

**Second review of**  
***Modelling extreme water levels using intertidal topography and bathymetry derived from multispectral satellite images***

All comments given in the previous review have been taken into account and they are reflected in this superior version of the work. I would like to highlight all the effort made in rewriting the paper and, in particular, the Introduction. The aims are clear and the reasoning is good. That said, I still have some concerns about the implementation and the analyses of the application. I think that the concept “one paper, one idea” should be taken into account here, because the main results might vanish among the other relevant results. However, authors have proved that they are more than capable of addressing my considerations.

**Major Comments**

1) I understand the aim of Figure 1 and appreciate the effort done, but quite confusing. Your description in the paragraph starting at line 104 is clear. I suggest, in any case, more work on the text.

2) In line 16 it's said that the system is assessed during a storm surge event, but only tidal levels are presented. In fact, the utilized model, which validation is presented in the Supporting Material, considers only the tide as external forcing. Why is it not forced with atmospheric fields? As you state in the Introduction, the storm surge peaks can reach values close to 30% of the tidal signal; hence, the incorporation of the atmospheric signal may be more than relevant. Indeed, I wonder if the incorporation could change the results presented in Section 3.4.

3) Based on the scale of the region, the tide presents a wavelength of about hundreds of kilometers and the Rossby radius of deformation of about tens of kilometers. Therefore, the tide has co-oscillating dynamics rather than wave propagation. Furthermore, due to the large scale of the process, it is natural that the tide doesn't “feel” the improvements achieved with the presented methodology. It's a restriction of the physics instead of the modeling. It would be interesting, in a future work, to perform a similar analysis with a relatively short wave such as wind waves.

4) In line 237 it says that astronomical tide analyses were undertaken, why do you apply the analysis? What information is utilized for this? Given the dimension of the region, I expected that it to be nested or, at least, forced with tidal global models.

5) Some sections in Methods deserve more work to highlight the main ideas. For instance, Section 2.3, 2.5.1, 2.5.2, 2.6 and even Fig. 6 present brief descriptions and rely mainly on the Supporting Material. I recommend summarizing the main concepts needed to discuss the results and adding these few sentences before discussing the corresponding results.

6) For a better reading and to stress the main results, I suggest authors to merge Discussion and Conclusions and summarize the content.

**Minor comments**

1) There are still inconsistencies in the unit system, for instance lines 14, 15 and 16.

2) In line 122 the term is “storm surge”, please correct that expression throughout the manuscript.

3) In line 330 please be careful with the use of the correlation in this context, is it correlation or the goodness of fit? In any case, are they tested?

- 4) For a better reading, before the analysis, first introduce the figure and its aim.
- 5) In section 3.4 homogenize the statistical evaluation, please use the same scores for a better interpretation.
- 6) In line 386, what is the third part?

**Typo**

l8 Should be “,e.g.”

l16 The sentence is too wordy, please rewrite to stress your idea.

L38 Should be “areas, respectively”.

L58 SBD is not defined yet.

L87 SBD and SDT were defined above.

L125 Remove “study site”

L130, L231 Error in latex citing reference.

L135 Was or is?

L184 The equations should be separated according to the reading flow.

L207 Should be “2d”

L209 SDT or waterline-SDT?

L247 Please avoid expressions such as the last sentence.

L287 The statistical scores acronymous are not defined yet.

L327 MRE is not defined.

L534 IWD is defined but then it’s not utilized.

L554 SLR stands for sea level rise?