in the Arctic: "Lantuit, H., Overduin, P.P., Couture, N., Wetterich, S., Aré, F., Atkinson, D., Brown, J., Cherkashov, G., Drozdov, D., Forbes, D.L. and Graves-Gaylord, A., 2012. The Arctic coastal dynamics database: a new classification scheme and statistics on Arctic permafrost coastlines. Estuaries and Coasts, 35(2), pp.383-400." "Irrgang, A.M., Lantuit, H., Manson, G.K., Günther, F., Grosse, G. and Overduin, P.P., 2018. Variability in rates of coastal change along the Yukon coast, 1951 to 2015. Journal of Geophysical Research: Earth Surface, 123(4), pp.779-800." "Farquharson, L.M., Mann, D.H., Swanson, D.K., Jones, B.M., Buzard, R.M. and Jordan, J.W., 2018. Temporal and spatial variability in coastline response to declining sea-ice in northwest Alaska. Marine Geology, 404, pp.71-83." [APECS Group Review, Germany]	Accepted_The 2 more recent references suggested by the reviewer were added in the text. Thank you for this useful suggestion.
25673	4	80	42	0		Include reference to India: National Assessment of Shoreline changes along Indian Coast: Status report for 26 years (1990 - 2016); NCCR Report, July 2018 [Government of India, India]	Accepted_Ref added in the text.
6579	4	80	43	0		Change "system" to "systems" [Nina Hunter, South Africa]	Accepted_
11131	4	80	50	0		Even here, a Submitted paper from one of the author of the report is cited as the only reference. Given that most of the discussion is quite general and based on a common sense narration of the evidence coming from literature, there is no actual reason to cite a single not yet even reviewed paper to support the discussion. [Valentina R. Barletta, Denmark]	Accepted_Reference completed. This paper, which constitutes the most recent and only updated pubication on this topic, has now been published.
15631	4	80	50	0		A Submitted paper from one of the author of the report is cited as the only reference. Please, include a wider literature in the discussion. [EUCE, Belgium]	Accepted_Reference added.
20131	4	80	50	80	50	Update reference "Duvat (submitted)". [APECS Group Review, Germany]	Accepted_Reference updated.
6581	4	80	53	0		"stabilisation when coastal defences" what? Meaning unclear [Nina Hunter, South Africa]	Accepted_Reworded as follows: "e.g. shoreline stabilization by coastal defences"
6583	4	80	54	0		"when enough sediment supply" what? Meaning unclear [Nina Hunter, South Africa]	Accepted_Reworded as follows: "increase in island size as a result of reclamation works"
20133	4	80	55	80	55	"until now", this is a relative term, add year. [APECS Group Review, Germany]	Accepted_Reworded as follows: "...by naturally adjusting to SLR over the past decades"
20135	4	81	2	81	2	Add statement: "and decrease in sea ice" with the reference: Farquharson, L.M., Mann, D.H., Swanson, D.K., Jones, B.M., Buzard, R.M. and Jordan, J.W., 2018. Temporal and spatial variability in coastline response to declining sea-ice in northwest Alaska. Marine Geology, 404, pp.71-83. [APECS Group Review, Germany]	Rejected_The suggestion made by the reviewer concerns the Arctic, while the paragraph to which the reviewer refers to only concerns atoll islands.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31383	4	81	4	0	14	This looks like information that might be useful for ES in illustrating the risk before adaptation but in light of the accomplishment at SYR it would be very useful to develop this into an assessment of adaptation limits, costs and residual risk and their consideration in the damage. The global picture would be very useful in the SPM as well. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted_This information has been introduced in the SPM. Refrence to adaptation limits and residual risks has also been introduced, but not in an extended way due to the lack of literature to rely on.
6585	4	81	5	0		Change "estimates" to singular [Nina Hunter, South Africa]	Accepted – text revised
6587	4	81	6	0		Suggest remove "a" [Nina Hunter, South Africa]	Accepted – text revised
6589	4	81	9	0		Remove "$" as already stated in "USD" [Nina Hunter, South Africa]	Accepted – text revised
6591	4	81	10	81	11	Move "approximately" to before "80%" [Nina Hunter, South Africa]	Accepted – text revised
10357	4	81	11	81	14	Local situation needs to be addressed to be more reliastic [Mahmood Riyaz, Maldives]	Accepted – text revised
33521	4	81	18	81	21	It should be noted that this is via another pathway: salinity intrusion at the coast due to SLR or land-based drought. This is covered in 4.3.3.4.3 but the text here is vague and confusing. [Government of United States of America, United States of America]	Accepted – text revised
1503	4	81	23	0		Information on what are coastal ground water lenses needed [Chandani APPADOO, Mauritius]	Accepted – text revised (aquiferes added and aquiferes and GW lenses defined)
21839	4	81	23	81	39	While given tacit recognition in this paragraph, another significant groundwater impact is the increasing water table from groundwater bodies that already exhibit a tidal signal. Rising water tables then reduce field capacity (to the point water table reaches or exceeds the groundlevel) and increasing exacerbates pluvial flooding, and the magnitude of compound hazards (e.g. intense rainfall coincing with storm tide events on the back of a higher RSL base). Could also be mentioned as another probable compound hazard in Section 4.3.4.1 [Robert Bell, New Zealand]	Accepted – text revised with an additional metion of increasing water tables and an additional reference
10359	4	81	23	83	26	Specific case of low lying small islands need to be addressed [Mahmood Riyaz, Maldives]	Accepted – text revised (GW lenses as a specific for small islands have been added but most of the references already target small island cases)
6593	4	81	29	0		Replace "on" with "for" [Nina Hunter, South Africa]	Accepted - text revised
6595	4	81	37	0		"groundwater lenses salinization" - please make clear [Nina Hunter, South Africa]	Accepted - text revised
3655	4	81	50	81	50	relative sea level --> RSL [Nam SungHyun, Republic of Korea]	Accepted - text revised
6597	4	82	16	0		"river old mouth" - perhaps rather "old river mouth" [Nina Hunter, South Africa]	Accepted - text revised
20137	4	82	27	82	27	Short description of pore water salinity levels will increase readability or a reference to an other section. [APECS Group Review, Germany]	Accepted - text rephrased

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27065	4	82	29	0		It is important to stress that agriculture is an important land use in many deltas around the world due to the fertile soils. In places like the Fraser River Delta (Vancouver Metro Area), much of the agriculture is in the floodplain. Salt water intrusion will have a major impact on agricultural production and the types of agriculture that remain viable in the future. [Kees Lokman, Canada]	Accepted - text revised by adding a sentence on river deltas
6599	4	82	32	0		Suggest replace "on" with "for" [Nina Hunter, South Africa]	Accepted - text revised
22023	4	82	36	84	55	Sandy beaches are conspicuous by their absence here. They are included by Chapter 5 as an ecosystem, and in Fig SPM4, so why not here, where they most logically fit, especially since this section deals with coastal protection? Beaches are the most common shore type over much of the world's ice-free coastline, and they line much of the world's most valuable real estate. As such, they form a uniquely threatened system in terms of SLR. and one that not only provides extensive wave buffering, but also filtration of coastal waters. [David Schoeman, Australia]	Rejected_We acknowledge the value of considering sandy beaches as an ecosystem and some of Chapter 4 authors' reviewed Chapter 5's development on this. We however decided in this sub-section to focus attention ton coastal protection from marine living ecoystems, therefore excluding terrestrial ecosystems' role in reducing risk to people, assets, infrastructure and activities. Note that sub-section 4.3.3.3 suggests that changes in coastal (terrestrial) morphology in sandy environments (example of atoll islands) contribute to determining risk levels to communities.
9639	4	82	38	82	40	Ecotourism is less a cultural service than an economic one; the non-economic elements of ecotourism are probably captured with recreation and aesthetic values, as listed here already. [Government of France, France]	Taken into account_The introduction as a whole had been deleted.
9917	4	82	38	82	43	Ecosystem services have four comonds: supporting function is missing [Úrsula Oswald Spring, Mexico]	Taken into account_The introduction as a whole had been deleted.
29945	4	82	39	82	39	ecotourism is more an economic, not cultural, service; cultural services could include recreation (non-economic), value for traditional customs, religious value [Anna Zivian, United States of America]	Taken into account_The introduction as a whole had been deleted.
2191	4	82	49	82	52	See also Horton et al 2018 (DOI: 10.1038/s41467-018-05080-0) [Robert Kopp, United States of America]	Rejected_Horton et al. (2018) is relavant but not necessary since its focus is to marshes in Great Britian while the cited review of Kirwan and Megonigal (2013) encompasses both marshes and mangroves and provides a more general global review on the processes described.
6601	4	82	50	0		What is accretion? A definition in parentheses would be useful [Nina Hunter, South Africa]	Accepted_Substituted "accretion" with "their growth"
31227	4	82	52	82	56	Please acknowledge the findings of Coldren et al.: Coldren GA, Langley JA, Feller IC, Chapman SK. Warming accelerates mangrove expansion and surface elevation gain in a subtropical wetland. J Ecol. 2018;00:1–12. https://doi.org/10.1111/1365-2745.13049 [Hans-Otto Poertner and WGII TSU, Germany]	Accepted_Citation has been added to discussion on the potential for global environmental change leading to changes in growth rates, productivity and geographic distribution of different mangrove and marsh species.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20141	4	83	4	83	6	A paper has picked up this trend (wetlands not keeping pace with RSLR) past/current day: Jankowski, K. L., Törnqvist, T. E., & Fernandes, A. M. (2017). Vulnerability of Louisiana's coastal wetlands to present-day rates of relative sea-level rise. Nature Communications, 8, 14792. https://doi.org/10.1038/ncomms14792. [APECS Group Review, Germany]	Accepted_Reference has been added to citations that reference marsh drowning due to low sediment availability.
8549	4	83	9	83	9	the processes should be explained here. Greater water depths at marsh margins giving greater wave heights? [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Accepted_Text revised to explicity mention wave erosion; however, the impacts of greater water depth on wave is not discusses as increases in fetch due to changes in geometry have also been shown to be of 1st order importance in the degree of wave erosion at the marsh boundary. This change in fetch has important feedbacks that can not be described appropriately in the space provided, and instead we choose to refer the reader to the citation provided that goes into this process in greater detail.
32621	4	83	28	83	35	I think some studies on OA impacts on corals vs temp impacts on corals (including tank-based, and reef-based assessments) are missing; Can we say which is the most acute threat- OA or extreme temperature? I think we've had some evidence come down on the extreme temp side in the last years. Some studies have suggested a reduced vulnerablity to near-term OA change through buffering ability by coral organisms; that is not the case with temperature. Perhaps noting that next decade or two appears to be temp-driven declines, while a 2050 threat rank is still uncertain. [Kim Cobb, United States of America]	Accepted_The text tones down the impact of ocean acidification.
16391	4	83	28	84	2	IPCC SR1.5 has put forward very specific numbers on coral reef survival under 1.5 and 2 degC scenarios. It may be useful to at least comment on these findings. [Alexander Nauels, Germany]	Accepted_The assessment of SR1.5 have been added.
24207	4	83	28	84	2	Important research on the impact of climate change on coral reefs was carried out by Van Dongeren. Cite for instance: "Quataert, E., Storlazzi, C., Van Rooijen, A., Cheriton, O., Van Dongeren, A., 2015. The influence of coral reefs and climate change on wave-driven flooding of tropical coastlines. Geophysical Research Letters, 42 (15), 6407-6415. " [Sylvain Ouillon, France]	Rejected_This susection had been drastically reduced and the authors couldn't introduce new references.
28471	4	83	28	84	2	Reference should be made here to the IPCC 1.5C Special Report that has updated the Reasons for Concern and shows with high confidence that coral risks are at high risk. It is clear that coral reefs will not be able to keep pace with SLR and other oceanic changes. [Government of Saint Lucia, Saint Lucia]	Accepted_The assessment of SR1.5 have been added.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20139	4	83	31	83	31	I think the impacts of climate change on deep water coral reefs is interlinked with anthropogenic impacts of the oil and gas industry and should be mentioned. See DOI: 10.3389/fenvs.2016.00058. [APECS Group Review, Germany]	Noted. The box needs a significant cut. Since deep sea coral communities have little relevance with the topic of the box, they will be omitted in the next draft.
6603	4	83	32	0		Suggest insert "there has been" before "very" [Nina Hunter, South Africa]	Accepted_But note that this sub-section had been drastically revised and shortened.
6605	4	83	35	0		Remove apostrophe after "degradation" [Nina Hunter, South Africa]	Accepted_But note that this sub-section had been drastically revised and shortened.
20143	4	83	35	83	41	There is a lack of references to make assumptions like this [APECS Group Review, Germany]	Rejected_The authors did not understand this comment as some references are already cited in the text.
6607	4	83	53	0		Suggest change "waves" to singular [Nina Hunter, South Africa]	Accepted. Deleted "s" in waves
20145	4	84	4	84	17	This section discusses seagrasses under SLR. Seagrasses may not be directly impacted by SLR but I find the section to under-emphasise the role of seagrasses for fishing communities, and the fact that seagrasses, are, on the whole declining and heavily impacted by coastal development, aquaculture, trek netting. Perhaps mention that seagrasses need to be a focus for SLR adaptation and mitigation strategies would be useful here - through their role in sediment stabilisation. [APECS Group Review, Germany]	Taken into account but we don't discuss the values of the other ecosystems mentioned. A sentence was added sentence about addition of other human impacts affecting seagrass decline
20149	4	84	11	84	17	First the author says that seagrass growth will be negatively impacted, followed by saying that growth will be positively impacted. The potential positive effects will likely have no positive effect, because the negative effects are more criticial for growth and survival. [APECS Group Review, Germany]	Rejected_To the authors' knowledge, we do not have research demonstrating that the potential adverse effects will be greater than the potential benefical effects, this while this may be true, we do not have the evidence to back up the statement.
25675	4	84	19	84	19	Include references to protection offered by mangroves - very little emphasis has been given to this and instead corals and seagrasses have been highlighted; mangroves have proved effective in coastal protection from multiple perspectives from extreme events such as cyclones and tsunamis. [Government of India, India]	Taken into account_Please, note that the protection service provided by mangroves is already mentioned in sub-section 4.3.3.5.1 that considers "marsh and mangrove systems". Additional references on the protection service provided by mangroves have been added in sub-section 4.3.3.5.4 (Coastal protection by marine ecosystems): Zhang et al., 2012; Barbbier, 2016; Menéndez et al., 2018.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
8551	4	84	20	84	40	Weakly referenced here. See Hu K, Chen Q, Wang H (2015) A numerical study of vegetation impact on reducing storm surge by wetlands in a semi-enclosed estuary. Coastal Engineering 95:66-76 McIvor AL, Spencer T, Möller I, Spalding M 2012 Storm surge reduction by mangroves. Natural Coastal Protection Series: Report 2. Cambridge Coastal Research Unit Working Paper 41. The Nature Conservancy and Wetlands International 36.Liu H, Zhang K, Li Y, Xie L (2013) Numerical study of the sensitivity of mangroves in reducing storm surge and flooding to hurricane characteristics in southern Florida. Continental Shelf Research 64: 51-65. And mention Wamsley et al. (2010) here [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account_Some references have been added in the text: Zhang et al., 2012; Barbier, 2016; and Menéndez et al., 2018 for mangroves; Hu et al., 2015, for marshes.
31385	4	84	22	0	32	This quantitative background information and the degree of loss would be very useful to see in the ES and possibly SPM. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account
13991	4	84	33	84	36	The specific details on attenuation could be clearer, what does the range cover in terms of types and marsh and location? Is this greater or less than would be expected? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted_The reader is now explicitly refered to the Narayan et al., 2016 citation for locations considered in study. A discussion on whether these numbers are greater or less than expects is not provided as the range is quite broad reflecting the site specific nature of wave attenuation that is also highlighted in the text.
20147	4	84	35	84	35	Update reference "Castagno et al. (In review)". [APECS Group Review, Germany]	Accepted_Publication has been accepted and is now notes as "in press"
13993	4	84	39	84	40	Which ecosystems are being referred to here? All coastal ecosystems? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted_Changed to coastal ecosystems.
31387	4	84	48	0	53	This quantitative background information and the degree of loss would be very useful to see in the ES and possibly SPM. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account
25677	4	84	50	84	54	Removal of corals resulted in the erosion and submergence of islands in Gulf of Mannar (Raj, et al.,2015) Diraviya Raj, K., Mathews, G., Rajesh, S. and Patterson Edward, J. K. 2014. Vaan Island of Gulf of Mannar, Southeast coast of India – on the verge of submergence. Indian Journal of Geo-Marine Sciences Sciences, Vol.44(6): 892-895. [Government of India, India]	Rejected_This paper is outside the scope of this sub-section that deals with ecosystem srvices and not with the causes of island erosion. Additionally, this paper focuses on one single small island only, and therefore does not provide enough added value to be considered at this stage.
13995	4	84	50	84	55	Given the non-climate driven basis of tsunamis it is unclear why this text is here. Is it trying to demonstrate that the effects of any tsunami could be exacerbated by SLR? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted_The tsunami discussion at the end of this paragraph has been removed.
20151	4	84	53	84	55	New literature has not been added yet. [APECS Group Review, Germany]	This sentence has been removed from the Final Draft.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31229	4	85	1	0		This section would benefit from an economics perspective – how much damage will SLR cause for agriculture, tourism, etc., and where? Parallel to that, the non-monetary losses (as described in 4.3.3.6.4 need to be highlighted). [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account_The authors couldn't find robust literature on economic cost of SLR especially on these various sectors, and at the global scala.
33523	4	85	1	0		Add section on effects on recreation, which is separate from tourism: lost access, changes in wildlife and opportunities for wildlife viewing, boating, etc. [Government of United States of America, United States of America]	Accepted_Text modified
20157	4	85	1	86	19	There is little/nothing mentioned on the impacts of indigeneous people. [APECS Group Review, Germany]	Rejected_Comment not understood by the authors; to what "impacts of indigenous people" does the reviewer refer to? This section focuses on the impacts of SLR on some human dimensions.
20153	4	85	3	85	22	In rural communities soil salinization may also act to shift livelihoods from agriculture to another pressure, or reduce livelihood diversity as agriculture is no longer an option, thereby reducing a rural communities abilitiy for resilience under a changing climate. An unpublished example of this are fishing communities on Bazaruto island off of Mozambique, where a storm broke through a sand dune and flooded the plain where communities farmed. They can no longer farm there because of the salt in the soil, even though the sea water has long shifted. With fish populations declining, the communities here are running out of livelihood options. [APECS Group Review, Germany]	This point is correct, but due to length constrains and the critical need to reduce text from the Second Order Draft to the Final Draft, we could not include this complementary process and feedback effects. We however introduced the notion of "(loss of) livelihood diversification
6609	4	85	5	0		Insert "has" before "affects" [Nina Hunter, South Africa]	Accepted_Text modified
20155	4	85	8	85	9	I needed to look up what taro patches are. Maybe include that this is an edible cultivated plant. [APECS Group Review, Germany]	Accepted_Text modified
6611	4	85	13	0		Was "off" meant instead of "of"? [Nina Hunter, South Africa]	Accepted_Text modified
16393	4	85	24	85	41	The more detailed SOD assessment of impacts on tourism is much appreciated! [Alexander Nauels, Germany]	Thanks for this feedback.
27229	4	85	25	85	41	Admittedly, Coastal Tourism encompasses "a lot" but this brief paragraph doesn't do justice to the environmental / socio-political dimensions that should be discussed. If this is not the place for it, then allude to other portions of the paper where they will be discussed. [Michael Schwebel, United States of America]	Rejected_This point is absolutely correct, but indeed that is not feasible in a so limited space to do justice to all of the cascading effects of SLR on tourism-related dimensions. This happens in a context where we also faced, for this Final Draft, the imperative of dratically reducing the text length (at the chapter level) of the Second Order Draft, which explains that already synthetic sub-sections such as this one couldn't be expanded.
6613	4	85	26	0		Was an actual example meant to be in parentheses along with the references, as in the other cases before and after? [Nina Hunter, South Africa]	Accepted_Text modified
6615	4	85	32	0		Suggest remove "to" [Nina Hunter, South Africa]	Accepted_Text modified
6617	4	85	37	85	38	Change "tourism infrastructures themselves" to "tourism infrastructure itself" [Nina Hunter, South Africa]	Accepted_Text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
12021	4	85	41	0		See effects of climate change on critical infrastructure related to tourism in Jamaica and St Lucia: Increased disruptions on ports and airports due to high temperature and flooding (Monioudi et al; https://link.springer.com/article/10.1007/s10113-018-1360-4) [Michail Vousdoukas, Italy]	Accepted_Refrence already cited in this sub-section.
6619	4	85	53	0		Suggest change "at" to "in" [Nina Hunter, South Africa]	Accepted_Text modified
6621	4	86	3	0		Suggest replace "of" with "from" [Nina Hunter, South Africa]	Accepted_Text modified
192	4	86	6	86	7	There is slow but increasing number of studies on climate change and cultural heritage intersection over the past decade. Please add following peer-review paper focusing on filling this important knowledge gap of how diverse types of cultural heritage are globally being affected by climate impacts. A systematic literature review by Fatorić and Seekamp (2017a) is first such study that globally analyze current scientific literature of climate change-cultural heritage intersection. Please add next to (Marzeion and Levermann, 2014) also following reference: Fatorić, S. & Seekamp, E. (2017a) Are cultural heritage and resources threatened by climate change? A systematic literature review. Climatic Change 142(1-2), 227-254. [Sandra Fatoric, United States of America]	Accepted_After reading this paper, we decided to include it as it offers a broad perspective on the issue, although not focussed on SLR-reletd impacts to cultural heritage (note that this chapter tries as much as possible to be SLR-focussed).
194	4	86	10	86	10	A study by Fatorić, S. & Seekamp, E. (2017b) applied decision analytic approach to assess values of cultural heritage at risk from climate impacts in the United States. This study found various challenges and opportunities in climate adaptation and preservation disciplines, together with need for transparent prioritization of cultural heritage for preservation under changing climate. So please add next to "valuing the physical/ecological/human" also term "cultural" and please use the reference by Fatorić, S. & Seekamp, E. (2017b). Additionally, please add: Fatorić and Seekmap (2017b, 2018) applied a value-based approach (structured decision-making approach) that enabled them to bridge the science-policy-management nexus by integrating current science and policy with the values of federal and state decision makers and policy makers, including local stakeholders. Their approach enabled out-of-the-box thinking in the face of dire climate and economic uncertainties in the U.S. Fatorić, S. & Seekamp, E. (2017b) Evaluating a decision analytic approach to climate change adaptation of cultural resources along the Atlantic coast of the United States. Land Use Policy 68, 254-263. [Sandra Fatoric, United States of America]	Accepted_Interesting reference included.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
22519	4	86	15	86	19	Suggest a new section dealing with the challenges for international law, specifically in the context of small island states and the rights of indigenous people. Loss of territorial sovereignty is an issue of international law, not social values. Sovereignty is a legal concept applicable only to nation-states or indigenous territory within nation-states. It does not make sense to speak of territorial sovereignty being lost in a partial sense within a large nation-state or in terms of individual property. The international law on loss of territorial sovereignty is being addressed in research, for example Maxine Burkett, who considers a possible solution through the development of new international legal principles on 'ex-situ sovereignty'. Burkett, M. (2011). The nation ex-situ: On climate change, deterritorialized nationhood and the postclimate era. Climate Law, 2, 345–374. [Government of Australia, Australia]	Taken into account_This is a good point and we modified the wording to avoid refering to "territorial sovereignty"; thanks for this important comment. Note also that the international law aspect is briefly mentionned in the integrative cross-chapter box on "Low-Lying islands and coasts", and that now the Burkett 2011 refereence is included.
196	4	86	19	86	20	Please add the impotence of cultural heritage and climate change intersection here: Despite the high level of scientific and policy developments in climate change and various natural and socio-economic systems, a limited research has been conducted on the impacts of climate change on diverse cultural heritage globally (Fatorić and Seekamp 2017a). Additionally, please add: Fatorić and Seekamp (2018) developed a novel and value-based framework for measuring historical significance and use potential of historic buildings at risk from a changing climate in the United States. The novel framework can stand alone as a transparent prioritization tool for assisting cultural heritage, or when combined with climate vulnerability assessments, it can be used for selecting optimal climate change adaptation strategies that retain as much historical significance as possible within cultural landscapes. Fatorić, S. & Seekamp, E. (2018) A measurement framework to increase transparency in historic preservation decision-making under changing climate conditions. Journal of Cultural Heritage 30, 168-179. [Sandra Fatoric, United States of America]	Rejected_Issue already discussed earlier in this sub-section.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
16395	4	86	21	86	33	Even though most low lying areas around the globe are affected, it has to be clearly highlighted that SLR related risks are generally higher in regions with already low adaptive capacity, like the Pacific islands or the Carribean. [Alexander Nauels, Germany]	Taken into account_This section had been almost entirely re-written. Now, differences in riks are highlighted, based on the refinement of the burning ember figure (now in section 4.1.2).
10361	4	86	23	86	33	Specific case of low lying islands need to summerised here as well as low-lying coastal areas is too general [Mahmood Riyaz, Maldives]	Taken into account_This section had been almost entirely re-written. Now, differences in riks are highlighted, based on the refinement of the burning ember figure (now in section 4.1.2).
9641	4	86	31	86	31	There is no 4.3.2.6, is it refering to 4.3.2.5 instead ? [Government of France, France]	Taken into account_This section had been almost entirely re-written. Now, differences in riks are highlighted, based on the refinement of the burning ember figure (now in section 4.1.2).
31231	4	86	37	86	50	Suggest to cut this paragraph, as it is too generic and covered by Chapter 6. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account_This sub-section had been deleted from section 4.3.4
6623	4	86	40	0		Change "contributes" to "contribute" [Nina Hunter, South Africa]	Taken into account_This sub-section had been deleted from section 4.3.4
31233	4	86	52	87	9	Suggest to move this paragraph to the next section and remove sub-headings 4.3.4.1 and 4.3.4.2. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account_This sub-section had been deleted from section 4.3.4
2451	4	86	54	86	54	Wahl and Plant (2015) is the wrong reference, it should be Wahl et al. (2015) (https://doi.org/10.1038/nclimate2736). This paper assesses the dependence between storm surge and precipitation, whereas Mofthakari et al. (2017) focus on river discharge, an important difference! [Thomas Wahl, United States of America]	Taken into account_This sub-section had been deleted from section 4.3.4
16397	4	87	11	88	24	The RFCs have also been revised in SR1.5 which is not yet discussed but has to be included. Consistency between the IPCC SRs has to be ensured wherever possible. Please revise this section accordingly. [Alexander Nauels, Germany]	Accepted_Reference is now made to the IPCC SR1.5 chapter 3. Note however that the SR1.5 chapter doesn't revise the "SLR" burning ember developed in the AR5 Synthesis Report.
4117	4	87	13	87	16	Vulnerability is an inherent property of the social-ecological system and has nothing to do with the acceleration of the SLR. It is recommended to replace "Vulnerability" with "risk" or delete 'not only because of the acceleration of SLR over the last decades' in the sentence. [Jiahong Wen, China]	Accepted_This section had been entirely modified.
6625	4	87	30	87	31	Suggest replace "estimate" with "estimates are" [Nina Hunter, South Africa]	Accepted_This section had been entirely modified.
31389	4	87	33	0	34	This seems not clear enough on how capacity and limits to adaptation are integrated in the risk assessment. [Hans-Otto Poertner and WGII TSU, Germany]	Rejected_Here we only consider the conslusions from previous publications. In terms of the SROCC chapter 4 burning ember diagram, full details are provided in the Supplementary Information to chapter 4 (see SI4.2).
6627	4	87	34	0		Suggest insert "a" before "1m" [Nina Hunter, South Africa]	Text modified

