The role of morphodynamics in predicting coastal flooding from storms on a dissipative microtidal beach with SLR conditions: Cartagena de Indias (Colombia).

The authors present a study on the role of morphodynamic changes in the flooding of dissipative beaches with microtidal regime, using Cartagena de Indias as study case. Although the importance of the role of the role of morphodynamic changes has been stressed by other authors, the presented work is novel regarding the direct quantification of changes in the prediction of flooding for the conditions of the study site and under different scenarios of SLR.

Overall, the paper is well structured, with results being presented in a clear and organized manner. Some general comments regarding the inclusion of limitations of the adopted approach in the discussion section, and specific comments to increase overall comprehension of the work are given as follows.

General comments

[G1] The main parameter presented as calibration variable is *facua,* which is accompanied in Table 4 by the Chezy coefficient. However, the Chezy coefficient is fix, directly related to the sediment grain size, and the reader must assume that the value is supported by previous calibrations for the site. Thus, it is recommended to include a comment on how the value of the Chezy parameter relates to the actual characteristics of the beach, and, as it is presented as a morphodynamic parameter, it is also recommended to include a comment on how results might be affected by changes in this parameter.

[G2] The discussion section should be further completed commenting on the limitations and/or assumptions of the adopted approach. One example is the limitation of Xbeach to properly calculate morphodynamic processes related to short (individual) waves. The model is presented in such a way that the reader understands that it is solving completely both components, while the model mainly uses the infragravity wave band to calculate morphodynamics, while it calculates morphodynamics related to the short waves by adding the contribution of the short waves to the infragravity waves. This means that, for instance, that the model has some limitations solving the diffraction processes taking place in study areas where processes are affected by the presence groins. Some notice about this is given in lines 342-346 and 348-356.Another example is that the study does not consider the beach long term response (given enough accommodation space) to SLR. The study compares scenarios based on the assumption of a given reference morphology.

Specific comments

(line 48) See G2. It is recommended to specify that the morphological processes and run-up are calculated with the infragravity wave band accounting indirectly for the contribution of the short waves band.

(line 86) It is recommended to add also the usual surge range or magnitude of extreme surge, to give and idea about its relative contribution to the total water level at the beach.

(Table 1) To make information in the caption self-contained it is recommended to add the meaning of cases in italics.

(Line 159 / Table 2) what is the offshore depth of the XBeach domain? Please consider adding this information in the manuscript.

(Table 2 and related text) Is the resolution the same in alongshore and crosshore directions? It is recommended to specify it in the manuscript.

(line 176) See line 48. See G2. It is recommended to specify that the morphological and run-up processes are calculated with the infragravity wave band accounting indirectly for the contribution of the short waves band.

(line 182) Consider defining non-linear shallow water equations: NLSWE.

(table 5 and related text) In cases with multiple cold fronts, it is not clear whether the time between them is simulated or not. Also motivate in the text the intention behind scenarios A4, B4, and C4.

(figure 7) Specify what (*) stands for in the figure caption.

(line 336-337) Add reference of other authors pointing in the same direction (importance of duration to the magnitude of erosion and inundation).