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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Role of intertidal wetlands for tidal and storm tide attenuation along a confined estuary: a model study" *by* S. Smolders et al.

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General comments

The paper is well written and structured. The overall quality of the manuscript is good and the obtained results represent a significant contribution to the understanding of natural hazards and their consequences. The scientific approach and the applied modelling methodology are valid and results are discussed in an appropriate way. The main limitation may be the schematic representation of the wetland in the model through basic topographic-geometric properties, not including frictional effects and topological

properties of marsh vegetation.

Specific comments

The model is essentially simulation the attenuation effect due to the change in the elevation of the marsh platform leading to changes in the storage capacity of the wetland. That means that in the end the model is simulating an area with bare soil (a kind of "deep mud flat") and not a real wetland consisting of a thick vegetation layer. Thus, not only friction effects of both bottom and vegetation are missing in the model but also the effect of vegetation of water volume that can be stored. The question is: does the authors think that results would be substantially different if these effects were included in the model ? How do you think these effects could be incorporated in the model in a simplified but realistic way ? Please, consider this issue in the discussion section. Regarding results of wetland surface area (3.3), it is stated that "the wetland surface area has a clear effect on tidal and storm surge attenuation along the estuary: the larger the wetland surface, the larger the attenuation of the tidal wave along the estuary..." (lines 291-292), whereas in the discussion it is stated that "...a further increase in wetland surface area will not result in an increase in water storage on the wetland due to the lack of time to fill this storage area" (lines 440-441). It is clear that the relationship between wetland surface and attenuation capacity is non-linear and it looks like there is a "saturation" effect or tipping points, with practical implications for restoration of wetlands. Please, explain and discuss this issue more in-depth and think about the possibility of making some calculations in order to detect possible tipping points in terms of wetland surface to be kept/restored in the estuary.

Technical corrections

In my opinion there are too many figures regarding the results of simulations (Figure 3 to Figure 12) and the reader gets somewhat lost. Please, try to reduce the number of figures or think about the possibility to include some of them as supporting information.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 3181, 2015.