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28473	4	87	47	89	24	Not clear why the focus is on the small category of urban atoll islands rather than small islands in general. Many small islands face high risks but are not atolls. Changing this category to small islands would provide information for a greater group of high risk islands. [Government of Saint Lucia, Saint Lucia]	Taken into account_The reviewer is right, but here the exercise consisted in focussing on some specific geographies/territories to allow for discussing risk at a more local scale, and show that the Burning Ember appraoch could be developed beyond the global or regional level. The category "Urban atoll islands" has not been changed as the risk has been assessed based on the literature on spceific case studies (see SI4.2 for details). However, connections have been made already with the authors of the WG2 AR6 chapter on Small Islands, and work will be developed in collaboration.
9643	4	87	50	87	50	There is no section 4.3.2.7, which one is intended here? [Government of France, France]	Accepted_Text modified
29947	4	87	50	87	50	there is no 4.3.2.7 [Anna Zivian, United States of America]	Accepted_Text modified
31235	4	88	1	88	2	Which case studies are you referring to? You presented only three case studies (Box 4.1, with Shanghai/New York, Nile, Fiji) explicitly, so far. [Hans-Otto Poertner and WGII TSU, Germany]	Case studies tahta are referred to here are the local case studies used to assess risk and develop the Burning embers figure (now located in 4.1.2). The Supplementary material detail these methodological aspacets (see SI4.2).
6629	4	88	28	0		Change "epidosdes" to "episodes" [Nina Hunter, South Africa]	Accepted_Text modified
29353	4	88	43	0		Propose integrated indices for assessing the degree of erosion-elevation sea level adapted to the South (similar to that achieved in Europe such as ... .. for example). Because the maps of the level of coastal vulnerability are very rare and punctual (Rabehi, 2018). [Walid Rabehi, Algeria]	Rejected_The methodology to develop the Burning Embers figure (now located in 4.1.2) is described in Supplementary Information (see SI4.2).
11133	4	89	0	0		(Response to Sea Level rise), discusses the literature for global costs and effectiveness of different kinds of measures. It is very “smooth” to read [Valentina R. Barletta, Denmark]	
15255	4	89	0	0		We cannot accept the way limits to adaptation are conveyed in this figure, i.e. by suggesting full relocation as only consequence and a "annihilation" of risk. This "assessment" is policy prescriptive and has to be removed together with bar C. [Government of Gambia, Gambia]	Accepted_This dimension of the assessment has been removed. Now the assessment doesn't anymore refers to this.
15633	4	89	0	0		(Response to Sea Level rise), discusses the literature for global costs and effectiveness of different kinds of measures. It is very “smooth” to read. Please, see also the comment to the SPM chapter about joining together the general material on risk management that is found in different places in this report (and in SRCCL), to ensure that specific chapters concentrate on the parts relevant to their scope (i.e. SLR-specific aspects of risk in this case). [EUCE, Belgium]	Thank you for this positive feedback.
22521	4	89	0	0		Suggest Figure 4.13 include the percentile range in panel A as most readers are likely to percieve this as the full potential range of SLR (not just the likely range). [Government of Australia, Australia]	Accepted_This figure has been reworked and refined according to recent developments in section 4.2. A caption has also been added.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
13997	4	89	0	89		Figure 4.13 - in Panel A it is unclear what the blue and pink shaded areas refer to. In addition in the key underneath the panels it is not clear what the corresponding aggregated scores refer to. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account_This figure was mostly a mock-Up at the time of the SOD and now has been entirely revisited. Panel A has been refined according to advances in section 4.2, and burning embers in panel B have been finalized. The legend has also been clarified. Note also that the corresponding aggregated scores are described in Supplementary Information SI4.2.
26239	4	89	0	89		Figure 4.13 Incorporates substantial information into one figure, but is complex and not instantly accessible and thus I am not sure it adds value over the text, other than to break up the text maybe [Katherine Yates, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account_This figure was mostly a mock-Up at the time of the SOD and now has been entirely revisited. It has been incorporated in a new intergative section (4.1.2) and the text on methodological advances and key findings has been refined (section 4.3.4). Length constrains however prevented the authors to go in-depth into the findings description.
22525	4	89	0	111		Suggest including the option of "avoid" as a response to SLR since directing growth and intensification away from at-risk areas is an important tool for adaptation that is distinct from planned retreat as discussed in this chapter. [Government of Australia, Australia]	Noted - we have included advance in the list of SLR response options, and explicitly explained how avoidance strategies do away with need for intervention.
11135	4	89	0	112		This section and subsection are generally well written, but a bit too general on one hand and too single-case-experience-based in the other. This is probably inevitable, given that the problem that those sections address is very complex (interplay of different heterogeneous hazards in different regions of the world with political, social, cultural, economic characteristics), and it is hardly even possible to imagine that exhaustive scientific works has even started about this. Therefore, I appreciate the effort in harmonizing the discussion of the different topics following the same predefined scheme, helping the reader to make a comparison. But the overall impression is that of a very fragmented work in which individual episodes or experience dominate over a deeper understanding, and the final impression is that there is not so much that can be said about this, beyond using the common sense. [Valentina R. Barletta, Denmark]	Taken into account in revisions to text in which we seek to provide a balance between assessment of technical evidence about these approaches and the need to provide plain language explanation for readers.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11137	4	89	0	112		And common to the whole section there is the problem that almost no one of the responses described are directly Sea Level Rise related, because, as clearly stated often in the text, the slow sea level rise is almost nowhere considered an immediate threat, therefore all the responses are actually for Extreme events (storms, flooding, …), and the main (only) connection with the SLR is that according to the current model the frequency of those events is expected to increase substantially. But it is difficult to the attribute the costs/benefits to the SLR-response, and the SLR references throughout this section look often quite “artificial”. [Valentina R. Barletta, Denmark]	Noted - this section uses the best available empirical evidence on the application of decision analysis in SLR response decision-making. It is a rapidly growing area of scholarship but there remain significant gaps as our assessment identifies.
15635	4	89	0	112		This section and subsection are well written, but a bit too general on one hand and too single-case-experience-based in the other. This is probably inevitable and the effort in harmonizing the discussion of the different topics following the same predefined scheme, helping the reader to make a comparison, it appreciated. However, the overall impression is of a very fragmented work in which individual episodes or experience dominate over a deeper understanding, and the message passed is that there is not so much that can be said about this, beyond using the common sense. Please, consied revising. [EUCE, Belgium]	Repeat of 11135
15637	4	89	0	112		This applies to the entire whole section: almost no one of the responses described are directly Sea Level Rise related, because, as clearly stated often in the text, the slow sea level rise is almost nowhere considered an immediate threat, therefore all the responses are actually for Extreme events (storms, flooding, …), and the main (only) connection with the SLR is that according to the current model the frequency of those events is expected to increase substantially. However, it is difficult to attribute the costs/benefits to the SLR-response, and the SLR references throughout this section look often quite “artificial”. [EUCE, Belgium]	See response to 11137
25425	4	89	0	130	0	The role of the insurance is not properly treated : how to use insurance in adaptation to CC ? See European Union, Using insurance in adaptation to vlimate change, 2018, doi: 10.2834/036674 [Boris LECLERC, France]	Rejected_The scope of this section is not to describe reponses in detail, but rather to assess future risk in a more broad way. The methodology to develop the Burning Embers figure (now located in 4.1.2) is described in Supplementary Information (see SI4.2). Note that the role of insurance is discussed in various sub-sections of section 4.4.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15087	4	89	1	0		We'd strongly advice against the introduction of an adaptation dimension into the RFC-representation. The iconic RFC-figure summarizes information on a very high generic level, which is already very complex and difficult to grasp in its entirety. While we generally appreciate the differentiated presentation of risk at different levels of adaptation, as done e.g. in AR5 SYR Figure SPM.8 and underlying analysis in the WGII report, we consider it ill-advised to change the RFC concept in such a way. One of the key conceptual challenges here is the lack of a temporal dimension in the original RFC - the risk levels refer to absolute values, however for adaptation, the rate of change is extremely important as well. Also, ignoring the cost of adaptation / defense options and their likely equality and sustainability implications conflicts with the general approach of the IPCC during its 6th assessment cycle to improve integration across multiple dimensions of sustainable development. Given the extreme complexity involved in assessing effective adaptation against certain measures of climate change at a meta-level, and the unsolved issue of cost and sustainable development implications, we'd strongly advise to reconsider the idea of adding an adaptation component to the RFC representation, and urge the authors to find a different visual representation. Else you may run the risk of weakening the concept as a whole, especially since the assessment is not available for expert review. [Government of Germany, Germany]	Taken into account_This figure was mostly a mock-up at the time of the SOD and now has been entirely revisited. Note that the full methodology as well as the detailed results of the assessment are available in the Supplementary Information to this chapter (SI4.2). On the contend, we understand the comment and acknowledge the RFC approach has some limitations, especially concerning the non-integration of rates of change. This doesn't only apply to the consideration of adaptation (bars (B) in the figure, but also to the assessment of risk without adaptation (bars A, and classical RFC appraoch). But the RFC approach proved to be very useful in communicating risk increase over the century and according to various end-century warming scenarios. With Figure 4.13 (now figure 4.3, see section 4.1.2), the authors argue that the RFC approach also offers an opportunity to communicate on the potential benefits of adaptation, even imperfectly (so as risk assessment is necesarily imperfect). The added-value in this chapter is to focus on local case study examples (each generic geography is decribed with a set of real-world examples; see SI4.2) and on a methodology that considers metrics related to adaptation ("Implementation level of adequately calibrated hard engineered coastal defences", "Implementation level of restoration of degraded ecosystems, or creation of new natural buffers areas", "Implementation level of measures such as coastal retreat, inland relocation, and international migration", "Limit subsidence"; see details in SI4.2). Note tha the authors also decided to limit the approach to the consideration of two major adapatataion scenarios, without/with, and remove the third scneario proposed in the SOD (brs C in the figure).
31665	4	89	1	0		Figure 4.13. The burning ember for AR5 should be equal size as the rest. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account_The global Burning Ember has been removed from the FGD version of the figure.
31667	4	89	1	0		Figure 4.13. The burning ember leyend might be place vertically and of the same size for easier and direct comparison with the actual embers. [Hans-Otto Poertner and WGII TSU, Germany]	We considered this option but could figure out how to do it due to the already busy panels A and B (that need some space horizontally to not look messy).
20159	4	89	1	89	1	I suggest to change the colour code to represent the level of additional risk due to SLR: use a monochrome shading, from low intensity to high intensity. This will help reading the PANEL B. [APECS Group Review, Germany]	Rejected_This figure uses the IPCC color code for Burning Ember that has been developed from AR3. Discussions happened during one of the 4 Lead Authors Meeting about this, but decision has been made to keep using the orginial colour coding.
20161	4	89	1	89	1	I can't see to what the legend "Corresponding aggregated scores" is refering to. It seeems that this legend doesn't add any information in the Graph. If correct, please remove this from the legend. [APECS Group Review, Germany]	Taken into account_This figure was mostly a mock-up at the time of the SOD and now has been entirely revisited. The background information is developed in the Supplementary Information associeted to this chapter (see SI4.2), which describes the methodological protocole, the metrics used to assess risk without and with adaptation, and the detailed results of the assessment.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
10363	4	89	1	89	24	This figure needs to be completed [Mahmood Riyaz, Maldives]	Taken into account_This figure has been finalized: risk assessment done for each generic geography, finalisation of the associetd bunring embers, and developmant of the Supplementary Information (see SI4.2) providing details on the methodological protocole, the metrics used to assess risk without and with adaptation, and the detailed results of the assessment.
16399	4	89	2	89	24	The dicussion on limits to adaptation for atoll islands is not clear. The reasons for concern indicate very high risk when limits to adaptation are reached. Thus having a specific burning ember on limits to adaptation with no purple color indicating that limits have been reached is quite confusing. Suggest to incorporate limits to adaptation into burning ember B for atoll islands and clearly indicate where limits to adaptation will be reached. Suggest deleting burning ember C for atoll islands as this is not clear. [Alexander Nauels, Germany]	Taken into account_This adaptataion scenario referring to the "limits to adaptataion" has been removed from the final assessment.
28475	4	89	2	89	24	The dicussion/visualisation of limits to adaptation for Atoll islands is not clear. The reasons for concern indicate very high risk when limits to adaptation are reached. Thus having a specific burning ember on limits to adaptation with no dark purple color indicating that limits have been reached is very confusing. The reasoning that relocation follows after limits to adaptation are reached must not be communicated, as it is not within the scope of this report to make ethical and policy prescriptive assumptions on what the consequences of reaching the adaptation limits are. If the "annihilation of in situ vulnerability' including white tip of bar C is not replaced with less prescriptive language and dark purple/black colours, the entire bar C will have to be deleted. The same holds for Figure SPM.4 [Government of Saint Lucia, Saint Lucia]	Taken into account_This adaptataion scenario referring to the "limits to adaptataion" has been removed from the final assessment.
28477	4	89	2	89	24	The IPCC 1.5 Special Report has shown that coral reefs will be virtually eliminated and so will be unable to provide coastal protection. Including coral reefs as a means for adaptation is thus unrealsitic and the risk should be higher under scenario B for atoll reef islands. [Government of Saint Lucia, Saint Lucia]	Taken into account_This has been considered in the revision of the Urban Atoll Islands (which was only a mock-up at the time of the SOD). Note that all background information is described in the Supplementary Information (see SI4.2): methodological protocole, metrics used to assess risk without and with adaptation, and detailed results of the assessment.
6631	4	89	9	0		Change "county" to "country" [Nina Hunter, South Africa]	Accepted
16401	4	89	31	89	31	Why responses to global mean sea level rise only? Please clarify. [Alexander Nauels, Germany]	Accepted. This was a typo.
22523	4	89	31	90	11	Suggest this section include a general overview of the typical elements of integrated coastal zone management (legislative/policy frameworks, planning, works, monitoring, capacity building etc). [Government of Australia, Australia]	Rejected - Unfortuntly the page limit does not allow us to do this.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20163	4	90	6	90	8	The sentence can be rephrased as " The observed responses, costs, benefits…… are given in section 4.4.3". [APECS Group Review, Germany]	Accepted. Text revised.
31237	4	90	14	0		Could this (Types of Responses) be a box rather then a sub-section, since it is not really part of the assessment but important background information? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted. We introduced this Box now.
32071	4	90	14	0		would be nice to have a figure illustrating the adaptation responses [Marjolijn Haasnoot, Netherlands]	Accepted. We now introduced a Figure in the Box on Responses.
4247	4	90	16	90	22	In many coastal areas around the world, the human response to subsidence (caused by earthquakes, water pumping, etc.) is similar to a response to a fast SLR (one or two order of magnitude larger than present GSLR). [Josep Ramon MEDINA, Spain]	Accepted - text revised.
4249	4	90	16	90	22	It is relevant to point out the observations given by Esteban (2018) on extreme cases of land subsidence in Tokyo, Yakarta and Danajon Bank (small island in the Philippines). [Josep Ramon MEDINA, Spain]	Accepted - text revised.
4251	4	90	16	90	22	Some are highly populated coastal communities adapting to several meter of land subsidence (ratios up to 215 mm/year in Yakarta) and Danakon Bank is small island with a poor community adapting to a sudden earthquake-induce subsidence of 70 cm. [Josep Ramon MEDINA, Spain]	Accepted - text revised.
4253	4	90	16	90	22	Case studies of human adaptation to fast subsidence may be a good indicator of future human adaptation to GSLR. [Josep Ramon MEDINA, Spain]	Accepted - text revised.
13999	4	90	16	110	21	To reduce text, this text could be removed and the synthesis slightly expanded. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted. We removed the synthesis.
1915	4	90	20	90	22	Perhaps it may be useful to include a citation to responses of sea level rise to negative emissions (carbon dioxide removal), e.g. Tokarska, K. B. & Zickfeld, K. The effectiveness of net negative carbon dioxide emissions in reversing anthropogenic climate change. Environ. Res. Lett. 10, 094013 (2015). [Katarzyna B. Tokarska, United Kingdom (of Great Britain and Northern Ireland)]	Taken into account. We now reference the 1.5°C report that has reviewed this literati.
17543	4	90	20	90	22	Might be worth noting that this information can be found in the IPCC 1.5C Special Report. [Kristin Campbell, United States of America]	Accepted. Text revised.
17655	4	90	20	90	22	Should note that this information is available in the IPCC 1.5C Report. [Durwood Zaelke, United States of America]	Accepted. Text revised.
20165	4	90	21	90	22	No need of the reference here. [APECS Group Review, Germany]	Accepted. Text revised.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27067	4	90	25	0		How about also adding Avoid. There is a distinct difference between pro-active and reactive planning. Avoid can be described as “planning so that development does not take place in areas subject to coastal hazards associated with sea level rise and climate change”: https://www.cip-icu.ca/Files/Awards/Planning-Excellence/Sea_Level_Rise_Adaptation_Primer_-_Summary_Fact_Sh.aspx [Kees Lokman, Canada]	Rejected - avoid is not a standard term in the literature. It is treated under accommodate.
20167	4	90	25	90	27	"throughout the world" can be replaced with across the world/globe. Sentence does not make sense, but is repeted two times after comma. The sentence can be divided in two. [APECS Group Review, Germany]	Accepted. Text revised.
3803	4	90	25	90	30	Authors are insisting on the importance of "Advance" in coastal adaptation in addition to three conventional categories such as Protection, Retreat, and Accomodation. However, I think Advance can be a different dimension from these three. There are another categories of adaptation such as Reactive and Proactive adaptations. "Advance" can be categorized one of the Proactive adaptations. [Makoto Tamura, Japan]	Taken into account. There is no unique way of categorizing coastal responses. We decided to include advance because it has been around in the literati for a long time and is opposite to retreat.
32073	4	90	26	0		a reference could be added to this paper, that also considers advance and has illustrations: http://dx.doi.org/10.4236/jbcpr.2014.21007 [Marjolijn Haasnoot, Netherlands]	Accepted. Text revised.
6633	4	90	32	0		Change "include" to "includes" [Nina Hunter, South Africa]	Accepted. Text revised.
25667	4	90	33	90	35	Coastal structures such as seawalls and breakwaters also enhance erosion as they affect coastal processes and impact littoral drift [Government of India, India]	Taken into account. This is described in Section 4.4.3.2.5 ”Co-benefits and negative consequences of hard and sediment-based protection”
6635	4	90	38	0		Should it not be "ecosystem-based" instead of "ecosystems-based"? [Nina Hunter, South Africa]	Accepted. Text revised.
6637	4	90	47	0		Suggest replacing "they are" with "it is" [Nina Hunter, South Africa]	Accepted. Text revised.
27069	4	90	50	0		Accommodation measures also often aim to reduces negative implications of SLR on coastal ecosystems. [Kees Lokman, Canada]	Accepted. Text revised.
14003	4	91	0	91		Table 4.7 - It is unclear what habitat change and loss refer to in this table, is it creation/loss of habitat? The definition of this section will be key for ensuring the correct boxes are ticked (for example mega-nourishment could be used to create habitat as could natural sedimentation, however for retreat, habitat creation would only occur if structures are removed, otherwise coastal squeeze may occur). [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted. The table has been droped.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
2203	4	91	0	92		Suggest the inclusion of floatation, a traditional response to rising water level under “Accommodation/Physical”. The best example is the floating settlement in Tonle Sap, Cambodia, and some coastal areas of Asia. This also illustrates the importance of LK and IK, often overlooked in SLR adaptation. [Poh Poh Wong, Singapore]	Accepted. Text revised.
14001	4	91	2	91	4	Please ensure the terms relating to planned relocation are consistent throughout the text (both here and in the wider chapter). For example both planned retreat, managed realignment and managed relocation are referred to in this paragraph. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Text revised.
25791	4	91	11	0		Under "Responses" with "Hard" category, along with Groynes, "Artificial Reefs" may be added which play multipurpose role such as reduction of erosion, increase of biodiversity and fish production and livelihood sustainability to small scale fishers. [Government of India, India]	Accepted. We have now dropped the table because we can not exhaustively list all responses.
31669	4	91	11	0		Table. 4.7. This Table might be transformed into a very interesting figure with a pragmatic message. An illustration expert (speak to TSU) would be able to depict the different elements is a visually appealing style that could quickly grasp the readers interest and attention. Further more, the data could be complemented with information on the strategies for reducing vulnerability and exposure (see Cross-Chapter Box 1, Figure 1) - with this, the SROCC may end up with a powerful figure for the SPM. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted. We have dropped the table and created a figure as part of the new box on response types.
9645	4	91	11	91	11	There is no table 4.6; this table, references to it, and subsequent tables should be renumbered. [Government of France, France]	Accepted. Text revised.
20169	4	91	11	91	11	Table gives a nice overview but is visually not attractive. Using colours could make it easier to quickly read it. [APECS Group Review, Germany]	Accepted. We have dropped the table and created a figure as part of the new box on response types.
20171	4	91	11	91	11	The explanation of table 4.7 comes after the table. Wouldn't it be better for the flow and understanding that the table comes after the explanations? [APECS Group Review, Germany]	Accepted. We have dropped the table and created a figure as part of the new box on response types.
31239	4	91	11	91	11	Table 4.7 gives a very useful overview, but is somewhat confusing from a graphic perspective – may convert it to a figure with a simply and easy to follow design. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted. We have dropped the table and created a figure as part of the new box on response types.
3805	4	91	11	92	1	As same as previous comments, I think "Advance" and "land reclamation" can be categorized in Protection or Accommodation of adaptations. [Makoto Tamura, Japan]	Rejected. Yes, this is possible, but there is no unique way of categorizing all coastal responses. We decided to include advance because it has been around in the literature for a long time and is opposite to retreat.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3037	4	91	11	92	2	This table could mention that some measures that address a particular phenomenon can create other problems. For example, sea walls are intended to protect against flooding but they usually cause scouring and erosion. [Goneri Le Cozannet, France]	Accepted. We have a subsection on this for each type of response.
22159	4	92	0	111	0	"The section provides comprehensive analysis of the cost and benefits of undertaking adaptation-related actions to address the impacts of sea level rise. This section could be strengthened by adding analysis on the available sources of funding including innovative mechanisms to meet the adapation costs." [NAYANIKA SINGH, India]	Rejected. While this would be indeed nice, we don't have more space to address this in the chapter.
25679	4	92	0	111	0	"The section on cost and benefits for undertaking adaptation actions could inculde information on the available sources of funding including innovative mechanisms." [Government of India, India]	Rejected. While this would be indeed nice, we don't have more space to address this in the chapter.
32053	4	92	1	82	1	Should 'setback zones' not be categorised as 'retreat'? [Marjolijn Haasnoot, Netherlands]	Rejected. Yes, this is possible, but there is no unique way of categorizing all coastal responses. The literature is ambigious.
24107	4	92	3	110	4	This chapter should elaborate on depolderization/managed realignment techniques, which emerged as promising solutions to mitigate coastal flooding over the last decade. See e.g. :Esteves, L.S., 2013. Is managed realignment a sustainable long-term coastal management approach? Journal of Coastal Research, SI 65, 933-938. DOI: 10.2112/SI65-158 Goeldner-Gianella, L., 2007. De-polderizing in Western Europe, 2007. Annales de Geographie, 116 (656), 339-360. Townend, I., Pethick, J., 2002. Estuarine flooding and managed retreat. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 360 (1796), 1477-1495. Huguet, J.-R., Bertin, X., Arnaud, G., 2018. Managed realignment to mitigate storm-induced flooding: A case study in La Faute-sur-mer, France. Coastal Engineering 134, pp. 168-176. [Sylvain Ouillon, France]	Accepted - we have a subsection on retreat that covers managed realignment and includes some of these references.
31241	4	92	14	92	23	Suggest to merge points 3 and 6 on economic dimensions for this whole section. This structure otherwise suggests an overemphasis on economic aspects. Also, for some of the response options there is a lack of data on economic efficiency or costs. Hence, distinct sections are not really necessary. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - These points are about distinct aspects. Point 3 covers only the direct cost of measures and not the “economic cost” and we now have reworded this acordingly.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3807	4	92	22	92	23	You can refer to Tamura et al.(2019) which evaluated effectiveness of adaptation in global coastal areas based on RCP/SSP scenarios. According to study results, dikes 1 m in height may reduce the total inundated area by approximately 40% below the no-adaptation baseline under the same RCP. It was found that the incremental adaptation cost was less than the economic damage in almost all cases of RCP/SSP, providing an incentive to take action to respond to climate change. Tamura,M., M.Yotsukuri, N.Kumano, H.Yokoki(2019) "Global assessment of the effectiveness of adaptation in coastal areas based on RCP/SSP scenarios," Climatic Change, (in press). https://rdcu.be/bfxp9 [Makoto Tamura, Japan]	Accepted - citation included
5415	4	93	0	98		There are two tables numbered 4.8, on page 93/94 and page 98 [Michelle North, South Africa]	Editorial – copyedit to be completed prior to publication
9153	4	93	1	0		Suggest replacing "build" with "built" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6639	4	93	2	0		Change "provides" to singular [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
10365	4	93	2	93	2	The seawall around Male (Maldives)this is not built or designed for tsunami protection but it did provide some degree of protection during 2004 Tsunami [Mahmood Riyaz, Maldives]	Accepted - sentence was removed.
20173	4	93	6	93	7	I would add in remaining information where the given reference also says that 28% beaches are accreting and 48% are stable. [APECS Group Review, Germany]	Rejected - this piece of information is nor relevant for the point we are making.
6641	4	93	8	0		Suggest replace "to" with "with" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
10367	4	93	13	93	17	Why not give examples from small islands? [Mahmood Riyaz, Maldives]	Taken into account - unfortunatly we did not find a paper describing such as case
6643	4	93	21	0		Suggest insert "in" after "commissioned" [Nina Hunter, South Africa]	Accepted - text revised
14005	4	93	25	93	34	Please explain 'Discount rates'. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted. Discount rate is now explained in the glossary
6645	4	93	33	0		Remove "one" after "ratios" [Nina Hunter, South Africa]	Accepted - text revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
804	4	93	36	94	18	Section 4.4.3.1.4 is lacking reference to “Costs of sea dikes – regressions and uncertainty estimates” (Lenk, S., et al. doi.org/10.5194/nhess-17-765-2017 , 2017). This work updates and supplements the work by Jonkman 2013. On the one hand, it is found that the uni-cost assumption is a valid one (the costs for 2km protection of 1m height are statistically the same as 1km of 2m height). The authors describe considerable uncertainty employing log-normal distributions and estimate that the range between 3x and x/3 contains 95% of the data, where x represents the corresponding unit costs. On the other hand, a range of uni-costs are listed in the paper. [Diego Rybski, Germany]	Accepted - citation included
3809	4	93	41	93	43	Tamura et al.(2019) also examined the design standards of coastal defenses such as sea dikes and constructed a database of the unit costs of 455 sites from 20 countries. https://rdcu.be/bfxp9 [Makoto Tamura, Japan]	Accepted - citation added.
6647	4	93	48	0		Suggest changing "are" to "will be" [Nina Hunter, South Africa]	Accepted - text revised
4819	4	93	51	0		Could the word 'bespoke' be replaced to clarify exactly what is meant? [Debra Roberts and Durban Team, South Africa]	Accepted - text revised
31391	4	93	55	0		Some of this would provide important orientation in the ES and possibly SPM. [Hans-Otto Poertner and WGII TSU, Germany]	Noted
3811	4	93	55	94	1	Tamura et al.(2019) and their Supplementary Materials also examined the design standards of coastal defenses such as sea dikes and constructed a database of the unit costs of 455 sites from 20 countries. [Makoto Tamura, Japan]	Accepted - citation added.
4821	4	94	0	0		Table: in Storm Surge Barrier, please convert Euro to USD [Debra Roberts and Durban Team, South Africa]	Rejected - this is not possible as the authors don't report for which year the value is stated.
24163	4	94	1	102	23	4 quotations of Linham and Nicholls 2010 to be changed into Zhu et al 2010 (Zhu, X, Linham, MM & Nicholls, RJ 2010, Technologies for Climate Change Adaptation - Coastal Erosion and Flooding. TNA Guidebook Series, Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi, Roskilde, Denmark) [Sylvain Ouillon, France]	While Zhu is the editor, Linham, MM & Nicholls are the authors of the numbers we are citing.
10369	4	94	3	94	18	Specific case of low lying islands are no taddressed in this important issue [Mahmood Riyaz, Maldives]	Taken into account. Unfortuntly, there are to our knowledge no unit cost estimates available specifically for small islands
6649	4	94	11	0		Replace "later" with "latter" [Nina Hunter, South Africa]	Accepted - text revised
30455	4	94	14	94	15	One essential component to optimize maintenance and reduce costs is regular beach and shoreface monitoring to assess the beach volume, possibly in strict connection with the monitoring of environmental parameters. [Michele Capobianco, Italy]	Accepted - text revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21841	4	94	26	94	28	Rising groundwater tables in historical reclamation areas (which generally used coarse fill material) and sandy areas with groundwater bodies, also can also render hard or soft protection ineffectual. Both occur in several areas of NZ incl. major urban areas - so not just limestone substrates. [Robert Bell, New Zealand]	Accepted -sentence added on this.
12019	4	94	30	0		Revetment expected to reduce EAD by 30% in the Marshall Islands: Giardino et al (https://link.springer.com/content/pdf/10.1007%2Fs10113-018-1353-3.pdf) [Michail Vousdoukas, Italy]	Taken into account - due to the need to shorten text, we did not take this on board.
27071	4	94	32	0		In the paragraph that starts at line 32, consider pointing out that there is a risk associated with solely relying on hard protection, especially if it is the only line of defense. If it fails it may have catastrophic consequences, as witness with Katrina. [Kees Lokman, Canada]	Taken into account - this is mentioned in the next subsection
30457	4	94	32	94	33	Maintaining this effectiveness over time requires regular monitoring and maintenance, accounting for changing conditions such as sea level rise, and promt identification of significant erosional events and widespread erosional trends in front of the defences. [Michele Capobianco, Italy]	Rejected - due to a lack of space
6651	4	94	39	0		Suggest inserting "an" before "urban" [Nina Hunter, South Africa]	Accepted - text revised
6653	4	94	44	0		Change "consequence" to "consequences" [Nina Hunter, South Africa]	Accepted - text revised
31243	4	94	44	95	1	Please provide more recent evidence on the adverse affects of hard protection measures. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - we have done so.
21843	4	94	44	95	8	Another emerging adverse effect of hard protection of existing shoreline in estuaries and tidal creeks flanked by gently sloping margins, is the increase in tidal range compared to present e.g. see comment in row 39 of my comments and REF: Lee et al. (2017). Impact of sea level rise on tidal range in Chesapeake and Delaware Bays. JGR-Oceans. doi:10.1002/2016JC012597 [Robert Bell, New Zealand]	Accepted - citation added.
4823	4	95	2	0		Here or else on pg 102: "loss of habitat" - it would be good to see a little more emphasis here on the catastrophic effect hard structures can have on local ecosystems and local livelihoods, eg the Saemangeum Land Reclamation in Korea - Is this an example of the rich benefiting again while the poor get poorer? Same comment applies to 4.4.3.3.6&7 [Debra Roberts and Durban Team, South Africa]	Accepted - we have added this under section "4.4.3.4.5 Co-benefits and drawbacks of advance", where land reclamation is coverd.
20175	4	95	10	95	10	The paragraph starts with just one cobenifit and then it continues with the negative impacts. I would suggest to move the cobenifits in the top most paragraph of this section. This way advantages and disadvantages will be separately discussed. [APECS Group Review, Germany]	Accepted - text revised
6655	4	95	14	0		Change "to" to "for" [Nina Hunter, South Africa]	Accepted - text revised
6657	4	95	15	0		Change "considerations" to "consideration" [Nina Hunter, South Africa]	Accepted - text revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21845	4	95	16	95	20	Scarcity of beach material is mentioned but an allied issue for communities that can't afford concrete seawalls is the increasing scarcity of suitable rock material (composition and size) for building rock revetments/dikes [Robert Bell, New Zealand]	Taken into account - we did not find a suitable reference for this.
6659	4	95	17	0		Change "of" to "for" [Nina Hunter, South Africa]	Accepted - text revised
10371	4	95	17	95	20	beach material scarcity is an important issue for low lying atoll islands [Mahmood Riyaz, Maldives]	Noted
6661	4	95	18	95	20	Suggest removing "challenges" and inserting "makes" in its place; insert "challenging" after "rise" [Nina Hunter, South Africa]	Accepted - text revised
3813	4	95	23	95	26	You can refer to Tamura et al.(2019) which evaluated effectiveness of adaptation in global coastal areas based on RCP/SSP scenarios. According to study results, dikes 1 m in height may reduce the total inundated area by approximately 40% below the no-adaptation baseline under the same RCP. It was found that the incremental adaptation cost was less than the economic damage in almost all cases of RCP/SSP, providing an incentive to take action to respond to climate change. Tamura,M., M.Yotsukuri, N.Kumano, H.Yokoki(2019) "Global assessment of the effectiveness of adaptation in coastal areas based on RCP/SSP scenarios," Climatic Change, (in press). https://rdcu.be/bfxp9 [Makoto Tamura, Japan]	Accepted -reference included
806	4	95	23	95	44	Section 4.4.3.1.6 is lacking reference to “Quantifying the effect of sea level rise and flood defence – a point process perspective on coastal flood damage” (Boettle, M., et al., doi.org/10.5194/nhess-16-559-2016 , 2016), see also commont on Section 4.3.3.2.2. The authors derive that full flood safety can only be achieved for Weibull distributed extreme sea-levels. In addition, it is shown that the relative uncertainty of residual loss grows with increasing protection level. This work is particularly important since the approach is complementary to the other referenced publications. In contrast to “number-crunching” it is based on pure math. [Diego Rybski, Germany]	Rejected - the paper does not assess economic efficency of adapation, which is the theme of this subsection.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21847	4	95	23	95	44	These paragraphs on what "makes economic sense" is narrowly constrained to direct financial costs versus damage saved. There are also direct ecosystem and environmental consequences and losses e.g. loss of beach amenity (which maybe why the town or resort exists for) and coastal squeeze on tidal wetlands, marshes etc that are not "costed" plus cultural/indigenous preferences or conflicting values. There are also policy and planning restrictions or prohibitions on hard protection measures that some jurisdictions have. At least some mention of the other 2 aspects (social, environmental) of triple bottom line considerations is needed to balance the financial consideration, plus the rising residual risk (failure, breaches) otherwise to a decision-making this reads like a blanket endorsement to harden the coastline. [Robert Bell, New Zealand]	Accepted - text has been revised
31393	4	95	28	0	33	To be considered among key quantitative highlights for adaptation reducing risks? [Hans-Otto Poertner and WGII TSU, Germany]	Noted
6663	4	95	28	0		Change "find" to "finds" [Nina Hunter, South Africa]	Accepted - text revised
6665	4	95	31	0		Suggest insert "the" before "global" [Nina Hunter, South Africa]	Accepted - text revised
10375	4	95	35	95	44	"generally makes economic sense to continue to protect existing urban areas by hard defences" this can be considered as unfavouring protection of rurual areas? [Mahmood Riyaz, Maldives]	Accepted - sentence has been droped
16403	4	95	38	95	39	The assessment in these subsections seems to suffer from a citation bias towards Hinkel et al 2018. Please balance with other studies! [Alexander Nauels, Germany]	Accepted - text revised
6667	4	95	39	0		Move "specifically" to after "question" [Nina Hunter, South Africa]	Accepted - text revised
31395	4	95	41	0	44	To be considered among key quantitative highlights for adaptation reducing risks? [Hans-Otto Poertner and WGII TSU, Germany]	Noted
10373	4	95	41	95	41	dekete "it" after coast [Mahmood Riyaz, Maldives]	Accepted - text revised
22025	4	96	1	96	1	Benefit ocst ratios of doing WHAT? Figrues and their captions should be interpretable on a standalone basis, but this one is not clear at all? [David Schoeman, Australia]	Accepted - text revised
15089	4	96	2	96	3	What is meant by 6% discount rates for the SSPs? Please avoid abbreviation (SSP) in figure caption. [Government of Germany, Germany]	Accepted - text revised
21849	4	96	8	96	20	A review of coastal adapation across New Zealand has synthesized a number of conflicting values and barriers/enablers , including indigenous values, that need to be resolved through the governance arrangements Ref: Rouse et al (2016) - see row 40 of my comments [Robert Bell, New Zealand]	Taken into account - due to a lack of space we have not added this references
9647	4	96	16	96	17	A verb is missing and the whole meaning of the sentence is unclear. [Government of France, France]	Accepted - text revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31245	4	96	18	96	20	Suggest to add a specific example, such as Comoros: Ratter, B. M. W., J. Petzold and K. M. Sinane, 2016: Considering the locals: coastal construction and destruction in times of climate change on Anjouan, Comoros. Natural Resources Forum, 40 (3), 112-126, doi:10.1111/1477-8947.12102. Betzold, C. and I. Mohamed, 2016: Seawalls as a response to coastal erosion and flooding: a case study from Grande Comore, Comoros (West Indian Ocean). Regional Environmental Change, 1-11, doi:10.1007/s10113-016-1044-x. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - example added.
6669	4	96	28	0		Suggest replace "have been" with "were" [Nina Hunter, South Africa]	Accepted - text revised
10379	4	97	5	101	33	IS there any quantifiable result shows that a certain coral restoration has protected x- length of coastal area? [Mahmood Riyaz, Maldives]	Taken into account - we have added such results
6671	4	97	29	0		Remove extra "the" [Nina Hunter, South Africa]	Accepted - text revised
31397	4	97	30	0	40	This appears as important background information. [Hans-Otto Poertner and WGII TSU, Germany]	Noted
6673	4	97	31	0		"about" not necessary as approximation sign sufficient [Nina Hunter, South Africa]	Accepted - text revised
6675	4	97	33	0		Insert "of" after "because" [Nina Hunter, South Africa]	Accepted - text revised
6677	4	97	34	0		Change "an" into "and" [Nina Hunter, South Africa]	Accepted - text revised
3815	4	97	34	97	35	According to the World Atlas of Mangroves (2010), the area covered by mangroves globally is 152,360 km2 in over 123 countries and territories of the tropics and subtropics. You can refer to TroCEP(Tropical Coastal Ecosystems Portal) as a mangrove distribution database; http://www.nies.go.jp/TroCEP/. [Makoto Tamura, Japan]	Accepted - reference added
20177	4	97	37	97	38	Salt marshes are present in high latitudinal, arctic and subarctic areas (information can be added, since occurence of Mangrooves is given in lines above). [APECS Group Review, Germany]	Accepted - text revised
6679	4	97	42	0		Change "they" to "it" [Nina Hunter, South Africa]	Accepted - text revised
6681	4	97	44	0		Insert "The" before "Main" [Nina Hunter, South Africa]	Accepted - text revised
6683	4	97	48	0		Replace "is" with "are a" [Nina Hunter, South Africa]	Accepted - text revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4825	4	97	50	97	54	Is the inherent value of natural ecosystems included here? The "relative novelty" is only a matter of us recognising their value, as opposed to the value itself. Natural ecosystems have always supported and protected human life. We keep taking them for granted, and only as we have destroyed them, have we felt their loss. Do you see in the literature an increasing financial accounting of the value of natural systems? Size of economic benefit of EbA. We have only realised how valuable they are in their absence. Cost of restoring what is lost is not a good indicator of value. One needs to compare the damage in areas that have natural, undamaged ecosystems protecting the shoreline vs those that do not. This comes out in p100:15-23, and perhaps needs to be emphasised a bit more clearly. [Debra Roberts and Durban Team, South Africa]	Accepted - we have revised the text emphasizing these points.
4827	4	98	0	0		Table: move global sites to the top and regional/local sites (eg US only) to bottom of table. [Debra Roberts and Durban Team, South Africa]	Accepted - table revised
6689	4	98	0	0		Replace "database allows to explore" with "database allows for the exploration of"; change "included" to "includes"; change "allows to" to "provides the option to" [Nina Hunter, South Africa]	Accepted - text revised
6691	4	98	0	0		Replace "helps to learn" with "enables the learning of" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6685	4	98	2	0		Was "adaptation" intended, instead of "adaption"? [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6687	4	98	2	98	6	"accomodation" should be "accommodation" [Nina Hunter, South Africa]	Accepted - text revised
27073	4	98	10	0		Consider adding Green Shores to Table 4.8: http://stewardshipcentrebc.ca/Green_shores/ "Green Shores provides options and tools for a wide range of planning, design and construction professionals and landowners who are interested in minimizing the environmental impacts of their projects in a cost effective manner. For home owners and communities, the stories, resources and examples presented here can inspire you to make choices that will be beneficial to everyone in the long term." [Kees Lokman, Canada]	Accepted - text revised (table was amended)
15091	4	98	10	98	10	Please consider to write out Ecosystem-based Adaptation instead of using acronym EbA [Government of Germany, Germany]	Rejected - we use this term a lot and hence it is advantageous to use the acronymn
3817	4	98	10	99	1	You can refer to TroCEP(Tropical Coastal Ecosystems Portal) as a mangrove distribution database; http://www.nies.go.jp/TroCEP/. It contains world distribution maps, plant species lists and ecosystem functions. It is helpful for EbA planning. [Makoto Tamura, Japan]	Rejected - while it is true that this database would be helpful, the table rather focusses on databases featuring EbA measures
6693	4	99	3	0		Change "is" to "are" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31399	4	99	11	0	15	This assessment of solution options should be more prominent in the presentation and the ES. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted
6695	4	99	13	0		Change "challanges" to "challenges" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6697	4	99	14	0		Suggest replace semi-colon with comma [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
14007	4	99	15	99	15	Grey measures' are mentioned here but have not previously been discussed. What does this refer to? This should be set out in a consistent way to other areas of the report. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - we now don't use grey measures anymore
31247	4	99	15	99	15	Suggest to avoid the term 'grey measures', which is not used in this report, and might be confusing. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - we now don't use grey measures anymore
2205	4	99	19	0		Based on their NCs submitted to the UNFCCC, more than 30 SIDS cite EBA with mangrove planting as the most common measure to address future SLR (Wong, 2018). Wong, P.P., 2018. Coastal protection measures – case of small island developing states to address sea-level rise. Asian Journal of Environment and Ecology, 6 (3): 1-14. [Poh Poh Wong, Singapore]	Accepted - citation added.
6699	4	99	19	0		Change "extend" to "extent" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
8553	4	99	24	99	24	Worth emphasizing the point that maintenance costs for restored / created wetlands are largely unknown as such schemes have not been in place for long enough to obtain meaningful figures [Thomas Spencer, United Kingdom (of Great Britain and Northern Ireland)]	The point about uncertain costs of EbA is now made several times.
31401	4	99	27	0	37	This assessment of solution options and associated costs should be more prominent in the presentation and the ES. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - we have added ES statements on this
29949	4	99	32	99	32	opportunity costs for whom/what? [Anna Zivian, United States of America]	Accepted - text revised
9649	4	99	32	99	33	Opportunity costs for whom/what, in which direction? [Government of France, France]	Accepted - text revised
6701	4	99	34	0		Change "ecosystem" to "ecosystems" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6703	4	99	35	0		Change "mangroves" to "mangrove"; add "of" before "corals" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
10381	4	99	50	100	1	Despite the large amount of coral reef conservation project ongoing no costs??? [Mahmood Riyaz, Maldives]	Taken into account - By definition, there are no capital costs for conservation - all costs of conservation are recurring and hence maintenance cost - same for wetlands in the first row ...
6707	4	100	9	0		Suggest add "and" before "submerged" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6705	4	100	12	0		"10s" may be better stated as "tens" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6709	4	101	1	0		Change "perform" to "performs" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
10377	4	101	1	101	2	"In contrast, a reef restoration project that uses submerged concrete 1 structures perform as a breakwater as soon as the sub-structure is in place" it is the concrete structure that is performing not the reef or coral on it [Mahmood Riyaz, Maldives]	Accepted - we consider the whole project (structure + corals)
27075	4	101	4	0		Replace negative consequences with drawbacks: Co-benefits and drawbacks of ecosystem-based protection [Kees Lokman, Canada]	Accepted - text revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
4829	4	101	6	0		It seems a bit strange that tourism is mentioned before fisheries, food and other more fundamental benefits, even if it is the main export of many developing nations. [Debra Roberts and Durban Team, South Africa]	Taken into account - We were refering to coastl fisheries and have now added “coastal”
4831	4	101	14	0		This sentence seems strange: saying that a benefit of ecosystem-based measures is that they do not harm ecosystems. That's like saying "the benefit of child protection is that it does not harm children" - that misses the point. Or is this referring to the benefits of EbA contrasted with alternative such as novel anthropogenic ecosystem-equivalents or replacements, or well-meant human interventions that may actually harm? Surely the greatest benefit of EbA is that it preserves and attempts to restore the very ecosystems that our existence - and those of other life forms - depend on, and which also end up protecting our assets just by being there as a wall of defence. [Debra Roberts and Durban Team, South Africa]	Accepted - we have removed this sentence
4833	4	101	18	0		"drawbacks of EbA is space required" - again, that is like saying the drawback of land use is that it takes up space. The problem / challenge is the competition for land, the perceived needs, the perceived value of things, the perceived costs and benefits, the way decisions are made, etc, not the fact that things take up space.It is strange not to see mention of competition for land in section 4.4.3.5 [Debra Roberts and Durban Team, South Africa]	Taken into account - Text revised and the competition for land is now mentioned in the same sentence.
29951	4	101	19	101	19	not correct section reference [Anna Zivian, United States of America]	Accepted - reference revised
25681	4	101	39	101	42	India's Coastal Regulation Zone (CRZ) Notification, 2018 (and its earlier versions) has an important component towards EbA in the form of protection accorded to EcoSensiveAreas (ESA). This reference could be mentioned here. [Government of India, India]	Accepted - we have included reference to this.
6711	4	101	45	0		Suggest replace "like" with "as" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
14009	4	101	48	101	51	It is not clear who the FEMA regulations allows to take into account co-benefits (is it FEMA itself?). It would be useful to clarify this. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - we have clarified this.
6713	4	101	49	101	50	Suggest rephrase "allows…projects" by removing "to take into account" and insert "to be taken into account" after "projects" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6715	4	101	51	0		Replace "is" with "are" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6727	4	101	55	0		A brief definition of "advance" would be helpful [Nina Hunter, South Africa]	Accepted - definition given in at the beginning of the section.
31249	4	101	55	0		This section has no use of confidence language – Confidence/uncertainty statements can be used also in cases of low confidence or limited evidence, as for some aspects of ‘advance’ [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - text revised
32623	4	101	55	101	55	suggest a more descriptive title than "Advance"; perhaps "Advances in/Advancing coastal land area" [Kim Cobb, United States of America]	Rejected - we rather stick to the common use of this term in the literature

