

Nat. Hazards Earth Syst. Sci. Discuss., author comment AC1
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Reply on RC1

Xin Liu et al.

Author comment on "Still normal? Near-real-time evaluation of storm surge events in the context of climate change" by Xin Liu et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-75-AC1>, 2021

We appreciate the constructive comments of the reviewer. They helped us to clarify and improve our manuscript. In the following, we show how we will address the points raised by the reviewer in the revised manuscript.

In the general discussion of the manuscript, the reviewer wonders whether a scientific journal would be the right place to present and discuss the developed service. We argue, that our manuscript describes and establishes a new method, which is well within the scope of a scientific journal. More specifically, we chose Natural Hazards and Earth System Sciences as journal, as its scope includes

- *"the detection, monitoring, and modelling of natural phenomena, and the **integration of measurements and models for the understanding and forecasting of the behaviour and the spatial and temporal evolution of hazardous natural events as well as their consequences;**"*

and

- *"the design, development, experimentation, and validation of **new techniques, methods, and tools for the detection, mapping, monitoring, and modelling of natural hazards** and their human, environmental, and societal consequences;"*

From our perspective, the storm surge monitor and our manuscript are fully in-line with these points and the scope of the journal.

However, we agree with the reviewer that our points were not made clear enough to be easily taken up. We will re-write the manuscript to make these points clearer and more explicit. Specifically, we will follow the suggestion of the reviewer and shorten the suggested parts (section 3) and extend our efforts to explain the approach and to interpret the data.

The specific points of the reviewer will be addressed as follows:

- Lines 94, 121: The typos will be corrected.
- Line 223: We agree that the choice is somewhat arbitrary. We checked and found that no events occurred for which this de-clustering had an effect. We will remove this part from the text and the analysis.

- Line 227: Will be modified as suggested.
- Lines 279/280: We will follow the suggestion and adopt captions throughout the manuscript and shift general discussions and descriptions into the text.
- Line 289: The typo will be corrected.
- Line 299: The text will be changed accordingly.
- Lines 308, 313 (318), 328, 371, 384 (386): Will be corrected as suggested.
- Lines 386-388: We agree with the reviewer. We will add references and extend the discussion in the revised manuscript.
- Lines 486-488: The reviewer is right that heights were modest. But the results from the cited literature showed that particularly a series of events even of modest height may challenge coastal protection. We will be more explicit about this in the revised manuscript.
- Lines 523-527: Mean sea level is rising in the Baltic Sea but does show a strong spatial gradient with smaller values along the German Baltic Sea coast (see e.g., <https://doi.org/10.3389/fmars.2021.647607>). Moreover, there is strong decadal variability in sea level trends and large interannual and decadal variability. We will discuss this in the revised manuscript and put the statements into context.
- Lines 560-562: We will take up this point raised by the reviewer and extend the discussion accordingly.
- Line 567: The text will be revised accordingly.
- Lines 571-573: We will carefully check the manuscript for repetitions and remove them where not required within the context.
- Lines 580-583: As stated in the text, the increase described in cited literature was not significant. The same line of reasoning as above (see reply Lines 523-527) should hold. We will introduce a corresponding discussion in the text.