The handling editor thanks the authors for their submission of Chapter 2 "Sea Level Rise in Europe: observations and projections" and for their revisions of the paper based on feedback from two anonymous reviewers and three community comments. The authors have addressed the reviewers comments satisfactorily either by following the reviewers suggestions or convincingly arguing why they decided not to.

Based on my review of the revised manuscript, I recommend that this manuscript requires minor corrections before finalization. The corrections I suggest are mainly related to improving clarity and detailed below.

We thank the handling editor for the extra corrections suggested to improve the paper.

1 Introduction

L81: icesheets -> ice sheets
Done

2 Summary of previous assessments

L133: I think the two references can be in the same parentheses.
Indeed, done.

3 Regional observations

Figure 3, caption: the caption is referring to panel a and b but as far as I can see, the panels are not labelled. I suggest changing to left and right. Also, there is no "top right".
Thanks, this has been corrected.

Figure 4, caption: you refer to Figure 3b but there is no "b" in Figure 3.
Thanks, this has been corrected.

L301: sea level dynamics ARE highly...
Corrected, thanks.

Figure 5: Referring to a comment by Rev2: You do not refer to the two periods shown in Figure 5. I would ask you to explain them in the caption and add a sentence in the text to highlight the changing decadal trends.
The caption of Fig 5 has been updated to:

Figure 5: Global mean SL measured by satellite altimetry since 1993 (red curve), shaded area represents the uncertainty and the dotted line shows a trend line with an acceleration. The annual and semi-annual periodic signals are removed and the timeseries is low-pass filtered (175 days cut-off). The timeseries is corrected for GIA using the ICE5G-VM2 GIA model (Peltier, 2004) to consider the ongoing movement of land. Over 1993-1998, global mean sea level is corrected for the TOPEX-A instrumental drift, based on comparisons between altimeter and tide gauges measurements (Ablain et al., 2017; Legeais et al., 2020). Over 1993-2022, the GMSLR trend is 3.29±0.33 mm yr^{-1} (uncertainty at 90% confidence level) and the GMSLR acceleration is 0.11±0.06 mm yr^{-2}. Trends are also reported for the period 2001-2011 and 2011-2021 to highlight the changing decadal trend of global mean sea level. The shaded envelope indicates uncertainties (17th-83rd percentiles). Data source: EU Copernicus Marine Service product (2019): Ocean Monitoring Indicator based on the C3S altimetric SL product. Credit: C3S/ECMWF/Copernicus Marine.

L378: time -> temporal

Done.

L380: I think it would be useful to explain what you mean by "relative measure of VLM". Relative to what?

Repeat levelling determines changes in elevation across a network of points. In that way you can say that these measurements are made relative to themselves. By making repeat measurements, VLM can be determined across the levelling network. This is different to GNSS which is an "absolute" measure of VLM, as measurements are made in a geocentric reference frame (ITRF).

To improve its clarity, the sentence "*Historically, repeat levelling has been the main technique and gives a relative measure of VLM*" has been rewritten to:
"*Historically, repeat levelling has been the main technique. It determines changes in elevation across a network of points and gives a measure of VLM across the levelling network. The repetition of levelling also provides VLM measurements relative to past ones* ».

L433: Calafat et al. (2022) determined ... (remove "has")
Done.

Section 4 Drivers of sea level rise and extremes

I would suggest distinguishing more between past and present drivers and projected drivers. This section does a little bit of both. Section 4.1 covers the past and projections (ice sheets only), section 4.2 mostly the observational period and section 4.3 seems to be period-independent.

Section 4.1 could be shortened by moving the part on projections to section 5, particularly the last paragraph on ice shelf collapse.

We decided to dedicate Section 4 to processes and drivers of SLR and extremes, while Section 5 rather assesses projected SLR and extremes, although we acknowledge some overlap. As such, in Section 4, both the past and future periods can be tackled, depending on processes (such as ice sheets instabilities).

L463: Fig. 2.8b → Figure 8b
Done.

L464: make about → account for
Done.

L469-470: suggest rewriting to: The role of atmospheric dynamics is also uncertain.
Done.

L482: Figure 8c
Done.

L487: MICI has not yet been defined.
The sentence has been updated to : "Fox-Kemper et al. (2021) assess the Antarctic contribution to global mean SLR in 2300 (without **Marine Ice Cliff Instability possible**

contribution, see section 5.2) to range between –0.14m and +0.78m (17-83th percentiles) for a low emission scenario (SSP1-2.6, and to range between –0.28m and +3.13 m for a very high emission scenario (SSP5-8.5)."

L521: I think you can remove "which are the changes in the amount of water stored on land"
Done.

L529: replace "is" with "are"
Thanks, corrected.

L535: icesheets -> ice sheets
Done.

Figure 9, legend: what is GMOM?