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6717	4	102	6	0		Suggest change "flat" to "flats"? [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
12089	4	102	7	102	7	“Hong Kong”is changed to“Hong Kong Special Administrative Region of China”。 [Government of China, China]	Accepted -text revised
6719	4	102	13	0		Change "are" to "is" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6721	4	102	15	0		Change "call" to "called" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6723	4	102	36	0		Change "risks" to "risk" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
27077	4	102	38	0		Replace negative consequences with drawbacks: Co-benefits and drawbacks of advance [Kees Lokman, Canada]	Accepted - text revised
6725	4	102	42	0		Change "impact" to plural [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
9919	4	102	53	102	57	Explain better governance of advance [Úrsula Oswald Spring, Mexico]	Taken into account - unfortuntaly there is no literture on this
6729	4	102	55	0		Replace "to" with "with" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
32625	4	103	1	103	1	again, suggest a more descriptive heading here; I note that "retreat" is more self-explanatory than the "advance" or "accomodation" categories [Kim Cobb, United States of America]	Rejected - we rather stick to the common use of this term in the literature
21853	4	103	1	104	49	This whole section is about private assets/buildings and no mention whatever about services and infrastructure.Ports, having a functional need to be at the coast, will need to accommodate SLR by raising wharves and facilities, roads can be raised or bridged, stormwater and wastewater pipes and systems upgraded etc. Needs text around adpatation approaches for infrastructure. A good guidance manual to hinge it on is: Ref: Ayyub, B.M (Ed) 2018. Climate-resilient Infrastructure - Adaptive Design and Risk Management, ASCE Manuals on Engineering Practice, No. 140, ASCE, https://doi.org/10.1061/9780784415191 [Robert Bell, New Zealand]	Accepted - text revised (ports were added)
6731	4	103	3	0		Replace "aiming" with "aimed" [Nina Hunter, South Africa]	Text was removed
6733	4	103	5	0		"occurance" should be "occurrence"; insert "the" before "following" [Nina Hunter, South Africa]	Text was removed
2207	4	103	5	103	9	Should include floating houses considering that floating gardens (lines 38-39) and experimental floating/amphibious houses (line 43) are mentioned here. More focus should be given to well established and traditional settlements in a number of coastal areas in Asia, e.g. Vietnam (Nguyen, 2017). Nguyen, T.T.T., 2017. Architectural approaches to a sustainable community with floating housing units adapting to climate change and sea level rise in Vietnam. In Stopp, H. and P. Strangfeld (eds), Floating Architecture: Construction On and Near Water, LIT Verlag Münster, Berlin, p. 21-32. [Poh Poh Wong, Singapore]	Accepted - references was added
6735	4	103	6	0		Change "has" to "have"; sentence "physical ... shelfs" is very long and difficult to read - please make clearer. [Nina Hunter, South Africa]	Text was removed

