

## ***Interactive comment on “Downscaling sea-level rise effects on tides and sediment dynamics in tidal bays” by Long Jiang et al.***

**Mick van der Wegen (Referee)**

m.vanderwegen@un-ihe.org

Received and published: 31 October 2019

Dear Authors;

Thank you for your interesting contribution to the discussions on SLR impact in estuaries. I think you did some decent work in downscaling tidal dynamics and analysing the -potential- impact of SLR on the tidal dynamics. Also you explored the potential impact on sediment transport and tidal flats survival. I think this latter aspect deserves some more clarification and discussion. In the attached document I have made some minor comments. Below I formulate my major concerns. I have no doubt accepting your work when these are adequately addressed.

1) You disregard morphodynamic development. This may be a justified assumption in

C1

the sense that the morphodynamics potentially create an extra and yet unclear dimension to the work. It is good to restrict your efforts sometimes. However, I feel that there will be significant morphodynamic analysis coming 100 years in the ES.

2) You consider coarse sediment only (neglecting a settling lag) whereas muddy sediment will be relevant as well. Mud could import while sand exports. Mud could heighten flats. A sand export could deepen channels while flats are maintained.

Drawing strong conclusions based on an analysis that disregards morphodynamics and fine sediments seems not justified. I suggest to rephrase the summary and conclusions acknowledging more clearly that morphodynamics and fines were not considered. You may add a discussion on why you disregarded these and what important implications of that assumption could mean to your results (like the heightening of tidal flats).

\* I believe it is also the reduced tidal range (and not only the reduced sediment supply) in the ES that makes the intertidal area to erode. Wave action is more concentrated at a specific height (in a smaller tidal range) causing more erosion of the tidal flats.

\* I am interested in how the ES is implemented in the MARs model: can you explain that a little bit more what the assumptions and implications are of the one way coupling? To what extent does the MARs model include the effect of the ES? Are the GETM boundaries far enough at sea to have no effect of the ES dynamics under SLR?

\* I miss conclusions since these are merged in the discussion. Please differentiate into "discussion" and "summary". And maybe add sub-headings in the section that is now called "discussion and summary"

with kind regards

Mick van der Wegen

Please also note the supplement to this comment:

C2

<https://www.ocean-sci-discuss.net/os-2019-50/os-2019-50-RC3-supplement.pdf>

Interactive comment on Ocean Sci. Discuss., <https://doi.org/10.5194/os-2019-50>, 2019.