

Interactive comment on “A validation of an operational wave and surge prediction system for the Dutch Coast” by L. Sembiring et al.

L. Sembiring et al.

l.sembiring@unesco-ihe.org

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First of all, we would like to thank the reviewer for the valuable comments and suggestions on our paper. We are grateful that based on the reviewer comments, we are able to improve the manuscript by exposing the most important breakthrough of the proposed CoSMoS modeling system, namely the coupled wave and tide-surge approach in a relocatable system. From the overall reviewer's comments, we have grouped them in several points. In the following, we present each point of the comments followed by our responses.

1.RC: The manuscript lacks a discussion that indicates, at the simplest level, if the results are good or if the errors are so large that the model cannot be used for monitoring

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activities.

AC: The model results are good to very good. Errors are low, and within the range of studies by e.g. Brown et al. (2010) for Irish Sea and by Ferrarin et al. (2013) for Mediterranean Sea which are using a similar coupled wave-tide-surge approach. We have added more 'discussion' lines into the manuscript where we make comparison between CoSMoS error metrics and the two studies above.

2.RC: Are they 'good enough' to monitor or to predict coastal flooding?

AC: The proposed model system is meant for providing regional model from which boundary conditions can be provided for models along the Dutch Coast. To assess the skill of the model on coastal monitoring, for instance coastal flooding, we believe a separate dedicated work is required which focusing on nearshore region and the processes. Here in this paper, we present a validation of the tool in which boundary information can be provided to such nearshore models.

3.RC: How important is the underestimation of the swell component? Add more details on shortcomings need to be urgently tackled by researchers.

AC: Lower frequency part of the total wave energy can be an important component for both daily normal conditions and storm periods. For daily normal conditions, several studies use swell component height as one of the parameters in their statistical prediction system of rip currents, which were built based on the correlation between wave conditions and number of beach rescue due to drowning (Lushine, 1991; Lascody, 1998; Engle, 2002). Moreover, during storm events, lower frequency waves are also one of the important parameters governing the over-topping and run up. This opens door for future works on improving the wave model as well as the swell boundary. We have added this explanation into the Result and Discussion section accordingly.

4.RC: More explanation on why no attention to extremes is given, since the word 'operational' is used, and in the introduction dune erosion, storm impacts, and coastal

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monitoring are mentioned.

AC: The paper focuses on validation of coupled wave-tide-surge modeling approach applied to regional scale model of the North Sea. To this end, we focus not only for storm impact application, but also on operational daily forecast application such as swimmer safety prediction and workable weather for marine and offshore industry, which are more relevant with normal daily conditions rather than extreme events. Therefore, we argue that year 2009 period, without specific extreme events, is a representative period to validate the CoSMoS for operational purpose. Additionally, storms were also recorded during this year 2009 period, with wave heights around 4 to 5 meters, and surge level of 2 meters, and for this period, model performs reasonably well. However, we aware that this storm is a typical yearly storm rather than an extreme event with return period of, say, more than 5 years. It is noted that some lines in the manuscript pointed out to the application of the system on dune erosion, coastal monitoring, and storm impact, which is not specifically covered by the current paper. Therefore, chapter Introduction will be modified accordingly, to make a clear emphasis of the objectives of the paper.

5.RC: At present it is not obvious how the model has been set up and more details about the wind and pressure data used to drive the model (including for example their temporal resolution).

AC: We have modified Section 2 accordingly where we present in more detail the temporal and spatial resolution of the hydro-meteorological model used in the model system.

References

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Best regards,

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