The caption of Figure 9 has been updated to :

Figure 9: Global mean SL (GMSL) budget from 2006 to 2021. Global mean SL is estimated by satellite altimetry (black curve, data from the Copernicus Marine Environment Monitoring Service). Global mean ocean mass (GMOM) change (sum of ice sheet mass loss, glaciers ice melt and land water storage changes) is estimated from GRACE and GRACE-FO (blue curve, data taken from the JPL, CSR, GSFC mascon solutions). Global mean thermosteric sea level (GMTSSL) change is estimated from Argo (Green curve, data taken from an ensemble of the NOAA, EN4, SCRIPPS and JAMSTEC Argo product). From Barnoud et al., 2021.

Section 5 Projections of sea level rise...

L656-657: "Figure 11 regional SLR projections..." the first part of this sentence reads strange.

This sentence was updated to: "Figure 11 indicates the first decade in which the median projected regional SL change over European Seas has crossed a certain threshold (0.5, 0.75, 1.0 m above the 1995-2014 baseline) under two emissions scenarios."

Figure 11, caption: you refer to a, b, ... e, f but I don't see the numbering in the panels.

Labels a, b, …e, f were added in panels of Figure 11.

L702: Is there an "and" missing between the references?

Added.

L704: ABUMIP? It is in the list of acronyms but only mentioned once. Consider writing it out.

Done.

L738: replace "certain" with "selected return heights"? (If this is what you mean here) – I think the concept of amplification factor could benefit from an example.

This sentence has been reformulated to:

"Projections of future changes in ESLs due to SLR are often reported through so-called amplification factors, which correspond to the change in the expected frequency of a given contemporary ESL height under climate change scenarios (…)"

The following sentence, which provided an example for the amplification factor of the ESL with a return period of 100-yr, has been expanded to provide a more direct link to the amplification factor concept:

"For instance, the IPCC AR6 (Fox-Kemper et al., 2021) projected that the SL associated with the historical centennial event, which is the event that historically had a 1% chance of occurring each year (once per century on average), will be exceeded at least annually (i.e. corresponding to an amplification factor of 100) at 19-31% of 634 tide gauges worldwide in 2050, and at 60-82% in 2100."

In L745-746 you mention the "amplification factor of the frequency of ESLs" as opposed to "probability of ESLs" in L738. While I think I understand, it might be confusing to some readers.

Line 738 has been rewritten. The new text avoids confusion with lines 745-746 as it does not mention "probability of ESLs" anymore.

Figure 12 caption: can you give a brief description of what the amplification factor means? I agree with Rev2 that this could be useful.

We updated the caption to:

Figure 12: Amplification factors showing the expected change of frequency **of the historical centennial SL event in 2100 projected by the IPCC AR6, for Europe, under the SSP2-4.5 middle-of-the-road emission scenario (obtained from Fig. 9.32 of Fox-Kemper et al., 2021).** In this figure, an amplification factor of 10 means that the historical centennial SL event will become a decennial event in 2100, while an amplification factor of 100 means that the historical centennial SL event will become an annual event in 2100.

Figure 13: Add information about which scenario is used (low probability?). And I guess the changes are associated with storm surges, waves AND MSL changes?

The caption of Figure 13 has been updated to:

Figure 13: Projected changes in the height of ESLs associated with storm surges and waves only under a worst case scenario (95th percentile of the centennial event, corresponding to a return period of 0.01 yr^{-1}) **by 2100 relative to 1980-2014 along the European coastline (adapted from Fig. 3 of** Jevrejeva et al., 2023, using data from Vousdoukas et al., 2018).

We confirm that the changes are only associated with storm surges and waves in this figure (corresponding to Fig 3 of Jevrejeva et al. 2023, as stated in the caption).

Section 6 Key developments per region

The newly added introduction to this section is a great improvement and serves as a central thread to the subsections. Well done.

Thank you.

I only have a few suggestions that hopefully improve clarity.

- The basin-averaged sea level for reconstructions and projections is formed over the coloured areas shown in Figure 14, correct? That is, they are not averages over coastal sea level as shown in Figure 15-19b and c?
  Indeed, as indicated in the caption of Fig 15-19a, the reconstructed <u>basin average</u> (Figure 14) mean relative SL is shown in these panels. The captions of Fig 15-19 have been updated to account for your other comments (see below).

- Following a comment by Rev2, I think it is worth mentioning explicitly that the reconstruction still contains GRD effects due to present day barystatic mass changes, thus justifying calling the RSLR instead of geocentric SLR.
  This is now clarified in the text, see the answer to your next comment.