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21851	4	103	6	103	7	Accommodation: besides building regulation and codes, an important lever is land-use planning controls or setbacks which limit what further, if any, development can occur. So controls on both buildings and land-usage are important as a combination [Robert Bell, New Zealand]	Taken into account - text revised
9143	4	103	11	0		Change "include" to "includes"; "systms" to "systems" [Nina Hunter, South Africa]	Text was removed
2209	4	103	12	0		“Rice fields” or “paddy fields” and not “rice paddies” (paddy [Malay] = rice). Correct usage in British geographical texts (e.g. by E.H.G. Dobby, L.D. Stamp). Unfortunately, American media got it wrong during the Vietnam war. [Poh Poh Wong, Singapore]	Text was removed
6737	4	103	12	0		Should "froms" be "forms"?; consider words other than "such as" - repetitive [Nina Hunter, South Africa]	Text was removed
6739	4	103	14	103	19	"system" change to "systems" [Nina Hunter, South Africa]	Accepted - text revised
31251	4	103	17	103	24	Suggest to move this synthesis to the end of this sub-section, so that it is clearer which evidence these statements are based on. Alternatively, add references to the synthesis statements. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - text revised
6741	4	103	20	103	22	Change "accommodation" to correct spelling [Nina Hunter, South Africa]	Accepted - text revised
10383	4	103	21	103	24	Is this because people are still not beleiving SLR? What might be the reason?? [Mahmood Riyaz, Maldives]	Human systems in the coastal zone are exposed to high levels of coastal risk today and are experiencing the impacts of a variety of many coastal hazards that will be exacerbated through sea-level rise. Few of these impacts can be attributed alread today to current sea-level rise.
4835	4	103	22	0	24	In several places in this chapter sea level rise in the context of human response is treated separately from coastal flooding. This does not make much sense. Sea level rise is a problem because it causes inundation and communities will always respond to the risk of inundation and not to sea level rise per se. It does not seem necessary to say there is "low evidence of accommodation occurring directly as a consequence of sea level rise" - it is stating the obvious. [Debra Roberts and Durban Team, South Africa]	Taken into account. Coastal flooding today is in many cases not mainly driven by SLR. Thus, many of the already implemented protection or accommodation measures respond to coastal flooding but not necessarily in the context of current or projected SLR. We take care to clarify if we address today´s conditions or future projections.
6743	4	103	28	0		Change "vulnerably" to "vulnerable" [Nina Hunter, South Africa]	Accepted - text revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3819	4	103	33	103	34	You can refer to Ling et al.(2015) which examined residents adaptation to flooding in three provinces of the Mekong Delta, Vietnam. Ling et al.(2015) suggested varying degrees of coping with seasonal flooding by raising the ground floors of their homes but their capacity to prepare for extreme floods was limited in spite of the residents' awareness of the changing dynamics of natural disasters in their locality. Ling,F.H., M.Tamura, K.Yasuhara, K.Ajima, V.C.Trinh(2015) "Reducing Flood Risks in Rural Households: Survey of Perception and Adaptation in the Mekong Delta," Climatic Change, 132(2), pp.209-222. [Makoto Tamura, Japan]	Accepted - text revised
6745	4	103	35	0		Change "relies" to "rely" [Nina Hunter, South Africa]	Accepted - text revised
4837	4	103	38	0		"flooting"? Flooding/floating? [Debra Roberts and Durban Team, South Africa]	Accepted - text revised
6747	4	103	38	0		Replace "of" with "on"; change "flooting" to "floating" [Nina Hunter, South Africa]	Accepted - text revised
6749	4	103	43	0		Replace "capable to adapt" with "capable of adapting" [Nina Hunter, South Africa]	Accepted - text revised
6751	4	103	44	0		Change "conciderations" to "considerations"; move "also" to before "discussed" [Nina Hunter, South Africa]	Accepted - text revised
6753	4	103	46	0		Change "making" to "makes" [Nina Hunter, South Africa]	Accepted - text revised
6755	4	103	48	0		Swop "be also" so that it reads "also be" [Nina Hunter, South Africa]	Accepted - text revised
6757	4	103	54	0		Change "descrease" to "decrease"; change "flashing" to "flushing" [Nina Hunter, South Africa]	Accepted - text revised
6759	4	103	55	0		Change "applyieng" to "applying" [Nina Hunter, South Africa]	Accepted - text revised
6761	4	103	56	0		Change "varieteies" to "varieties"; "programms" to "programmes" [Nina Hunter, South Africa]	Accepted - text revised
9651	4	104	4	104	9	In this paragraph, the CREWS (Climate Risk & Early Warning Systems) should be mentionned as an exemple. In the paragraph below, InsuResilience is mentionned linked to climate risk insurance schemes. For more info : https://www.crews-initiative.org/fr [Government of France, France]	Rejected - we rather took out the reference to InsuResilience to avoid the mention of single initiatives
20179	4	104	4	104	9	How have these early warning systems helped so far? [APECS Group Review, Germany]	Question noted - there is a paragraph on the effectivness of accomodation measures (4.4.3.5.4)
31253	4	104	4	104	9	Suggest to be specific about where Early Warning Systems are in place, and which specific hazards they deal with. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - specific hazards and locations have been added
6763	4	104	5	0		Change "proce" to "prone" [Nina Hunter, South Africa]	Accepted - text revised
6765	4	104	8	104	9	Remove "a"; "implemented in an integrated risk management" suggest "implemented as part of an integrated risk management framework" [Nina Hunter, South Africa]	Accepted - text revised
31255	4	104	11	104	22	Be more specific on how insurances increase resilience to sea level rise. Is the example of agriculture appropriate? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - text revised by adding more context. Agriculture is not necesserily the most appropiate example but this is the context where insurane have been tested.
6767	4	104	13	0		Change "have been also" to "have also been" [Nina Hunter, South Africa]	Accepted - text revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6769	4	104	15	0		Change "Counties whith" to "Countries with"; change "includes" to "include" [Nina Hunter, South Africa]	Accepted - text revised
6771	4	104	26	105	52	Check spelling of "accommodation" [Nina Hunter, South Africa]	Accepted - spelling was checked
6773	4	104	42	0		Change "hight" to "height" [Nina Hunter, South Africa]	Accepted - text revised
6775	4	104	47	0		"formaintenance" - insert space between words [Nina Hunter, South Africa]	Accepted - text revised
4839	4	104	54	0		"flashing"? Flushing? This entire section would benefit from a careful spell-check. [Debra Roberts and Durban Team, South Africa]	Text removed
27079	4	105	8	0		Replace negative consequences with drawbacks: Co-benefits and drawbacks of accommodation [Kees Lokman, Canada]	Accepted - text revised
6777	4	105	11	0		"helps to avoid to demolish or relocate" change to "helps prevent demolition or relocation of" [Nina Hunter, South Africa]	Accepted - text revised
14011	4	105	14	105	16	Is it universally true that accommodation maintains landscape connectivity and landward migration of ecosystems alongside maintenance of flood dynamics? Presumably this is entirely dependent on the accommodation method? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text revised to mention dependency on the measure implemented
6779	4	105	18	0		"structurels" and "faileour" change to "structures" and "failure" [Nina Hunter, South Africa]	Accepted - text revised
6781	4	105	20	0		"designe" change to "design" [Nina Hunter, South Africa]	Accepted - text revised
6783	4	105	26	0		change "sediments" to singular [Nina Hunter, South Africa]	Accepted - text revised
6785	4	105	28	105	29	"Particularly small businesses" change to "Small businesses in particular" [Nina Hunter, South Africa]	Accepted - text revised
20181	4	105	32	105	54	The focus in these sections is only/mostly on the United States. These two sections don't really add much to the complete story, as they are mostly examples. Maybe it's a good idea to combine the two sections and also include information on other countries? [APECS Group Review, Germany]	Accepted - text revised
6787	4	105	36	0		Choose to state either "USD" or "$" but not both [Nina Hunter, South Africa]	Accepted - text revised
6789	4	105	50	0		Insert "is" between "it" and "based" [Nina Hunter, South Africa]	Accepted - text revised
6791	4	105	53	0		"largerly" change to "largely" [Nina Hunter, South Africa]	Accepted - text revised
6793	4	105	54	0		Change "structure there" to "structures they" [Nina Hunter, South Africa]	Accepted - text revised
20183	4	105	56	105	56	Section 4.4.3.5 Retreat: Nothing is mentioned on the migration of people living on islands? [APECS Group Review, Germany]	Accepted - we now have added some cases.
31257	4	106	1	106	2	Need confidence statement and references, e.g., cross-reference to Section 4.3.3 [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - Sentence removed
6795	4	106	14	0		Change "separable" to "seperated" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
29953	4	106	19	108	51	make sure to include reference to Alaska case (Shishmaref) [Anna Zivian, United States of America]	Accepted - refernce added.
6797	4	106	20	0		Remove "a" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
31259	4	106	20	106	24	Add reference to Cross-Chapter Box 7 (Low-lying islands and coasts) [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - reference added.
14013	4	106	22	106	24	This sentence is very technical, could it be simplified? For example 'Migration interacts with a number of factors including urbanisation, landuse, environmental change and globalization, migration also links closely with development and politics'. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6799	4	106	29	0		Change "significantly suceptible to endure" to "significantly more susceptible to" (remove "endure") [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
4841	4	106	39	0		It would make sense to follow the first sentence immediately by the sentence on line 46 "There is high evidence of environmental hazards displacing people worldwide." to make it clear that the statement refers to the distinction between migration and displacement, and not to people moving out of harm's way in general - which is how the first sentence could be understood currently. [Debra Roberts and Durban Team, South Africa]	Accepted - text revised
20185	4	106	39	106	40	Is this true? Example: what about people in Svalbard that need to relocate because of permafrost? What about climate refugees? [APECS Group Review, Germany]	Taken into account - this is true but mind the terminology. Both cases are not about migration. Th first one is about relocation and the second one about displacement. See definitions.
9921	4	106	39	106	56	Without any doubt, environmental induced migration (EIM) is always a complex pattern, where demographic, socioeconomic, cultural and natural phenomena are interlinked. However, there are cases such as Mitch in Honduras, where after the landslide in the capital, thousands of people migrated to the USA. If you distinguish among low-processes such as SLR and fast ones such as hurricanes with flood and landslides you can better distinguish among EIM and its patterns. [Úrsula Oswald Spring, Mexico]	Taken into account - We distinguish between slow-onset and fast-onset hazards. Fast-onset hazards ususally lead to forced displacement as treated in the next paragraph.
27231	4	106	39	107	17	There have been both planned retreats effectuated (Carteret Islands in Pacific) and those currently in discussion (Alaskan communities with permafrost melting). Also, some places (such as island nation of Kiribati) have purchased land in other countries (Fiji) preemptively. This could be included in these sections. [Michael Schwebel, United States of America]	Accepted - we have added reference to soem of these cases.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31261	4	106	41	106	43	Add the following recent references specifically on the question whether migration is related to climate change or other pressures: Stojanov, R. et al., 2016: Local perceptions of climate change impacts and migration patterns in Malé, Maldives. The Geographical Journal, doi:10.1111/geoj.12177. Perumal, N., 2018: “The Place Where I Live Is Where I Belong”: The Question of Climate-Related Migration in Vanuatu. Island Studies Journal, 13 (1), 45-64, doi:10.24043/isj.50. Marino, E. and H. Lazrus, 2015: Migration or Forced Displacement?: The Complex Choices of Climate Change and Disaster Migrants in Shishmaref, Alaska and Nanumea, Tuvalu. Human Organization, 74 (4), 341-350, doi:10.17730/0018-7259-74.4.341. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - refernces added.
6801	4	106	47	0		Insert "were displaced" after "18 million" [Nina Hunter, South Africa]	Accepted - text revised
14015	4	106	50	52	106	Does the reference to labour needs imply that the Government find work for displaced individuals? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - no. The sentence ment to say that resettlement is done to places where lable demand is high. The sentence now has been revised.
22527	4	106	53	106	56	It should be noted that the Immigration and Protection Tribunal of New Zealand has heard two cases testing climate refugee arguments from Tuvaluan and i-Kiribati applicants, both citing negative environmental change on their home islands as grounds for remaining in New Zealand. One applicant was successful in the quest to remain in New Zealand on humanitarian grounds, but not on the grounds of refugee status. Farbotko, C., Stratford, E. and Lazrus, H. (2016) ‘Climate migrants and new identities? The geopolitics of embracing or rejecting mobility’ Social & Cultural Geography 17(4):533-552. [Government of Australia, Australia]	Accepted - we have included this example.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32577	4	106	53	106	56	I belive that this text is not correct. “Direct evidence of population movement occurring in response to climate change, however, remains controversial. In the case of small islands for example, the AR5 specifies that ‘evidence of human mobility as a response to climate change is scarce [and] there is no evidence of any government policy that allow for climate “refugees” from islands to be accepted into another country’ (Nurse et al., 2014, p. 1625).” Firtly, there is evidence if the displacement or resettlement in some islands in Pacific. This is inconsistent with 1st paragraph in the page. Secondly there is any development with the category “climate refugees” (different name) in New Zealand. In the context I suggest to upgrade the information in the report on the topic. I am happy to do it, if you need any assistance. [Robert Stojanov, Czech Republic]	Accepted - we have deleted these sentences and insteas report on sveral cases where evidence is avialble
31263	4	106	54	106	56	Is there no other, more recent literature on policies/governance regarding climate refugees since AR5? If so, this would be worth noting explicitly. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - we have included more recent literture.
16405	4	107	1	107	13	Most of the paragraph covers planned relocation in areas of the developed word. Please expand this assessment with more information on the developing world if available. [Alexander Nauels, Germany]	Accepted - developed world cases have been added.
6803	4	107	9	0		Insert "the" before "Xynthia" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
14017	4	107	15	107	15	This should refer to 'Coastal Pathfinders' rather than 'Change Pathfinders'. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - sentence has been removed due to lack of space.
16407	4	107	20	107	22	Is this assessment, the "will persist" in particular, not at odds with the information provided in the pervious subsection on observed retreat, in particular with p106 l39? [Alexander Nauels, Germany]	Accepted - sentence removed.
6805	4	107	28	107	29	Move "on migration" to after "climate change" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
31265	4	107	30	107	31	‘Perch-Nielsen et al., 2008’ is not a reference to AR5. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - sentence removed.
14019	4	108	2	108	7	Does this framework account for population change? Please clarify in text. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	We assume the reviewer is asking whether this framework accounts for population change in the sense of demographic factors other than migration. The answer is that it is able to do so but that in some applications, static background population is assumed as a baseline. Since the reference in this sentence has been changed to an earlier one that describes the general properties of such a model and results of particular applications to sea level rise are not reported, we feel that this level of detail is not appropriate.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31403	4	108	4	0	9	Such insight into the magnitde of change is important and may need to be highlighted in ES. [Hans-Otto Poertner and WGII TSU, Germany]	The original Desmet et al reference has been replaced because it will not complete review by the May 15 deadline. The new Desmet et al reference in its place does not report specific values related to sea level rise so there is not sufficient speciic information to promote this to the ES.
31267	4	108	9	108	9	It is not clear which part of the assessment this confidence statement relates to. [Hans-Otto Poertner and WGII TSU, Germany]	Confidence statement has been removed.
6807	4	108	11	0		Replace "in" with "who" [Nina Hunter, South Africa]	Copy edit accepted
31269	4	108	26	0		So far, this section only deals with costs of planned relocation. What about the individual costs of displacement? Or costs related to migration? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - we added some numbers on displacement and migration cost
9653	4	108	26	108	26	The case of Shishmaref, Alaska, would be useful to include here in addition to the discussion of the Isle de Jean Charles in Louisiana. [Government of France, France]	Taken into account - unfortuntly we did not find any referenec on these costs.
14021	4	108	27	108	34	The maintenance cost of economic retreat will entirely depend on people moving inland far enough to remove the risk. In some cases people may only be moved by an amount which reduces short term but not long term risk (which then might require other options such as protection). [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - text included.
31405	4	108	36	0	44	Such insight into the magnitude of cost is important and may need to be highlighted in ES. [Hans-Otto Poertner and WGII TSU, Germany]	Noted.
14023	4	108	36	108	39	The costs for the UK seem low and most examples from the UK do not include relocation of people but focus on managed realignment with a focus on habitat recreation and reduction in flood risk (examples with costs available include the Medmerry realignment (e.g. https://www.ice.org.uk/knowledge-and-resources/case-studies/managed-realignment-at-medmerry-sussex) . [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - tehse were minimum cost for the UK. We now include the full range given in the final DEFRA report: Regeneris Consulting, 2011. Coastal Pathfinder Evaluation: An Assessment of the Five Largest Pathfinder Projects. Department of Environment, Food & Rural Affairs.
6809	4	108	38	108	49	Choose to state either "USD" or "$" but not both [Nina Hunter, South Africa]	Rejected - unfortuntly we cannot convert as the authors don't provide the time for which prices are given.
6811	4	108	45	0		Remove "The" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6813	4	108	49	0		Remove "to settle 100 households" - repetition [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
10391	4	108	54	108	56	How is retreat going to work in small island where there is no space ? May adress this [Mahmood Riyaz, Maldives]	Taken into account - see section on "advance"
6815	4	108	55	0		"reterat" to "retreat"; remove "retreated" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
27081	4	109	2	0		Replace negative consequences with drawbacks: Co-benefits and drawbacks of retreat [Kees Lokman, Canada]	Accepted - text revised.
32579	4	109	2	109	31	The positive effects of the migration are not discussed clearly. Further I miss some positive consequences such as better quality of education for children, health care access, etc. The table with the positive/negative consequences could be very useful in the context. [Robert Stojanov, Czech Republic]	Accepted - text revised.
6817	4	109	3	0		Remove "the one of" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6819	4	109	7	0		Suggest rephrase " Voluntary … households" to "Through voluntary migration individuals and households can move" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
14025	4	109	19	109	31	Are there examples of where relocation has been carried out successfully? In addition in the last sentence states, 'as a result, planned relocation aroused controversy', does this mean it could or is it referring to a particular example? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - we added some examples.
6821	4	109	23	0		Insert "the fact" after "reflects" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6823	4	109	30	0		Suggest change "aroused" to "resulted in" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
31271	4	109	30	109	30	Suggest to be more specific about controversies around planned relocation – where and how? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - text revised.
15093	4	109	41	109	43	Please consider the following information to improve the sentence: The mentioned Nansen Initiative is followed up by the State-led Platform on Disaster Displacement (2016) to continue the work of the Nansen Initiative to support the implementation of the Protection Agenda. There have been various resolutions and other documents to address the gap (e.g. outcome documents 5th Global Platform for Disaster Risk Reduction 2017, ECOSOC Resolution E/2017/L.24, Human Rights Council Resolution HRC/35/L.32 2017, UN General Assembly Resolution A/RES/72/132 2017, Words into Action Guidance on Disaster Displacement 2018 to help implement the Sendai Framework on DRR, Global Compact for Migration final text, Task Force on Displacement recommendations within the UNFCCC's Warsaw International Mechanism). See e.g. link: URL: https://docs.google.com/viewerng/viewer?url=https://disasterdisplacement.org/wp-content/uploads/2018/10/Platform-on-Disaster-Displacement-leaftlet-EN_for_website.pdf&hl=en, page 11 [Government of Germany, Germany]	Accepted - we have added reference to this.
6825	4	109	48	0		"regionin" to "region in" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
23213	4	110	0	110		I would rather suggest to better capture these main points in the ES than have multiple syntheses distributed across the chapter. [Valerie Masson-Delmotte, France]	Accepted - we have followed this suggestion and droped the synthesis
6827	4	110	4	0		Insert "an"' before "approach" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6829	4	110	12	0		Insert "the" after "both" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
6831	4	110	19	0		Insert "the" after "building"; insert "the" after "reducing" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31407	4	110	23	0		This synthesis as much as the ES misses out on emphasizing the quantitative dimensions in this report although some key figures seem to be available. Emphasizing these will increase the impact of this chapter as well as the whole report. [Hans-Otto Poertner and WGII TSU, Germany]	Noted - synthesis section has been removed due to a lack of space
6833	4	110	28	0		Change "protections" to "protection" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
14027	4	110	28	110	35	There is no comment on the relative cost effectiveness here of hard versus sediment-based protection responses. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Noted - synthesis section has been removed due to a lack of space
9145	4	110	32	0		Change "build" to "built" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
6835	4	110	33	0		Insert "a" before "move" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
6837	4	110	50	0		Insert "the" before "achievement" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
6839	4	111	4	0		Change "measure" to "measures" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
6841	4	111	16	0		Insert "as" before "regional" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
21855	4	111	30	111	31	Should be noted, with the backdrop framing of ongoing and escalating hazard exposure, that residual risk will increase with time with ongoing SLR - rather than a static finite probability. [Robert Bell, New Zealand]	Noted - synthesis section has been removed due to a lack of space
6843	4	111	32	0		Suggest rephrase "Only…risks" to "Retreat can only avoid residual risks" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
6845	4	111	36	0		Insert "of" before "these" [Nina Hunter, South Africa]	Noted - synthesis section has been removed due to a lack of space
10385	4	111	43	111	44	How can this be a new phenomenon for small islands since it has been there for several years and they are already going through it? [Mahmood Riyaz, Maldives]	Noted - synthesis section has been removed due to a lack of space
31273	4	111	43	111	44	It is not clear why particularly for small islands SLR should be a new phenomenon. Small islands have experienced changing environmental conditions, including extreme sea level hazards, for a long time. Especially without evidence, this statement is problematic. [Hans-Otto Poertner and WGII TSU, Germany]	Noted - synthesis section has been removed due to a lack of space
31275	4	111	44	112	1	It is not clear what this assessment is based on. Needs (cross)-references. [Hans-Otto Poertner and WGII TSU, Germany]	Noted - synthesis section has been removed due to a lack of space
10387	4	111	51	111	52	supporting poorer and rural communities through transfer payments or donor finance. (is this the only issue? How about the vailability of finance? Government prioratisation issues etc? [Mahmood Riyaz, Maldives]	Noted - synthesis section has been removed due to a lack of space

