Natural Hazards
and Earth System
Sciences
Discussions

Interactive comment on "Ensemble Projection of the Sea Level Rise Impact on Storm Surge and Inundation in the Coastal Bangladesh" *by* Mansur Ali Jisan et al.

Anonymous Referee #1

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This paper presents the results of numerical experiments to investigate the impact of sea level rise induced by climate change on the extent and severity of the inundation caused by tropical cyclone (TC) storm surges in coastal Bangladesh. As the authors correctly point out, the approach used is a quite simple one and does not take into account relevant aspects such as possible future modifications in TC tracks and intensity and morphological changes. Nevertheless, the manuscript is an original contribution to the issue of climate change-induced hazards and the results of the study provide interesting suggestions for mitigation measures to be taken by policy makers and can encourage further research about this topic.

The manuscript is quite well organized and written, even though the presentation of the results is somewhat confusing in some parts and should be revised and made clearer. In my opinion, the paper can be accepted for publication after the following comments are addressed.

General comment: The description of results in Sections 3.2-3.4 can be sometimes confusing and has to be improved. The authors in some cases comment about absolute values of inundated areas extent in km2 or storm surge height, in other cases provide information about percent variations of simulated values with respect to present time and percentages related to the same quantities appear even inconsistent (see, e.g. lines 363 and 372). This is particularly the case of Section 3.4, where the discussion about Figure 7 is hard to follow. Lines 310-314 seem to repeat what stated in lines 295-301 but numbers are slightly different. The caption of Figure 7 itself is wrong, because each of the four plots shows the comparison of present time water level with both the considered future scenarios. Also, the higher percent variation in storm surge height at Charchanga station obtained for TC Aila with respect to Sidr is not intuitive and the authors should provide some interpretation attempt. In conclusion, my suggestion is to thoroughly revise this sections and to add one or more tables (e.g. one for inundation extent and another one for storm surge height) containing both the absolute values and the percent variations with respect to the present time scenario.

Specific comments:

Please check the correspondence between the references in the list and the citations in the text. For instance, the works by Mohal et al. (2006) and by Vatvani et al. (2002) seem to be missing in the text. Also, the reference to the Delft3D-FLOW manual is not coincident (Delft Hydraulics in the text vs. Hydraulics, D. in the reference list.

A general revision of the whole text is needed to eliminate several typing and punctuation errors, uppercase and lowercase letter usage, and missing or unnecessary blanks. For istance, see lines 73, 74, 136, 154, 181, 184, 190, 193, 240, 241, 279, 297, 351,

380.

Line 55: replace locale with locales.

Line 310-314 are redundant.

At the end of the Introduction, a brief paragraph illustrating the structure of the manuscript should be added.

In Equations (2) and (3), the term P0 is not defined.

Line 143: replace weas with was.

Lines 145-147: please provide some information about the native resolution of the topography and bathymetry data used.

Line 156: the reference should be to the work by Holland (1980), I suppose.

In Equation (6) the term e is not defined.

In Equation (8) the definition of MAE is not correct.

Line 218-219: the BIWTA acronym has been already introduced and can be used without the full explanation.

Line 376: replace "the probable range of inundated are" with "the most probable range of inundated area extent".

Line 480: replace representing with represent.

Lines 506-508: uppercase letter are unnecessary for measured and modeled water level.

Line 556: replace showing with is showing.

Table 2: 12 historical TC tracks are used in ensemble projection as mentioned in Sections 2.2 and 3.3.1. In my opinion, a further figure illustrating each track and/or just a table listing the main characteristics of each storm (e.g. name, intensity, day of landfall,

etc) would be useful.

Table 3: the third row with average values of statistical indicators can be eliminated, because averaging just two values is poorly significant.