- Is it correct that GIA is removed in the reconstruction but not in the projections shown in Figures 15-19a? If so, I would ask the authors to consider removing GIA from the projections, too, for consistency or, alternatively, show the reconstruction with GIA. Either way, please clearly state for both, reconstructions and projections, whether they are shown with or without GIA.
  Thanks for pointing this out. We corrected the text to improve the clarity regarding the account of GIA in Figures 15-19a.
  In the introduction of Section 6, the sentence:

  "In addition, Figures 15 to 19 provide, for each regional sea, basin-averaged relative SL (but GIA effects are not included) over 1900-2014, basin averaged projected multi-model ensemble mean relative SL until 2100" has been updated to: *"In addition, Figures 15 to 19 provide, for each regional sea, basin-averaged relative SL (**with GIA and GRD effects being included**) over 1900-2014, basin averaged projected multi-model ensemble mean relative SL until 2100".*

  The sentences *"Note that in Figures 15-19, relative SL shown is after removal of GIA effects. In addition, the vertical reference of the reconstructed relative SL timeseries has been adjusted to match projected mean sea level records, as it is arbitrary"* have been updated to:
  *"~~Note that in Figures 15-19, relative SL shown is after removal of GIA effects.~~ **In Figures 15-19, reconstructed relative SL with the effect of GIA (and GRD from contemporary mass loss of land-based ice) are shown.** In addition, the vertical reference of the reconstructed relative SL timeseries has been adjusted to match projected mean sea level records, as it is arbitrary."*

  Finally, the captions of Fig 15-19 have been updated to: *"Figure 1[5-9]: (a) Yearly reconstructed basin average (Figure 14) mean relative SL over 1900-2014 from Dangendorf et al. (2019) **with the effect of GIA and GRD from contemporary mass loss of land-based ice,** together with basin average projected multi-model ensemble mean relative SL until 2100 and relative to 1995-2014 under SSP1-2.6, SSP2-4.5 and SSP5-8.5. Shadings indicate the 17th-83rd percentile uncertainties under SSP2-4.5 and SSP5-8.5. **Projections were obtained from AR6 IPCC accounting for VLM (including GIA) effects.** (b) Linear trends of VLM over 1995-2020 (Oelsmann et al., 2024). (c) 50- year return levels of extreme still water levels representative of the recent past from (…)."*

- Table 3: What about the North Sea? GIA has a relatively large impact in its northeastern part along the Norwegian coast.
  We decided to show the basin-averaged rates for the European Seas that are the most impacted by GIA, i.e., the European Arctic and Baltic Sea.

Figure 15-19, captions: since the subpanels are labelled a, b and c you can use that in the caption as well (instead of top, lower left, lower right). As a consequence, I would also ask the authors to refer to e.g. Figure 15a,b,c when appropriate.

Indeed. Captions of Figures 15-19 were updated (see above) and panels are referred to (a), (b) and (c), throughout the manuscript.

6.1 Atlantic Ocean

In general: north-eastern -> northeastern

Done (as well for south-eastern, north-western, north-east, etc.)

L911: Figure 15b.

Done.

L928: Refer to Figure 15c somewhere in this paragraph? Figure 15 is only mentioned very generally in the end. I suggest you move this last sentence of the paragraph higher up!

The last sentence of the paragraph "Extreme still water levels over the recent past range from 1-2 m for the coast of Portugal to 7-8 m in the macrotidal Bay of Mont Saint Michel (France) (Figure 15)" has been moved higher up and modified to the following one, with an explicit reference to Figure 15c:

"The 50-yr return period extreme still water levels over the recent past range from 1-2 m for the coast of Portugal to 7-8 m in the macrotidal Bay of Mont Saint Michel (France) (Figure 15c)."

L966: One parenthesis too many in the reference.
Done.

L999: "ones of the world regions" → two regions
This sentence has been rewritten to :

"The English Channel and the Irish Sea are amongst the world regions where tides would change the most substantially in response to SLR"

L1004: e.g,, -> e.g.,
Thanks, corrected.

6.2 North Sea

L1046: should this be "relative" SL?

Yes, added.

L1049: Several...

Corrected, thanks.

L1054: Refer to Figure 16b somewhere in this sentence.
Added at the end of the sentence.

L1084: raise → change or affect? Variability or negative trends may also lower the baseline.
The sentence has been rewritten using "influence".

L1142: Remove comma after Lobeto et al. for consistency with subsequent references.
Done.

6.4 Mediterranean Sea and Black Sea

L1313: Figure 18, top panel → Figure 18a
Done.

6.5 Baltic Sea

Figure 19a: are you sure you are plotting the reconstructed sea level WITHOUT GIA? To me, it seems that the trend is negative, certainly for the entire period but also for 1950-2014 when it should be positive according to Table 3 (Baltic no-GIA)
This has been corrected, thanks.

7 Conclusion

L1566: south-eastern -> southeastern (for consistency with northeastern used higher up in this section)
Done.