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11139	4	112	0	120		Section 4.4.4 looks quite “abstract”. Despite the reference to a specific cases of decision-making for specific local/regional adaptation to environmental changes, the whole chapter seems to deal more with the technical aspects of different techniques to provide tools for the decision makers, where the specificity of the Sea Level Rise or even to environment-related problems is hardly visible. It looks more a discussion on the tools than a discussion on the problems. The focus could be moved more on the specific climate change related problems, and away from the literature that has addressed those problems. Moreover, there are a bit too many typos and syntactical omissions that make some sentences difficult to understand. [Valentina R. Barletta, Denmark]	Accepted - we have added cases and highlight many non technical aspects
15639	4	112	0	120		Section 4.4.4 looks quite “abstract”. Despite the reference to a specific cases of decision-making for specific local/regional adaptation to environmental changes, the whole chapter seems to deal more with the technical aspects of different techniques to provide tools for the decision makers, where the specificity of the Sea Level Rise or even to environment-related problems is hardly visible. It looks more a discussion on the tools than a discussion on the problems. The focus could be moved more on the specific climate change related problems, and away from the literature that has addressed those problems. Moreover, there are a bit too many typos and syntactical omissions that make some sentences difficult to understand. [EUCE, Belgium]	Accepted - we have added cases and highlight many non technical aspects
30459	4	112	2	112	4	However, the possible role of extreme events as well as the possible acceleration of trends might require changes in policies or new policies and, importantly, a multi scale monitoring strategy could help introducing those changes sufficiently early to limit the risk of negative impacts (e.g.: Hermans et al., 2017). Such monitoring strategy should be as detailed and focused as required by the vulnerability of the area. [Michele Capobianco, Italy]	Accepted - sentence has been dropped
14029	4	112	8	112	10	What does the phrase 'wicked problem' refer to? This has not been used elsewhere in the chapter. Please explain or remove this term. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - the term has been removed from the chapter
6847	4	112	9	0		Suggest remove "the" [Nina Hunter, South Africa]	Noted and addressed in proofing FGD
9655	4	112	20	112	26	These placeholder sections are quite important, and needs to include (by earlier reference) discussion of level of acceptable risk, social needs and objectives, and planning as an instrument. [Government of France, France]	Noted and addressed in FGD

