

Anonymous Referee #2

The paper presents impacts of an asymmetric probability distribution of ice sheet dynamics on regional sea level projections using mass loss distributions of ice sheets from three studies. The topic is relevant for adaptation decision making as not only estimates of sea level rise need to be taken into account but also the uncertainties of these assessments. The paper is clearly written. I read it with great interest. I recommend to accept the paper with some minor revisions:

1. From the paper it was not clear to me what is/are the reasons for assuming an asymmetric distribution (p2 lines 21-27). What are the physical processes that make this plausible? Ice cliff instability? What is causing the shift from median to asymmetric distributions (page 4 first line)? New assumptions? What are they? It is addressed in the discussion, but I would like to have read it in the introduction

The following sentence is added:

“This is due to non-linear behaviour of the ice dynamics and ice shelf collapse, and the possibility for a threshold affecting the rate of decay of the ice sheet-shelf system.”

Regarding your question “What is causing the shift from median to asymmetric distributions”, the new studies cited in this particular line contain two elements: 1. a shift in median (50th percentile) and 2. a different shape. The sentence has been changed to make this more explicit to:

“These new studies differ in median (indicated by the 50th percentile in the right column of Fig. 1) and asymmetry (shape of the PDF)”

2. Page 3 line 17, where you describe the objective of the paper. Maybe change this into: ..by comparing the impacts of probability distributions of...

Thank you for addressing the issue, the objective can indeed be better formulated. In the new manuscript this is changed to:

“The main objective of this paper is to analyse the sensitivity of higher percentile of regional SLC projections to asymmetric probability distributions for dynamical ice sheet mass loss. This is done by comparing the impacts of the probability distributions of Church et al. (2013), De Vries and Van de Wal (2015) and Ritz et al. (2015) on high-end regional SLC projections.”

3. Line 16 is confusing. Reinterpretation and using data (of what?) from .. is vague. I would remove the sentence here and explain in method section.

In line with the reply on the previous comment (2), the sentence the reviewer is referring to can be removed. Since this information is now included in the new sentence. We agree with discussing the reinterpretation only in the method section.

4. A flowchart/diagram showing the data used and the calculations made could improve understanding the method and the contribution of this paper in comparison to other studies. For example like fig 1 in Kopp et al 2014 10.1002/2014EF000239

Thank you for this suggestion. We added a flowchart to provide more insight in the computations.

5. Could you explain why the difference in higher percentiles will be amplified (page 9 line18)

Calculating global average SLC to regional SLC-patterns results to an above global-average increase in sea level, in locations in the far field of an ice sheet. This sentence is rephrased: "...the differences in higher percentiles will be amplified for locations in the far field of an ice sheet."

6. Figure 1 is 2100 and the other figures for 2090, why?

Figure 1 is based on the data as presented in the cited studies. The Slangen et al. (2014) study covers 2080-2100. In order to match the contribution of dynamical ice sheet mass loss to SLC to these regional projections, the data is within the Seawise program converted to 2090, as explained in line xx

7. Would be great if there could be a dynamic figure with maps, where you could click on and see a graph like figure 3

We agree that this would be nice; we will keep it in mind for future projects. Within this study we extended the number of locations in Figure 4. We are open to provided more detailed data on request.

Other comments

8. Page 8 line 16→remove one (

Thank you for the suggestion, this is changed

9. References: make consistent: De Vries or de vries

Thank you for the suggestion, this is changed

10. Add reference to Le Bars et al 2017 where you give example of symmetric pdfs

done