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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Brief communication: Characteristic properties of extreme wave events in the Baltic Sea" *by* Jan-Victor Björkqvist et al.

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Response to review comments by A. Semedo

Thank you for the informative and constructive comments. We will now answer the comments point by point.

General comments

"The title might direct the readers to a climactic study, which is not the case, since the detailed characteristics of extreme waves in the Baltic Sea are not presented. I would

like the authors to defend their point of view on this matter."

This is a fair point, since the title doesn't accurately reflect that the analysis is based (mainly) on point observations from one location. The title has been changed to "Brief communication: Characteristic properties of extreme wave events observed in the northern Baltic Proper, Baltic Sea".

"The manuscript is, in general, well written, and the ideas are well presented and well defended. Nevertheless, it lacks depth, which can be explained by the "short communication" format. Nothing against. Just that this subject and idea deserves a more detailed analysis."

It is true that the format of the "brief communication" limits how deeply the performance of the operational model can be validated. We chose this format since it seemed like the most suitable and efficient format for reporting the findings inspired by the current storm Toini. We had two main reasons for reporting the findings: 1) the storm Toini is interesting in regards to the location of the maximum wave heights and it's long duration, 2) the storm generated wide interest both in Finnish and Swedish media. However, the main interest in the general public was almost solely on "the height of the single highest wave". The somewhat "simplistic" nature of the work is a result of it being inspired by the popular interest and our willingness to be able to communicate information about storm events in a more sophisticated, yet understandable, way. We hope that the work presented in this paper can serve as material for a discussion about wave warnings in enclosed seas, especially in the Baltic Sea.

"Here and there some references to back some statements are needed. Some suggestions are made below, but I challenge the authors to read the paper again and make their own review on this matter."

We will add references to statements concerning to model performance and previously obtained results about wave conditions. Added references are Jönsson et al. (2003), Tuomi (2008), Räämet Soomere (2010) and Eerola (2013).

Minor comments and suggestions on the text

"P1, L9 – Replace "in" with "along""

This will be replaced

"P1, L10 – extreme conditions of what?"

Will add the word "wave" to clarify that the sentence is regarding extreme wave conditions.

"P1, L12:Add reference after sub-basins"

We will a reference to Tuomi et al. (2011), since it is one previous study to support this assertion. We will also add other references to the next sentence starting "earlier studies have shown...".

"P1, L17 – estimated? Modelled, maybe."

This is the estimate that was made by Soomere et al. (2008). The authors used both model data and wave measurements to produce a best estimate of the highest significant wave height.

"P2, L21 – The present resolution of the WAM setup in the FMI operational wave product is 4 nautical miles? Since this is not a very common scale (unit) maybe it should be explained."

Will add the resolution in km also.

"Replace "timestep" with "temporal resolution". "

Will replace this in the text.

"P2, L28 – affects how. I presume it improves."

We will change the text to indicate that the accuracy has been increased and add a

reference to Eerola (2013).

"P3, L3-4 – Sentence starting with "Of the ..." is confusing. Re-write."

This sentence can be rewritten as:

The NBP wave buoy has measured a significant wave height of 8 m only twice (2004 and 2017). During the other three storms the measured maximum has been under 7.5 m (Table 1).

"P3, L15 – Erase "the" before "other"."

Will erase the word "the"

"P4, L3 – What is a "vast low pressure"? This sentence is out of context."

"Vast" was used in the meaning that is covered a large area. However, we take the point that is is perhaps not well defined, and we removed the word "vast", since it's not necessary. The sentence is a part of the description of the atmospheric conditions during the storm. We can rewrite the two sentences to make this clearer and feel it will then be in context:

"On 10–12 January a low pressure area was situated over the Norwegian Sea while a deepening secondary low formed over southern Scandinavia (see Fig. 1). The secondary low moved northwards along the east coast of Sweden."

"P4, L10 – Replace "was" after "maximum" with "occurred at"."

This will be replaced in the text.

"P4, L13 – How come mean?"

The reported steepness is a mean steepness in the sense that it is calculated as a temporal mean. It is defined on P1, L16-18. We will add the information to the text that it is the mean calculated for the 6 meter exceedance time. We will also clarify that the sentence describes to predicted value.

"P5, L3 – Add “speed” after “wind”."

This will be added.

"P5, L9 – Replace “was” with “occurred”."

This will be replaced in the text.

"P5, L15 – merge this sentence with the previous paragraph."

This will be merged in the text.

Other changes

Will add that the measurement history is 20 years, P1, L15.

Will correct “east-southeast” to “south-southeast”, P1, L18.

Will correct the word “Rafel” to “Rafael” P2, L5.

Will add that Bogskär is an FMI weather station, P2, L14.

New references

Jönsson, A., Broman, B., and Rahm, L.: Variations in the Baltic Sea wave fields, Ocean Eng., 30, 107 – 126, doi:http://dx.doi.org/10.1016/S0029-8018(01)00103-2, 2003.

Tuomi, L.: The accuracy of FIMR wave forecasts in 2002-2005, MERI – Report Series of the Finnish Institute of Marine Research, 63, 7–17, 2008.

Räämet, A. and Soomere, T.: The wave climate and its seasonal variability in the northeastern Baltic Sea, Estonian J. Earth Sci., 59(1), 100–113,

doi:10.3176/earth.2010.1.08, 2010.

Eerola, K.: Twenty-One Years of Verification from the HIRLAM NWP System, Weather and Forecasting, 28, 270–285, doi:10.1175/WAF-D-12-00068.1, 2013.

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