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
20187	4	112	22	112	22	Missing section 4.4.4.1. [APECS Group Review, Germany]	Accepted and addressed in FGD
25683	4	112	26	112	26	Mention must be made here of local practices such as increasing the coastal dune height by placing palm leaves and other such material to block aeolian transported sand grains and subsequent plantation of vegetation; mangrove afforestation etc [Government of India, India]	Noted - details about ecosystem based adaptation responses are outlined in various sections, notably 4.4.2.3
16409	4	112	30	114	36	Currently, subsections 4.4.4.3.1 and 4.4.4.3.2 remain very abstract and only provide few SLR/coastal specifics on 'Approaches for Making Social Choices and Appraising and Institutionalizing Adaptation Pathways'. Please make sure to provide as many concrete examples for the analysis of SLR adaptation alternatives as possible. [Alexander Nauels, Germany]	Accepted - we have shortened 4.4.4.3.1 and introduced more examples.
16411	4	112	37	112	37	Decision analysis methods identify alternatives form available alternatives? This could be rather confusing for the reader… [Alexander Nauels, Germany]	Accepted - text has been revised
32055	4	112	47	112	54	Social values can also change. This is one of the uncertainties about the future (e.g. work of van Asselt) that could be considered when exploring adaptation pathways. For example, if future generation has different values. For this it is important to consider whether current decisions foreclose future options or have irreversible or difficult to reverse impacts. See for example work of Offermans et al https://doi.org/10.1002/sd.439 .Haasnoot et al 2012 10.1007/s10584-012-0444-2 [Marjolijn Haasnoot, Netherlands]	Accepted - reference to goals, values and preferences has been added.
21857	4	113	2	113	4	Should add in Refs mentioned in my previous comments (row 25) - Haasnoot et al 2018 and row 33 - Stephens et al (2018) that deal with the importance of monitoring early signals and then triggers for switching to an alternate adaptive pathway. Refs: Haasnoot, M, van 't Klooster, S, van Alphen, J (2018). Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environment Change 52: 273-285. Stephens, S.A.; Bell, R.G.; Lawrence, J. (2018). Developing signals to trigger adaptation to sea-level rise. Environmental Research Letters 13(10): 104004, 11 p. https://doi.org/10.1088/1748-9326/aadf96 [Robert Bell, New Zealand]	Accepted - citations added.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32057	4	113	4	0		Haasnoot et al 2018. provides method how to design monitoring plan, and illustrates this with application for the Dutch climate adaptation plan. Mmight be good that make explicit that this is not only about learning about the effectiveness of adaptation options, which has been addresssed in literature a lot (e.g. Biesbroek), but also to detect early warning signals of change. Haasnoot makes distinction between retrospective monitoring and anticipatory monitoring. Haasnoot,M., van Klooster, S., & van't Alphen, J. (2018). Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environmental Change, 273–285. https://doi.org/10.1016/j.gloenvcha.2018.08.003. [Marjolijn Haasnoot, Netherlands]	Accepted - detection of early warning signals is emphasiszed and citation was added.
21859	4	113	7	113	13	"concerning objectives" in line 7 - should note in brackets that objectives can incorporate stakeholder and community values e.g. National Guidance for NZ - Lawrence et al (2018) - and NZ Government (2017) - already in Chapter 4 Refs. In line 13 - "objectives" should be replaced by "values". Ref: Lawrence, J, Bell, RG, Blackett, P, Stephens, S, Allan, S (2018). National guidance for adapting to coastal hazards and sea-level rise: Anticipating change, when and how to change pathway. Environmental Science and Policy 82:100-107. [Robert Bell, New Zealand]	Accepted - a sentence on this was added.
6849	4	113	9	0		Change "context" to plural [Nina Hunter, South Africa]	Accepted - text has been revised
6851	4	113	10	0		"but one approach to inform to support social choices" - phrase not clear, please rephrase [Nina Hunter, South Africa]	Accepted - text has been revised
6853	4	113	12	0		Suggest remove "it"; change "context" to plural [Nina Hunter, South Africa]	Accepted - text has been revised
14031	4	113	16	114	36	This section is very complex and could be usefully simplified, it is not clear how the final conclusion has been reached from the preceding text. This section appears to be well summarised in 4.4.5.3. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - we have simplyfied the sections and improved the argumentation towards the conclusions
6855	4	113	17	0		Insert "about" after "debate" [Nina Hunter, South Africa]	Accepted - text has been revised
14033	4	113	17	113	18	There is no clear definition of 'maximising expected utility', this could usefully be explained to help readability. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted - a definition has been added.
6857	4	113	20	0		Change "ofte" into "often" [Nina Hunter, South Africa]	Accepted - text has been revised
6859	4	113	22	0		Remove "be" [Nina Hunter, South Africa]	Accepted - text has been revised
6861	4	113	25	0		Suggest change "don't" to "do not" [Nina Hunter, South Africa]	Accepted - text has been revised
6863	4	113	30	0		Insert "of" before "NPV" [Nina Hunter, South Africa]	Accepted - text has been revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32061	4	113	32	0		Only two RDM methods are mentioned. Important ons are missing. It seems in this report what is called RDM methods is similar to what others refer to as methods for decision making under deep uncertainty methods (DMDU). The international Society for Decision Making under Deep Uncertainty has a book book in press that gives an overview of methods. The book will be open access through Springer. In the book the explain the following DMDU methods: five approaches for designing policies and strategies under deep uncertainty, which include Robust Decision Making, Dynamic Adaptive Planning, Dynamic Adaptive Policy Pathways, Info-Gap Decision Theory, and Engineering Options Analysis. [Marjolijn Haasnoot, Netherlands]	Taken into account - Indeed the term RDM is not used consistently in the literature. We use RDM in a wider sense than the Springer Book Marchau et al (2019). By RDM we refer to any method that uses any kind of robustness criterion for deciding. This usage of the term RDM fits the purpose of our section, because our intension is to distinguish between methods that use a robustness criterion for deciding in opposition to expected utility methods that use the criterion of expected utility.
20189	4	113	32	113	37	What does minimax or minimax regret, info gap theort or robust optimisation mean? Is it important for understanding the rest of the section? Or the author needs to shortly explain what this is, or it's better to leave it out for readability. [APECS Group Review, Germany]	Taken into account - these methods can not be covered in detail as this involves a lot of technicalities.
9147	4	113	37	0		Suggest change "uncertainness" to "uncertainty" [Nina Hunter, South Africa]	Accepted - text has been revised
6865	4	113	41	0		Suggest remove "the one of" [Nina Hunter, South Africa]	Accepted - text has been revised
6867	4	113	42	0		Suggest change "can't" to "cannot" [Nina Hunter, South Africa]	Accepted - text has been revised
32063	4	113	42	0		The definitions of Deep uncertainty is too limited here. Deep uncertainty is not only about probabilities. For a definitions on deep uncertainty see also: Lempert et al 2003 Shaping the next one hundred yesrs and Hallegate et al 2012 Investment Decision Making Under Deep Uncertainty, and Kwakkel et al 2016 Coping with wickedness of public policy problems [Marjolijn Haasnoot, Netherlands]	Taken into account - as deep uncertainty is ambigiously defined in the literature, we now refer to the definition elaborated in Cross-Chapter-Box on uncertainty. For the purpose of this section, the main aspect is the availability of a probability distribution (type 2) as this is one decisive criteria for choosing between CBA and RDM.
21861	4	113	53	114	13	The emergence of differences in emission scenarios can also be assessed by number of moderate/nuisance floods in a finite time frame - and related to signals and triggers for switching adaptive pathways e.g. Stephens, S.A.; Bell, R.G.; Lawrence, J. (2018). Developing signals to trigger adaptation to sea-level rise. Environmental Research Letters 13(10): 104004, 11 p. https://doi.org/10.1088/1748-9326/aadf96. This study also shows emergence in the next few decades of reaching community-defined adaptation thresholds for coastal flooding. [Robert Bell, New Zealand]	Taken into account - we added the Stephens et al. to the paragraph on adaptive decision making and detecting signals for this.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21863	4	114	15	114	21	Could make the link to flexible adaptive pathways (or Dynamic Adaptive Policy Pathways - DAPP) which embeds monitoring and review to work around the conundrum of assigned probabilities to different futures e.g. Haasnoot et al (2013) [Robert Bell, New Zealand]	Rejected - the paragraph addresses a different topic.
6869	4	114	28	0		Change "expect" to "expected"? [Nina Hunter, South Africa]	Accepted - text has been revised
10389	4	114	33	114	36	Ho much of this will be applicable in the context of low lying small islands??? [Mahmood Riyaz, Maldives]	Noted - all will be applicable in the context of small islands
6871	4	114	34	0		Suggest change "minimize" to "minimizes" as it is one author [Nina Hunter, South Africa]	Accepted - text has been revised
32627	4	115	0	115		Please specify coutnry for Cuxhaven (Germany); Along the top, it's a bit confusing to have two panels with x axes as time, and then a third with x axes as probablilty. I strongly recommend deleting the top right figure, it is not even explaiend in the caption right now. May be more trouble than it's worth. If a bottom row of PDFs is warranted, you might consider mirroring from Papeete, Cuxhaven, and another thrid city to round out hte figure more systematically, rahter than mixing in the top row. [Kim Cobb, United States of America]	Accepted - Figure has been revised accordingly.
31671	4	115	1	0		Figure 4.15. It would be helpful for an international audience to complement the site labels with the corresponding #country name. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - country name added.
31673	4	115	1	0		Figure 4.15. The upper right panel currently depicts the overlapping 90%. Perhaps it would be more relevant to reverse this detail to illustrate the "diverging" 10%. If this is done, you may want to make the graph lines thinner, in order to appreciate the shading color that would be place between them. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - the upper right panel was dropped as response to comment # 32627
22787	4	115	1	115	1	Fig. 4.15: it would he helpful to indicate on the map the locations of the considered sites (upper panels). Leftmost upper panel: would it be also relevant to depict the density distribution functions for Papeete? [Jeremy Rohmer, Finland]	Accepted - the figure has been revised
10393	4	115	1	115	7	Not sure if this figure is most suitable here as it talks about robut decision making? Also scenario divergence is not discussed in the section [Mahmood Riyaz, Maldives]	Taken into account - the figure belongs here but we have improved the text explaining the figure.
16413	4	115	2	115	7	Figure 4.15 has to be better intergrated in the narrative of section 4.4.3.2. The link between choosing expected utility/RCM approaches and the scenario divergence figure is not sufficiently clear [Alexander Nauels, Germany]	Taken into account - we have improved the text explaining the figure.
6873	4	115	12	0		Suggest remove "there" [Nina Hunter, South Africa]	Editorial – copyedit to be completed prior to publication
23215	4	116	0	117		Too many new acronyms used only here, just spell out words. [Valerie Masson-Delmotte, France]	Accepted - text has been revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21865	4	116	1	116	7	Well composed paragraph. Could make the last sentence more specific - as rather than "inputs" - could insert "used to evaluate response options for robust ..... and flexible decision making" [Robert Bell, New Zealand]	Taken into account - text revised
6875	4	116	6	0		Suggest remove "the" [Nina Hunter, South Africa]	Accepted - text has been revised
6877	4	116	9	0		Suggest remove "along" [Nina Hunter, South Africa]	Accepted - text has been revised
6879	4	116	20	0		Consider rephrasing "when more is known about SLR" to be more specific. Perhaps the following: "should sea level rise necessitate this" [Nina Hunter, South Africa]	Accepted - text has been revised
6881	4	116	20	0		Suggest insert "a" before "staged" [Nina Hunter, South Africa]	Accepted - text has been revised
6883	4	116	26	0		Suggest insert "on" before "until" [Nina Hunter, South Africa]	Accepted - text has been revised
21867	4	116	26	0		The adaptation tipping point for DAPP is when alternatives are no long effective in meeting agreed objectives - so "effective" should be replaced by "ineffective" [Robert Bell, New Zealand]	Accepted - text has been revised
6885	4	116	27	0		Suggest replace "then" with "that will then be" [Nina Hunter, South Africa]	Accepted - text has been revised
6887	4	116	28	0		Replace "suggest" with "suggests" [Nina Hunter, South Africa]	Accepted - text has been revised
30461	4	116	29	116	30	As time and SLR progresses, dedicated monitoring tuned according to the vulnerability of the specific coastal area may trigger a decision to select and prepare for switching to an alternative. The specific conditions and patterns to trigger such decisions are clearly related with the specific vulnerability of the specific coastal areas and should be subject to dedicated local scenario analysis. [Michele Capobianco, Italy]	Rejected - unfortuntly we have to reduce the word count of this section.
16415	4	116	32	116	32	What is the difference between the 'adaptation pathway analysis' method presented here, and the 'analysis of adaptation alternatives' presented on p112 l47? Please differentiate more clearly between the different approaches to avoid confusion and streamline. [Alexander Nauels, Germany]	Accepted - text has been revised
21869	4	116	32	116	40	Line 34 - should add and incorporated into national coastal guidance for New Zealand (Lawrence et al., 2018). Lawrence, J, Bell, RG, Blackett, P, Stephens, S, Allan, S (2018). National guidance for adapting to coastal hazards and sea-level rise: Anticipating change, when and how to change pathway. Environmental Science and Policy 82:100-107 and NZ Government (2017) - already in Chapter 4 Refs. At end of Line 40 - could also add same reference(s), as we have provided guidance to councils on principles for engagement processes. [Robert Bell, New Zealand]	Accepted
14035	4	116	38	116	40	In terms of the further assistance referred to in this section, does this refer to further scientific literature on the subject or something else? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - sentence was unclear and has been dropped.
6889	4	116	42	0		Suggest change "pathway" to plural [Nina Hunter, South Africa]	Accepted - text has been revised

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
32065	4	116	42	0		We have a paper under review that introduces an approach to evaluate pathways. The approach considers the notion of transfer costs, which are the costs of course correction in light of changing circumstances. Transfer costs reflect the potential for path-dependency and are determined by the sequence and timing of investments. Costs of removing previous actions and the higher or lower costs related to implementing a new action in the future would be common examples of transfer costs. Transfer costs could be considered an extension of the option value to evaluate the flexibility of a decision in the real options analysis approaches, or an extension of scenario based cost benefit analysis that considers decision making over time and path-dependency. Haasnoot, M., van Aalst, M., Rozenberg, J., Dominique, K., Matthews, J., & Bouwer, L. M., (under review). Investments under non-stationarity: Economic evaluation of adaptation pathways. [Marjolijn Haasnoot, Netherlands]	Accepted - Thanks, we have included this paper.
21871	4	116	42	116	45	But such flexible methods can circumvent this issue to some extent by adopting and monitoring signals and triggers, building in sufficent lead time, so that the next pathway can be implemented before cumulative damage becomes intolerable e.g. Refs: a) Haasnoot, M, van 't Klooster, S, van Alphen, J (2018). Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environment Change 52: 273-285; b) Stephens, S.A.; Bell, R.G.; Lawrence, J. (2018). Developing signals to trigger adaptation to sea-level rise. Environmental Research Letters 13(10): 104004, 11 p. https://doi.org/10.1088/1748-9326/aadf96. [Robert Bell, New Zealand]	Taken into account - this is already said above.
6891	4	116	43	0		Suggest insert "the" before "timing" [Nina Hunter, South Africa]	Rejected - this in not the intended meaning
21873	4	116	48	116	51	Another application of ROA for evaluating pathways in the context of applying a flexible adaptation approach is documented in Lawrence, J & Haasnoot, M (2017). - already in Refs for Chapter 4 [Robert Bell, New Zealand]	Rejected - this is more a riverine flooding context.
6893	4	116	54	0		Change "application" to plural [Nina Hunter, South Africa]	Accepted - text has been revised
6895	4	116	56	0		Suggest remove "on" before "which" [Nina Hunter, South Africa]	Accepted - text has been revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
27083	4	117	6	0		In the paragraph that starts at line 6, consider integrating the need and role of visualization and scenario planning as powerful tools to show how coastal areas have changed and may change in the future. These tools also provide methods for communities, action groups, educators, and experts to engage the public, build awareness and accelerate action on the SLR adaptation. [Kees Lokman, Canada]	Rejected due to a lack of space.
21875	4	117	6	117	17	May be too late- but we have a paper in press that documents a hybrid approach combining DAPP with MCDA and ROA in the context for community collaborative engagement process (panels) for the community to determine pathway sequences for the next 100-year planning timeframe: Lawrence, J.; Bell, R.G.; Stroombergen, A. (in press). A hybrid process to address uncertainty and changing climate risk in coastal areas using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis. Sustainability – Special Issue: Policy Pathways for Sustainability (accepted). [Robert Bell, New Zealand]	Noted
6897	4	117	12	0		Suggest change "be also" to "also be" [Nina Hunter, South Africa]	Accepted - text has been revised
32067	4	117	19	34		An additional gap, is the consideration that adaptation to sea level rise is a multistakeholder environment. This is not yet adressed, also limited in decision analysis. Adaptation of one stakeholder can influence the options of another stakeholder. [Marjolijn Haasnoot, Netherlands]	Accepted - text has been revised
10395	4	117	19	117	34	There is a also difference between the type of analysis required between the countries based on their economic political environmentl etc status the approach will differ depending on the particular country context [Mahmood Riyaz, Maldives]	Accepted - a sentence on this was added.
6899	4	117	24	0		Change "loosing" to "losing" [Nina Hunter, South Africa]	Accepted -text revised
21877	4	117	27	117	28	It isn't just the deep uncertainty per se that effects CBA approaches but also evaulation of response options, with different life cycles (use-by-dates), in the context of the ongoing changing risk with time. CBA is primarily designed to compare options is a static sense. A recent paper addresses the shortcomings of CBA framed by its historic development: Dennig, F (2018). Climate change and the re-evaluation of cost-benefit analysis. Climatic Change 151: 43-54. doi 10.1007/s10584-017-2047-4 [Robert Bell, New Zealand]	Noted - Due to a lack of space, we focus on the deep uncertainity aspect here. Further CBA can also be applied in a dynamic way.
6901	4	117	31	0		Suggest change "those" to "these"; remove "a" [Nina Hunter, South Africa]	Accepted -text revised

