Ocean Sci. Discuss.,
https://doi.org/10.5194/os-2019-65-AC1, 2019

Ocean Science
Discussions

Interactive comment on "Extreme Sea Levels in the Baltic Sea under Climate Change Scenarios. Part 1: Model Validation and Sensitivity" *by* Christian Dieterich et al.

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Received and published: 9 August 2019

Answers to referee #1

Thank you for your comments and suggestions. We think it helped to improve the manuscript.

Page 1 line 20 - What is "Backafloden"? This should be either removed, or explained.

- Backafloden is the Swedish name for the storm surge in November 1872 that flooded a number of cities in the southwestern Baltic Sea with record sea levels. We have described the event in a sentence and avoided the name Backafloden.

Page 4 line 31 - Which storm surge model is being referred to here?

- The name of the storm surge model is NOAMOD. It is used at the SMHI for generating high frequency variability in the northern North Sea for the sea level forecast models. We have added a sentence to the text about NOAMOD. Unfortunately, there is no reference that could be cited.

Page 7 Table 2 and related text - what is "ORAS4"?

- ORAS4 is the previous Ocean Reanalysis System evaluated in e.g. Balmaseda et al., 2013. We have now included the reference in the text and in the caption, together with the explanation of the acronym.

Page 9 line 14 - What is the "WISKI network"?

- In this and most other cases we have replaced "WISKI database" or "WISKI network" with "tide gauge network". The name WISKI appears now only together with the reference to SMHI's open data.

Figure 1: The text labels are quite difficult to read here. ...

- We have moved the labels for the stations into free spaces on the map. The caption now mentions that the ensemble mean consists of the historical periods of the scenarios in Table 1.

- Figure 1b now contains labels for the different basins of the Baltic Sea instead of the station names. This is to accommodate a suggestion of reviewer #2.

Figures 2–8: These figures are all very similar to each other ...

- We agree. We have added a short characterization of the figures at the beginning of the captions. Figures 2 to 8 include now the station names.

Is there a reason that Figures 3–6 show only 3 stations but the others show 9?

- The three stations were meant as characteristic examples for the Bothnian Bay, Baltic

Proper and the west coast. The only reason to reduce those figures to three panels was to save space and text. We show now nine stations for all figures. The descriptions of the figures in the text have been expanded to include some sensitivities of the new figures.

Figure 8: The black line (observation 99.9

- We have adapted the caption of Figure 8.

References:

- Balmaseda, M. A., Mogensen, K., and Weaver, A. T.: Evaluation of the ECMWF ocean reanalysis system ORAS4, Q J Roy Meteor Soc, 139, 1132-1161, https://doi.org/doi:10.1002/qj.2063, 2013

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