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
31277	4	117	36	0		Sections 4.4.4.4.3, 4.4.4.4.4, and 4.4.4.4.5 overlap with Section 4.4.5. Suggest to move or integrate their key findings there, and keep 4.4.4.4 to actual community-based adaptation. [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - overlap has been adressed.
9657	4	117	38	117	48	The correlation between 1) “poverty” (& vulnerability) and 2) the use of CBa should be explained. [Government of France, France]	These topics are well covered in previous IPCC assessments. Space limitations prevent us from covering them again here.
9659	4	117	38	117	48	Relevance of the use of the word “poor” without any definition or reference or example, for it seems negative; being “poor” according to international economical criteria does not involve that the communities acknowledge/classify themselves as “poor”. [Government of France, France]	Taken into account - we have minimised the use of 'poor' which is one dimension of vulnerability - as assessed in 4.3.2 ito both human and environmental vulnerability. We also focus attention on equity and vulnerability as a distinctive governance challenge arising from SLR and alternative responses (4.4.3.3).
9661	4	117	38	117	48	The UNESCO symposium regarding indigenous people and climate change (Nov. 2015, Paris) could be used as a reference to explain the link between poverty and places where TK (or LK) & IK can be used. [Government of France, France]	Taken into account - we have focused on assessing scholarly literature on this matter.
9663	4	117	38	117	48	Correlation between the fact of being “poor” and the fact of being more “available” or more ready/keen for participatory CBa is not clear. [Government of France, France]	Taken into account - this has been addressed in revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
21879	4	117	40	117	41	CBa is not just a process for the world's poorest - but is being used across a wide spectrum of communities - with collaborative and empowerment modes of the IAP2 public participation spectrum embeeded in NZ's national coastal guidance as just one of no doubt many examples (Lawrence et al. 2018, NZ Government-2017) - doen't need a reference but sentence needs expanding. [Robert Bell, New Zealand]	Accepted - this has been addressed in revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
31279	4	117	41	117	41	Is CbA only relevant for ‘the world’s poorest people’? [Hans-Otto Poertner and WGII TSU, Germany]	Accepted - this has been addressed in revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
29955	4	117	46	117	48	include some citations [Anna Zivian, United States of America]	Taken into account - this has been addressed in revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
11141	4	118	0	122		Sections 4.4.4.4.2 to 4.4.4.4.5, The part of the “Participatory approaches and tools” and subsequent (Pages 118-122) are interesting, though quite generic, and I’m a bit surprised that the risks of those technique for creating consensus around the decisions are not mentioned at all. The risk of manipulations of the local communities is far from being purely theoretical [Valentina R. Barletta, Denmark]	Taken into account - this and other concerns raised about assessing community based adaptation have been addressed in substantial revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15641	4	118	0	122		Sections 4.4.4.4.2 to 4.4.4.4.5, The part of the “Participatory approaches and tools” and subsequent (Pages 118-122) are interesting, though quite generic, and it is surprising that the risks of those technique for creating consensus around the decisions are not mentioned at all. The risk of manipulations of the local communities is far from being purely theoretical. [EUCE, Belgium]	Taken into account - this and other concerns raised about assessing community based adaptation have been addressed in substantial revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
20191	4	118	15	118	15	Explain what does pro-poor development mean. [APECS Group Review, Germany]	Accepted - term removed
9665	4	118	28	118	28	Is it normal that there are no references to TK/LK & IK somewhere although these paragraphs are dedicated to “participation” - where TK and IK can especially be useful? There should be a more obvious references to the chapter dedicated to TK/LK & IK? [Government of France, France]	Taken into account - this concern about TK/LK and other concerns raised about assessing community based adaptation have been addressed in substantial revisions to the structure and content of 4.4.4 - to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. Relevant references to IK&LK have been included as appropriate e.g., Table 4.10
24109	4	118	28	119	51	Becu et al. developed innovative participatory simulations of storm-induced flooding aiming at fostering social learning on coastal flooding prevention: Becu, N., Amalric, M., Anselme, B., Beck, E., Bertin, X., Delay, E., Long, N., Marilleau, N., Pignon-Mussaud, C., Rousseaux, F., 2017. Participatory simulation to foster social learning on coastal flooding prevention. Environmental Modelling and Software, 98, pp. 1-11. [Sylvain Ouillon, France]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. References related to participatory scenario analysis are used where appropriate, with a focus on those explicitly related to SLR responses.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
28099	4	118	29	119	51	An additional focus and form of community-based (CB) approaches is the work of Scotland's Scottish Coastal Archaeology and the Problem of Erosion Trust (SCAPE, scapetrust.org), particularly it's work with community participation in decision-making and implementation of action for cultural heritage along the coast that is at high risk of erosion. SCAPE's work includes facilitated discussions with communities about their visions for the future and ways in which preserving, letting go, and telling stories of local heritage can assist with that. A recent major workshop on this topic is here: https://www.scottishinsight.ac.uk/Programmes/Scotland2030/LearningfromLoss.aspx. My understanding is that publications will be forthcoming. In the US, Heritage Monitoring Scouts program of the Florida Public Archaeology Network is running complementary programs, which are described here: Sarah E. Miller & Emily Jane Murray (2018) Heritage Monitoring Scouts: Engaging the Public to Monitor Sites at Risk Across Florida, Conservation and Management of Archaeological Sites, 20:4, 234-260, DOI: 10.1080/13505033.2018.1516455 [Marcy Rockman, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. We have focused attention on SLR specific scholarly literature; it was not possible within word limits to assess the vast grey literature on this matter.
28101	4	118	29	119	51	Work is underway in the US National Park Service to merge resource management decision making for coastal cultural heritage at risk from sea level rise and related impacts and the preferences, memories, and attachments of local communities. An initial assessment of community perspectives on change and heritage at Cape Lookout National Seashore is Henderson, M. and Seekamp, E. 2017. Informing Plans for Managing Resources of Cape Lookout National Seashore under Projected Climate Change, Sea Level Rise, and Associated Impacts: Community Members Interviews Report. Tourism Extension Report Series 2017-CALO-001. Department of Parks, Recreation, and Tourism Management, College of Natural Resources, NC State University, Raleigh, NC. http://www.lib.nscu.edu/resolver/1840.20/34902. [Marcy Rockman, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. We have focused attention on SLR specific scholarly literature; it was not possible within word limits to assess the vast grey literature on this matter.
9667	4	118	36	118	48	This section could usefully explicitly mention the concepts of co-development and co-production of knowledge and decisions. [Government of France, France]	Taken into account - these concepts are spotlighted in the Chapter Box on Community based experiences in the Arctic.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6903	4	118	41	0		Suggest changing "involving" as the word "involved" was used a few words before [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6905	4	118	43	0		Suggest change "to" to "for" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
21881	4	118	44	118	48	In NZ, through national coastal guidance, councils engage communities using a collaborative (bottom-up) engagement process and with indigenous groups - extend in some cases to empowerment, on adapation choices. Lawrence et al. (in press) is an exposition and critique of a community-led adaptation process through Panels planning for the next 100-years in what historically has been a highly-contested space. Ref: Lawrence, J.; Bell, R.G.; Stroombergen, A. (in press). A hybrid process to address uncertainty and changing climate risk in coastal areas using Dynamic Adaptive Pathways Planning, Multi-Criteria Decision Analysis & Real Options Analysis. Sustainability – Special Issue: Policy Pathways for Sustainability (accepted). [Robert Bell, New Zealand]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6907	4	118	45	0		Word missing between "provided" and "stakeholders" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6909	4	118	50	0		Suggest move "in Bangladesh" to after "capacity" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6911	4	118	54	0		Suggest insert "the" before "social" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6913	4	119	4	0		Change "Participation" to lower case or replace colon with a fullstop [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9669	4	119	9	119	19	Terms like “underrepresented” should be defined in an earlier discussion. California’s Office of Planning and Research report on vulnerability and adaptation could be a useful reference here: http://opr.ca.gov/docs/20180723-Vulnerable_Communities.pdf [Government of France, France]	Accepted - the term has been removed from the chapter due to vagueness / potential misunderstanding.
29957	4	119	9	119	19	define all these terms (e.g., vulnerable, underserved, underrepresented, poor….) [Anna Zivian, United States of America]	Accepted - such terms have been defined more clearly or removed from the chapter due to vagueness / potential misunderstanding.
6915	4	119	23	0		Change "has" to "have" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6917	4	119	24	0		Suggest change "found" to "find" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6919	4	119	36	0		Suggest inserting "has" before "added" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
9671	4	119	46	119	51	Either here or elsewhere, the barrier of costs and training needed to implement small-group deliberation and inclusive stakeholder processes more generally should probably be noted or addressed. [Government of France, France]	Taken into account - the practical challenges inherent in public participation are highlighted in 4.4.4.2; and lessons learned from experience briefly spotlighted in 4.4.5
29959	4	119	46	119	51	worth raising the issue that there are substantial costs and capacity building needed to implement this kind of stakeholder process [Anna Zivian, United States of America]	Taken into account - the practical challenges inherent in public participation are highlighted in 4.4.4.2; and lessons learned from experience briefly spotlighted in 4.4.5
31281	4	119	53	0		This section somehow mixes the community element and the pathway/long-term vision, which is confusing. Especially the paragraphs citing Kench, Brown, and Hinkel do not really fit the the emphasis on community-based approaches of this section. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. We have focused attention on SLR specific scholarly literature; it was not possible within word limits to assess the vast grey literature on this matter.
14037	4	119	54	119	57	Please state where the Fraser River Delta is. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6921	4	119	56	0		Which country is this city in? [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
27085	4	120	2	0		The findings for the study on Detla, BC are published in: Tatebe, K., Alison Shaw and Stephen Sheppard. Technical Report on Local Climate Change Visioning for Delta: Findings and Recommendations. Version 1.0, Feb. 22, 2010. Collaborative for Advanced Landscape Planning, University of BC. 42 pgs. [Kees Lokman, Canada]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
2215	4	120	4	120	7	It should be noted that accreted land is not immediately suitable for permanent human habitation [Frank Thomas, Fiji]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
10397	4	120	4	120	7	Sample size is very important giving such a vague and borad conclusion based on a study in few islands cant be generalised to all the atoll nations, this is dangerous. [Mahmood Riyaz, Maldives]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6923	4	120	5	0		Suggest replace "sea level rising" with "rising sea levels" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
9673	4	120	9	120	12	It needs more details – what were the different outcomes? [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6925	4	120	11	0		What were these different outcomes? [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
29961	4	120	11	120	12	in what ways were the outcomes different? [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6927	4	120	21	0		Change "association" to "associated" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
9675	4	120	38	120	40	Reference could be welcome when quoting the notion of “local champions”. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6929	4	120	49	0		Suggest replace "they" with "these authors" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6931	4	120	51	0		"practitioners" missing an apostrophe [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6933	4	121	30	0		Change "informationexchange" to two words [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
31283	4	121	38	121	38	Cite proper SR1.5 chapter [Hans-Otto Poertner and WGII TSU, Germany]	Noted
12091	4	121	50	121	50	“Taiwan” is changed to “Taiwan Province of China”。 [Government of China, China]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6935	4	121	52	0		Suggest insert "necessary" before "in order" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6937	4	121	54	0		Insert "the" before "formulation" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
6939	4	121	55	0		Suggest replace "the" with "a" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
11143	4	122	0	130		Section 4.4.5 is well written [Valentina R. Barletta, Denmark]	Thank you. Note: substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
15643	4	122	0	130		Section 4.4.5 is well written [EUCE, Belgium]	Thank you. Note: Substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
27223	4	122	0	130		I suggest inclusion of persons with disability (PWDs) here in the introduction for implementing responses as well as in subsequent text under enablers, barriers and lessons. Persons with disability are often excluded in designing responses, policy processes etc so would be important to include while acknowledging that there isn't much research evidence on disability and climate change. Suggested content if this is taken onboard includes: responses have to be targeted and disability friendly e.g evacuation shelters with ramps and facilities accesible to them; information in formats accessible to persons with diasbility etc. Please see a report on climate change and disability https://assets.publishing.service.gov.uk/media/5af94ae4e5274a25e78bbe03/FINAL_Climate_research_report_100518.pdf [Winnie Khaemba, Kenya]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. Your point is well made. However, we could not find any scholarly literature linking disabilities and SLR responses.
32059	4	122	1	122	10	Haasnoot et al 2018. provides method how to design monitoring plan to detect signals to implement or adjust an adaptive plan that is for example based on adaptation pathways. They give criteria to evaluate signposts: measurability, timeliness, reliability, convincibility (for stakeholders to act) and institutional connectivity. They illustrate this with application for the Dutch climate adaptation plan. Diermanse et al under review and Haasnoot et al 2018 discuss the challenge to find timely and reliable signals for adaptation, and how statistical analysis of time-series can be used to evaluate the performance of signposts. Diermanse et al under review also show that combining multiple signposts can help to find a more reliable signal. Haasnoot,M., van Klooster, S., & van't Alphen, J. (2018). Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environmental Change, 273–285. https://doi.org/10.1016/j.gloenvcha.2018.08.003. [Marjolijn Haasnoot, Netherlands]	Taken into account - reference has been made to this article in relevant sections of the chapter.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
21883	4	122	5	122	8	Also now a second Refence (Haasnoot et al. 2018) to add to the Hermans Ref on exploring in more detail the selection and implementation of signals and triggers for the Delta programme: Ref: Haasnoot, M, van 't Klooster, S, van Alphen, J (2018). Designing a monitoring system to detect signals to adapt to uncertain climate change. Global Environment Change 52: 273-285. [Robert Bell, New Zealand]	Taken into account - reference has been made to this article in relevant sections of the chapter.
6941	4	122	8	0		Suggest replace "they" with "the authors" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South.
5493	4	122	12	122	39	it maybe consider this reference : Documentary reports on climate change under the IPCC supervision are provided In order to obtain opinions and information from various organizations, meetings have been held in previous years with the cooperation of member organizations And with the direction of the IRIMO, plans and strategies are determined. [rashidian leila, Iran]	Taken into account - substantial revisions to the structure and content of 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. The proposed sentence was not a logical addition to these revisions.
5547	4	122	12	122	39	it maybe consider this reference : Documentary reports on climate change under the IPCC supervision are provided In order to obtain opinions and information from various organizations, meetings have been held in previous years with the cooperation of member organizations And with the direction of the IRIMO, plans and strategies are determined. [Government of Iran, Iran]	See response to 5493
5495	4	122	12	130	28	it maybe consider this reference :There is no section 4.4.6 between 4.4.5 and 4.4.7 [rashidian leila, Iran]	Accepted and addressed in FGD
5551	4	122	12	130	28	it maybe consider this reference :There is no section 4.4.6 between 4.4.5 and 4.4.7 [Government of Iran, Iran]	See response to 5495
20193	4	122	24	122	25	The factors (challenges created by climate change) i.e., economic, social, environmental etc are repeated. It may better be rephrased as "Climate change is creating new challanges for coastal zones by shaping economic, social, environmental and political relations to be faced by local governments with financial and environmental constraints to reduce the risk and build resilience." [APECS Group Review, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.3 and 4.4.4 have been made to better reflect how participatory processes together with other tools are used to make community decisions about SLR in both the Global North and South. This includes the distinctive governance challenges faced in responding to SLR.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
5549	4	122	31	122	31	it maybe consider this reference :in article "Evolutionary trend of the Gorgan Bay (southeastern Caspian Sea) during and post the last Caspian Sea level rise" Mohammadreza Gharibrezaa-Ali Nasrollahi-Amin Afshar-Ata Amini-Hossein Eisaeid-July 2018-https://doi.org/10.1016/j.catena.2018.04.016 World-class climate scientists and Physical oceanography recognize the Caspian Sea as a natural dynamic model of fluctuating water level developments.The annual rate of change in its SLR, which is usually more than 100 times the ocean surface fluctuation.Different hydrological behavior against weather and meteorological phenomena. The level of the Caspian Sea's water level declined about -29 meters from 1930 to 1978 with a rapid decline. after that,until 1995 with an increase of 2.5 meters, the level of the Caspian Sea surface reached to -26.5 meters.Again, the Caspian Sea suffered a widespread recovery between 1995 and 2017.And its level of surface Decreased about 1.4 meters.Sometimes the speed of the sea level has reached more than 20 cm per year, and sometimes it has risen to more than 14 cm a year.So the Caspian Sea Dynamically fluctuates the level of water level is very different.This has led to a change in the severity of the physical vulnerability of its coastal land to erosion hazards. [Government of Iran, Iran]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
21885	4	122	33	122	35	Sentence could be made more specific/relevant to a common trap, as indeed the paper outlines e.g. could revise to "Adaptation to a new state (e.g. planning for some specified amount of SLR), intead of ..." [Robert Bell, New Zealand]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
3035	4	122	33	123	39	These 2 paragraphs are very important for adaptation policies that consider sea-level scenarios only and neglect rates and uncertainties of SLR. If not complemented with a dynamic management approach, these policies will fail when SLR will exceed the scenario considered. An illustrative example could be the case of France which applies a uniform 60cm SRL scenario by 2100 (and 20cm now) for its coastal risk prevention plans, which results in constraints in the other urbanism regulation. There are other similar examples in US agencies and other countries. [Goneri Le Cozannet, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.

SROCC Second Order Draft Government and Expert Review Compiled Comments - Chapter 4							
Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6943	4	122	34	0		Suggest remove "the" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South. Table 4.10 outlines the synopsis of this assessment.
29355	4	122	45	0		The current open access data used as a basis for the vulnerability assessment (notably Sentinel2 / Landsat 8) allows only rough scales of measurement (regional level) (Rabehi, 2018). The provision of some very high resolution imagery (Pleiades, QuickBird, Ikonos ….) Allow a better monitoring of the sea level (local level, by beach). [Walid Rabehi, Algeria]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South. Table 4.10 outlines the synopsis of this assessment.
29963	4	123	6	123	6	add "scientific" uncertainty, or if all uncertainty, more needed here on socioeconomic information [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South. Table 4.10 outlines the synopsis of this assessment.
20195	4	123	25	123	25	It should be "…being an order of smaller magnitude". [APECS Group Review, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South. Table 4.10 outlines the synopsis of this assessment.
6945	4	123	32	0		Suggest replace "for" with "in" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South. Table 4.10 outlines the synopsis of this assessment.
20197	4	123	38	123	38	It is suggested "…requires close and effective interaction…". [APECS Group Review, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South. Table 4.10 outlines the synopsis of this assessment.
31285	4	123	41	0		Barriers to what? The focus and scope of this sub-section under 'accounting for uncertainty' is not clear, given that it is so short and generic, and not addressing uncertainty. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2).
9677	4	123	41	123	41	In the barriers section, add costs of ongoing, long-term monitoring. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2).
29965	4	123	41	123	48	add the costs of monitoring as a barrier [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2). See also costs of alternative SLR response options (4.4.2).
14039	4	123	44	123	48	The summary of Van der Brugge and Roosjen is not clear, are they suggesting that institutional and socio-cultural changes can result in the failure to implement adaptation strategies? [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2).

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6947	4	123	45	0		Suggest "van" starts with a capital letter [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2).
27087	4	123	49	0		Other major barriers to adaptation are lack of funding (mechanisms) and lack of political will at either local, regional or national levels of government. [Kees Lokman, Canada]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2).
6949	4	123	52	0		Word missing after "think" - suggest "through" or "about" [Nina Hunter, South Africa]	Taken into account - substantial revisions to the structure and content of 4.4 have been made including a new section on barriers or governance challenges (4.4.3.2).
20199	4	123	53	123	56	The bullet numbering is changed to roman at 4th point (line 56). [APECS Group Review, Germany]	Accepted
6951	4	123	56	0		Suggest change "iv" to "4"; insert "of" before "climate" [Nina Hunter, South Africa]	Accepted
6953	4	124	1	0		Suggest insert "a" before "long-term" [Nina Hunter, South Africa]	Addressed in final proofing of FGD
20201	4	124	6	124	7	It may be "...shift in adaption technique carries a real and broad potential for a better integration of SLR and gradual changes." [APECS Group Review, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
6955	4	124	7	0		Suggest change "works" to singular [Nina Hunter, South Africa]	Addressed in final proofing of FGD
21887	4	124	10	0		Could add " ...and adoption in national guidance for local government (e.g. NZ Government, 2017; Lawrence et al., 2018) - [1st Ref already in Chapter 4 Refs, Last Ref: Lawrence, J, Bell, RG, Blackett, P, Stephens, S, Allan, S (2018). National guidance for adapting to coastal hazards and sea-level rise: Anticipating change, when and how to change pathway. Environmental Science and Policy 82:100-107] [Robert Bell, New Zealand]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. This includes reference to the NZ experience - also in new box on Hawkes Bay.
29357	4	124	11	0		Involve governments through a convention (such as COP 21), or legislative commitment, to adopt new urbanization policies (avoid coastal areas in the installation of new urban poles, and prefer inland areas) in order to decrease the exposure of the population.(Rabehi, et al., 2018) [Walid Rabehi, Algeria]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. The focus here is on local experience, but includes the importance of cross-scale coordination.
31287	4	124	12	0		The SLR component is missing or not clear in this section – is the section essential at all, or would it be enough to focus on the evidence on enablers and barriers in 4.4.5.5? Otherwise there needs to be an SLR-specific assessment of transformative adaptation practices and potentials, if available. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
29967	4	124	14	124	21	include the uncertainty caused by asymmetry of knowledge/information [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
6957	4	124	18	0		Suggest change semi-colon after "including" to colon [Nina Hunter, South Africa]	Addressed in final proofing of FGD
6959	4	124	20	0		Was a semi-colon intended instead of a comma? [Nina Hunter, South Africa]	Addressed in final proofing of FGD
29359	4	124	22	0		Need to train modeller experts for "Hard" protection works in Third World countries, where placement of protective works is often poorly sized, and has contributed to increased coastal erosion (Rabehi, 2018).) instead of stabilizing the coasts. [Walid Rabehi, Algeria]	Taken into account in assessment of SLR response options (4.4.2).
6961	4	124	26	0		Change "suggests" to "and suggest" [Nina Hunter, South Africa]	Addressed in final proofing of FGD
9149	4	124	27	0		Remove apostrophe after "point" [Nina Hunter, South Africa]	Addressed in final proofing of FGD
9679	4	124	36	124	37	Note importance of community and stakeholder input when selecting indicators, e.g. https://www.sciencedirect.com/science/article/pii/S0301479705001659 [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
29969	4	124	36	124	37	indicators selected with community and stakeholder input? [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
22529	4	124	38	124	40	Suggest noting that a "Transformative Mobilities" framework is being developed in the context of the Pacific Islands, synthesising climate change adaptation, sustainable development and migration/relocation goals, in order to positively advance the complex challenges of expansion of existing migration patterns, new migration channels, local relocations, and place-based adaptation across multiple sites, within broader development frameworks. Farbotko, C., Ransan-Cooper, H., Dun, O., McNamara, K., Thornton, F. and McMichael, C. (2018) Transformative mobilities in the Pacific: A new paradigm for research and policy Asia-Pacific Policy Studies 1-15. https://doi.org/10.1002/app5.254. [Government of Australia, Australia]	Taken into account - see inclusion of reference in context of managed retreat (4.4.2.6.6)
29971	4	124	46	125	3	this section seems to be more about barriers than about potential [Anna Zivian, United States of America]	Taken into account in substantive revisions in FGD.
6963	4	124	47	0		Remove "were" [Nina Hunter, South Africa]	Addressed in final proofing of FGD
20203	4	124	47	124	47	No need of "were". [APECS Group Review, Germany]	Addressed in final proofing of FGD
6965	4	124	48	0		Insert full stop before "In" [Nina Hunter, South Africa]	Addressed in final proofing of FGD
20205	4	124	48	124	48	Sentence ends before "In response". [APECS Group Review, Germany]	Addressed in final proofing of FGD
6967	4	124	49	0		Change "capturing" to "capture" [Nina Hunter, South Africa]	Addressed in final proofing of FGD

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
6969	4	124	50	0		Change "south" to "southern"; replace "he recognizes" with "the authors recognize" [Nina Hunter, South Africa]	Addressed in final proofing of FGD
16417	4	125	2	125	3	Rephrase and avoid using a question? [Alexander Nauels, Germany]	Addressed in final revisions to FGD
31289	4	125	5	0		This section completely lacks uncertainty/confidence statements. The content seems to provide enough material to make such statements. [Hans-Otto Poertner and WGII TSU, Germany]	Addressed in final revisions to FGD
5183	4	125	5	130	26	This critical section on local governance is not as well developed as the physical and natural science sections that precede and dominate the chapter. Important that this is more fully developed in the final draft particularly with and eye to clarifying how governance either opens or closes opportunities for response. This section is also not well represented in the ES [Debra Roberts and Durban Team, South Africa]	Taken into account in substantive revisions in FGD.
31291	4	125	12	0		The aspect of social capital is completely missing from this list. It is one of the most important enablers for local action, and you refer to it in 4.3.2.4.3. Please include it here as well. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - see Table 4.10
21889	4	125	13	130	5	If readers require an additional alternative to NZ Government (2017) Ref, an associated journal paper outlining this national guidance is Lawrence et al. (2018) , which connects the NZ national guidance with peer-reviewed literature- Ref: Lawrence, J, Bell, RG, Blackett, P, Stephens, S, Allan, S (2018). National guidance for adapting to coastal hazards and sea-level rise: Anticipating change, when and how to change pathway. Environmental Science and Policy 82:100-107 [Robert Bell, New Zealand]	Accepted
9681	4	125	34	125	40	More details or exemples would be useful. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
29973	4	125	34	125	40	more information here would be useful [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
198	4	125	42	125	48	Please add next to "(Dyckman et al., 2014; Dutra et al., 2015; New Zealand Government, 2017; 46 Rosenzweig and Solecki, 2018)." also Fatorić and Seekamp 2017c. This paper presents the first attempt to specifically document barriers to climate change adaptation for heritage preservation and identify strategies for overcoming those barriers. f S. & Seekamp, E. (2017c) Securing the future of cultural heritage by identifying barriers to and strategizing solutions for preservation under changing climate conditions. Sustainability, 9, 2143. [Sandra Fatoric, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. Word limits prevented inclusion of all examples and citations we would like to have included. Work by the recommended author are cited elsewhere in the chapter (4.3.3.6.4).
9683	4	125	42	125	48	Not a recent publication, but Tribbia and Moser 2008 addresses this usefully: https://www.sciencedirect.com/science/article/pii/S1462901108000130 [Government of France, France]	Noted - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. Post-AR5 literature was assessed and cited unless absolutely essential.
29975	4	125	42	125	48	good. Cite Moser? [Anna Zivian, United States of America]	Noted - Moser's (2010) work on barriers is cited e.g., 4.4.3.2; as well as more recent work (e.g., 4.4.5).
200	4	125	56	123	57	Please add next to "(Dutra et al., 57 2015; Elrick-Barr et al., 2017)" also Fatorić and Seekamp 2017b. Their study also confirms that during the iterative workshop a social learning or co-production of knowledge occurred. [Sandra Fatoric, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. The limited space meant very careful selection of citations to support illustrative examples.
9685	4	126	4	126	19	These two sections could be linked, and there could be additional discussion on sharing best practices. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
29977	4	126	12	126	19	add a sharing best practices section or include concept here [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
6971	4	126	14	0		Suggest insert "the" before "USA" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6973	4	126	18	126	19	Sentences require a reference [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6975	4	126	25	0		Suggest change comma for "in" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6977	4	126	34	126	35	Sentence requires a reference [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6979	4	126	35	0		Suggest remove "needing" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
31293	4	126	37	126	51	This section seems to simply repeat parts of Section 4.4, but does not address the enabling element. [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
14041	4	126	41	126	45	What does 'legally defensible' refer to? That it is robust from private lawsuits? Please clarify. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
6981	4	126	42	0		Suggest remove "concept" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6983	4	126	44	0		Remove one "are" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6985	4	126	47	0		Suggest insert "the" before "Netherlands" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
9687	4	126	53	127	2	Citation needed. [Government of France, France]	Addressed in final revisions to FGD
23219	4	127	0	130		This is a quite descriptive section, could a table be used instead of this long list? [Valerie Masson-Delmotte, France]	Accepted - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
6987	4	127	1	0		Suggest remove "they use" and insert "are used" after "legislation" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
11055	4	127	18	128	22	The chapter details mainly reef restoration solutions. It is important to mention here the new methodologies of genetic ecological engineering centered on the potential of “assisted evolution” for the generation of thermally resilient corals (see for example: van Oppen et al. Building coral reef resilience through assisted evolution. PNAS 112, 2307-2313 (2015); Peixoto et al. Beneficial Microorganisms for Corals (BMC): proposed mechanisms for coral health and resilience. Front. Microbiol. 8 (2017)). [Denis Denis Allemand, Monaco]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
9689	4	127	26	127	28	Some specific examples here would be useful. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
20207	4	127	26	127	28	It may be elaborated little more. Only a sentence or two may be added to homogenize it with quantitaive theme. [APECS Group Review, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.
29979	4	127	26	127	28	give examples (recognizing that the referenced section does include some examples) [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
3039	4	127	37	127	57	The development of climate services is intended to resolve or partly resolve these four points. May be a link could be made to the broad litterature on climate services for (coastal) adaptation, especially to papers that have listed and analysed barriers (Brooks 2013; Vaughan and Dessai 2014; Monfray and Bley 2016; Brasseur and Gallardo, 2016; Le Cozannet et al 2017), also noticing that coastal climate services are among those with the strongest growth potential according to the survey of Cavelier et al. (2017). Brasseur, G.P.; Gallardo, L. Climate services: Lessons learned and future prospects. Earths Future 2016, 4, 79–89. Vaughan, C.; Dessai, S. Climate services for society: Origins, institutional arrangements, and design elements for an evaluation framework. Wiley Interdiscip. Rev.-Clim. Chang. 2014, 5, 587–603. Cavelier, R.; Borel, C.; Chareyron, V.; Chaussade, M.; Le Cozannet, G.; Morin, D.; Ritti, D. Condition for a market uptake of climate services for adaptation in France. Clim. Serv. 2017, 6, 34–40. Brooks, M.S. Accelerating innovation in climate services: The 3 e's for climate service providers. Bull. Am. Meteorol. Soc. 2013, 94, 807–819. Le Cozannet, G.; Nicholls, R.J.; Hinkel, J.; Sweet, W.V.; McInnes, K.L.; Van de Wal, R.S.W.; Slangen, A.B.A.; Lowe, J.A.; White, K.D. Sea Level Change and Coastal Climate Services: The Way Forward. J. Mar. Sci. Eng. 2017, 5, 49. Monfray, P.; Bley, D. JPI Climate: A key player in advancing Climate Services in Europe. Clim. Serv. 2016, 4, 61–64. [Goneri Le Cozannet, France]	Noted - this matter is indirecty addressed in Table 4.10. Word limits did not permit explicit focus on improving climate services but this is an aspect of efforts to improve the building of coupled scientific, local and indigenous knowledges.
29981	4	127	52	127	57	beyond economics, even harder [Anna Zivian, United States of America]	Accepted and addressed in FGD

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
202	4	128	7	128	7	Please add the importance of identified barriers and needs to overcome these barriers in climate adaptation and preservation of cultural heritage. Please add these sentences: Furthermore, a study by Fatorić and Seekamp (2017c) presents the first attempt to specifically document barriers to climate change adaptation for heritage preservation and identify strategies for overcoming those barriers. This study found that climate adaptation efforts for heritage preservation are impeded by institutional, technical and financial barriers, and that these three types of barriers are often interdependent. Principal among these barriers were institutional barriers related to climate adaptation planning processes, policy guidance, and management guidelines. Fatorić, S. & Seekamp, E. (2017c) Securing the future of cultural heritage by identifying barriers to and strategizing solutions for preservation under changing climate conditions. Sustainability, 9, 2143. [Sandra Fatoric, United States of America]	Rejected. As important as this point is, aspects of heritage and SLR are addressed elsewhere in the chapter (incl. 4.3.3.6.4), with work by the reviewer cited. Addressing this issue is implicit in how the enablers and lessons learned have been assessed and reported in Table 4.10.
6989	4	128	17	0		Suggest replace "on" with "in" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
2193	4	128	17	128	22	No evidence/citations in this paragraph [Robert Kopp, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
9691	4	128	17	128	22	Citation needed; also, while the section says “especially in the developing world context,” all three cases presented here are from developed countries. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
29983	4	128	17	128	22	citations needed, and none of these are examples from the developing world [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
31295	4	128	17	128	22	Lack of references [Hans-Otto Poertner and WGII TSU, Germany]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
14043	4	128	19	128	22	The examples provided are not developing nations and therefore this sentence appears to be misleading. Please re-consider the examples included. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
6991	4	128	56	0		Suggest insert "at" before "a" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
6993	4	129	3	0		Insert full stop before "Local" [Nina Hunter, South Africa]	Addressed in final revisions to FGD

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204	4	129	3	129	3	Please add: Fatorić and Seekamp (2017c) found in their study on barriers to climate adaptation and preservation in the U.S. that lack of funding is a considerable factor constraining preservation practice and policy for heritage preservation, particularly related to planning and implementing climate adaptation strategies. Fatorić, S. & Seekamp, E. (2017c) Securing the future of cultural heritage by identifying barriers to and strategizing solutions for preservation under changing climate conditions. Sustainability, 9, 2143. [Sandra Fatoric, United States of America]	See response to 2481.
6995	4	129	11	0		Suggest change "is" to "are" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
20209	4	129	29	129	29	"...maximum vaue??? [APECS Group Review, Germany]	Addressed in final revisions to FGD
9151	4	129	44	0		Suggest replace "it" with "such risks" [Nina Hunter, South Africa]	Addressed in final revisions to FGD
9693	4	129	53	129	54	A bit more detail here would be useful. [Government of France, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
29985	4	129	53	129	54	more explanation needed here [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
23223	4	130	0	131		Very nice FAQ. [Valerie Masson-Delmotte, France]	Thank you
23221	4	130	11	130	26	Is this a conclusion? Or an assessment without using references? No use of confidence language. [Valerie Masson-Delmotte, France]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
29987	4	130	11	130	26	assessments of likelihood and consensus would be useful here [Anna Zivian, United States of America]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.
20211	4	130	14	130	14	"..face of limited..." may be shape of or form of. [APECS Group Review, Germany]	Addressed in final revisions to FGD
20213	4	130	14	130	15	"Local government.....face of SLR"; This sentence make no sense. It may be rephrased or omitted. What is face of SLR? It may be started (by merging it with next sentence at line 15) as "Local government responses reflect both....." [APECS Group Review, Germany]	Addressed in final revisions to FGD
29361	4	130	27	0		Need to train and sensitize Third World countries to certain "eco-responsible" protection techniques, with a view to ending the "Hard" protections, or with new notions of strategic "retreat" [Walid Rabehi, Algeria]	Taken into account - substantial revisions to the structure and content of 4.4.5 have been made to better reflect local experiences in enablers and lessons learned in responding to SLR in both the Global North and South.Table 4.10 outlines the synopsis of this assessment. See citations.

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
11145	4	130	28	0		Section 4.4.7 Is still to be written, but there is no placeholder for a 4.4.6 section. [Valentina R. Barletta, Denmark]	Addressed in final revisions to FGD
15645	4	130	28	0		Section 4.4.7 Is still to be written, but there is no placeholder for a 4.4.6 section. [EUCE, Belgium]	Addressed in final revisions to FGD
9695	4	130	28	130	28	4.4.6 is missing [Government of France, France]	Accepted
20215	4	130	28	130	28	Where is 4.4.6? and when final draft will be placed at 4.4.7? [APECS Group Review, Germany]	Addressed in final revisions to FGD
29989	4	130	28	130	28	there is no 4.4.6 [Anna Zivian, United States of America]	Addressed in final revisions to FGD
32069	4	130	30	0		I missed the part on Climate Resilient Development pathways. This is very important for developing countries. The approach of adaptation pathways could als be used to explore development pathways, which could then be evaluated upon their contribution to climate resilience [Marjolijn Haasnoot, Netherlands]	Addressed in final revisions to FGD
16419	4	130	35	130	35	Can this question be rephrased? It is very odd to read as it is. "What challenges do affected coastal communities face due to sea level rise?" [Alexander Nauels, Germany]	Addressed in final revisions to FAQ
3181	4	130	35	131	30	The response to this FAQ presents important and interesting information but doesn't actually answer the question presented. The text primarily discusses how coastal communities can respond to challenges, but doesn't directly address the challenges that will result from sea level rise. It may be helpful to add a paragraph that explicity discusses potential challenges for coastal communities, or change the question in the FAQ. [Sloane Garelick, United States of America]	Addressed in final revisions to FAQ
11461	4	130	35	131	30	This FAQ seems to focus on the responses of coastal communities to sea level rise instead of the challenges they face. [Anson Cheung, United States of America]	Addressed in final revisions to FAQ
11463	4	130	37	130	51	These two paragraphs are talking about the same thing in two different ways, so it can be combined into one. [Anson Cheung, United States of America]	Addressed in final revisions to FAQ

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Comment id	Chapter	From page	From line	To page	To line	Comment	Chapter Team Response
16801	4	130	37	131	30	FAQ4.1: This FAQ needs to be substantially revised. In our understanding, FAQs are meant to convey and clarify concepts and relationsships underlying the assessment, in more accessible language than the main chapters. However, they should not summarize key findings of the report and must be carefully drafted to avoid prescriptive language. The current draft fails to explain concepts that would be helpful to understand challenges, e.g. how ESL are decisive rather than MSL for adaptation, or whether there are certain levels that are generally thought to be beyond adaptation, or how the rate of SLR interacts with adaptive capacity. Instead it provides recommendations about what has to be done, and makes strong value judgments. While we do appreciate the urgency that the text conveys, we do not think it is appropriate in the format of an FAQ. We'd therefore encourage the authors to revise the draft in a way that is less prescriptive and value-laden. Also, please make sure that the numbers reported on p 130 ln 44-47 are supported by the main report and that your wording is consistent with the glossary definitions (e.g. "hazard impact" (p 130 ln 50)). [Government of Germany, Germany]	Taken into account in revisions to FAQ
31409	4	130	44	0	49	Such wording and combination with confidence levels would be useful for the ES. [Hans-Otto Poertner and WGII TSU, Germany]	Noted, and taken into account in revised ES statements.
16421	4	130	44	130	51	Please provide either uncertainty ranges for these overly precise estimates or less precise information like 'around 0.2 m in the 20th century'. The latter would be better suited for a FAQ. [Alexander Nauels, Germany]	Addressed in revisions to FAQ
6997	4	131	2	0		Suggest inserting "on" after "depending" [Nina Hunter, South Africa]	Addressed in revisions to FGD
3179	4	131	4	131	23	The information presented here is interesting and important, but is somewhat dense and difficult to follow written as a list in paragraph form. It may be helpful to include a table or schematic here instead. [Sloane Garelick, United States of America]	Taken into account in revisions to FAQ; it was not feasible to include a figure in this FAQ due to space limitations.
11465	4	131	4	131	23	It might be more helpful to have a diagram/schematic in conjunction with the text for explanation. Right now, the text is hard to understand. [Anson Cheung, United States of America]	See response to 3179
14045	4	131	6	131	7	The text states ''Hard protection', like seawalls, can hold back the sea up to a point', to be consistent with the text elsewhere in the chapter this should also refer to a reduction in risk. [Government of United Kingdom (of Great Britain and Northern Ireland), United Kingdom (of Great Britain and Northern Ireland)]	Accepted and reflected in revised FAQ

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21891	4	131	12	131	13	Phrase "residual risk remains .." implies residual risk is static - however as hazard exposure increases with ongoing SLR, the residual risk, relative to the existing development, of protection measures will increase over time. [Robert Bell, New Zealand]	Taken into account in revisions to FAQ - residual risk has been removed.
21893	4	131	15	0		Retreat may not eliminate the risk depending where retreat to occurs - so qualifier should be added "only way to minimize or eliminate such risk.." [Robert Bell, New Zealand]	Taken into account in revisions to FAQ.
22789	4	132	1	174	60	Typo: a series of submitted / under review references have no inidication of journal. Edwards et al. 2018; Hinkel et al., in review Horton et al. In press Melet et al., in review Pollard et al., 2018 [Jeremy Rohmer, Finland]	Addressed in final revisions to FGD
24111	4	132	32	132	32	Aertz: Please add vol and pages: 7, 315-316. [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24113	4	132	34	132	34	Aertz et al: Please remove "1" and add vol and pages: 8, 193–199 [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24115	4	132	51	132	51	Albert et al: please add paper number (no page number): 094009 [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24117	4	135	15	135	15	Bindoff et al: Please add "Chap. 5, In: Climate change 2007, IPCC report" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24119	4	135	55	135	55	Bridges et al: Proceedings "Flood & Coast 2018", 20-22 March 2018, Telford, UK [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24121	4	136	37	136	37	Burch et al: Please give additional precisions on volume and issue: "4 (1)" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24123	4	137	14	137	14	Campos et al: please add paper number "13" in this volume [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24125	4	137	29	137	29	Carson et al: please add "Vol 122, issue 11, 9068-9091" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24127	4	138	4	138	4	Chang et al: please add "Geophysical Research Letters, 43 (5)" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
4255	4	138	14	138	15	Incomplete reference. [Josep Ramon MEDINA, Spain]	To be addressed in final proofing of FGD.
24129	4	138	15	138	15	Cheng et al: Please add volume, issue and pages: "4 (1), 156-163" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24131	4	139	25	139	26	please check: "on demand"? [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24133	4	139	63	139	63	Dangendorf et al: please add article number: 7849 [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24135	4	140	22	140	23	de Boer et al: Please add volume, issue and pages: "44 (20), 10,486-10,494" and remove "n/a-n/a" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24137	4	140	43	140	44	de Winter et al: please add volume, issue and pages: "17 (12), 2125-2141" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24139	4	140	53	140	54	Deng et al: Please add volume and pages "171, 254-271" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.

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24141	4	140	55	140	56	Denton et al: please add "Chap. 20, Contribution of WG2 to the 5th Assessment Report of the IPCC, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA". [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24143	4	141	40	141	41	Donchyts et al: Please add volume, issue and pages: "6 (9), 810-813" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24145	4	141	62	141	63	Duvat et al: Please add volume, issue and paper number: "8 (6), e478" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24147	4	143	36	143	37	Ferrario et al: please add article number: 3794 [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24149	4	146	34	146	35	Gugliotta et al: please add "doi:10.1111/sed.12489 " (paper not yet included in an issue) [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24151	4	146	54	146	55	Hamilton et al: please add volume and pages: "8, 240–244" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24153	4	148	22	148	23	Hewitson et al: please add "Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of WG2 to the 5th Assessment Report of the IPCC, United Nations Environment Programme, New York, 1133-1197." [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24155	4	150	24	150	24	Jimenez-Cisteros et al: please add "In: Field, C. B., Barros, V. R., Dokken, D. J., Mach, K. J., Mastrandrea, M. D., Bilir, T. E., Chatterjee, M., Ebi, K. L., Estrada, Y. O., Genova, R. C., Gimma, B., Kissel, E. S., Levy, A. N., MacCracken, S., Mastrandrea, P. R. and White, L. L. (eds.) Climate Change 2014: Impacts, Adaptation and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, pp. 229-269." [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24157	4	154	27	154	28	Please change into: "Lincke, D. and J. Hinkel (2018). Economically robust protection against 21st century sea-level rise. In: Global Environmental Change 51, pp. 67–73. DOI: 10.1016/j.gloenvcha.2018.05.003." [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24161	4	154	33	154	33	Linham and Nicholls: please check the reference. On internet, I found: "Zhu, X, Linham, MM & Nicholls, RJ 2010, Technologies for Climate Change Adaptation - Coastal Erosion and Flooding. TNA Guidebook Series, Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi, Roskilde, Denmark" Reference to be completed and to move? Please pay attention as well at its quotation in the text [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24165	4	155	5	155	5	Luijendijk et al: please add paper number: "6641" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.

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24167	4	155	19	155	20	MacDonald et al: please add doi: "10.1016/j.ecss.2017.09.007" (paper not yet assigned to an issue) [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24169	4	155	19	155	20	Mcowen et al: please add volume and article number: "5, e11764" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24171	4	158	38	158	39	Morim et al: please add volume and page numbers: "167, 160-171" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
21895	4	159	47	159	48	NZ Government guidance reference would be more accessible if URL provided: http://www.mfe.govt.nz/climate-change/technical-guidance/guidance-local-government-preparing-climate-change [Robert Bell, New Zealand]	To be addressed in final proofing of FGD.
24173	4	161	28	161	29	Ouillon: please remove "Multidisciplinary Digital Publishing Institute" and replace by: "Water, 10, 390" (if needed, doi:10.3390/w10040390) [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24175	4	164	8	164	9	Renner et al: please add volume and pages: "27, 470-479" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24177	4	164	8	164	9	Scambos et al: please add volume and pages: "153, 16-34" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24179	4	166	31	166	32	Seroussi et al: please add volume and pages: "44 (12), 6191-6199" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24181	4	169	15	169	16	Tedesco et al: please add paper number "11723" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24183	4	169	26	169	27	Tessler et al: please add volume and pages: "305, 209-220" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24185	4	170	3	170	4	Trenberth et al: please add volume, number and pages: "6 (5), 730-744" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.
24187	4	174	59	174	60	Zcheischler et al: please change volume number and add pages, following: "8, 469-477" [Sylvain Ouillon, France]	To be addressed in final proofing of FGD.