

## ***Interactive comment on “Coastline evolution based on statistical analysis and modelling” by Elvira Armenio et al.***

**Elvira Armenio et al.**

elvira.armenio@poliba.it

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The manuscript describes an interannual analysis of the shoreline evolution in a dynamic coastal area in South Italy by means of field observations, statistical tools and 1D commercial model. The topic is certainly of interest for the readers of NHES; however, some flaws characterize the overall description of the adopted methodologies and results and my recommendation is to accept the manuscript for publication pending major revisions, mainly concerning some clarification on the adopted methodologies, as noted in the following comments. We would like to thank Referee#2 for her/his detailed revision work that will help us to improve our manuscript.

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- In Section 1, the Authors are suggested to review the new integrated approach proposed to assess coastal vulnerability to beach changes (among the others, Bonaldo et al. (2019) Integrating multidisciplinary instruments for assessing coastal vulnerability to erosion and sea level rise: lessons and challenges from the Adriatic Sea, Italy. Journal of Coastal Conservation, 23 (1), pp. 19-37).

Thanks for this suggestion. We read the paper, which is very interesting, and we have also cited it in this revised version.

- In Section 2, the Authors are suggested to add information on the morphological features of the area, such as the longshore transport in the area (main direction and rate), on the (if available) solid discharge from Ofanto river, closure depth.

The prevailing direction of the solid longitudinal transport along the Apulian coast is from north to south. At the moment, other information is not available.

- In Section 2, the Authors are suggested to review Figure 1. The study area extends from the harbor of Margherita di Savoia to Barletta, and not including Gulf of Manfredonia.

Thanks, done.

- In Section 3.1, the Authors are suggested to specify the sources of the analyzed aerial photography images and of the transects.

The aerial photographs were directly acquired by the Research Unit of our Dpt. during some surveys campaign. This information has been added in section 3.1.

- In Section 3.2, the y-labels in Figures 6, 8 and 10 should be correct into m and not m/year, if I well understood.

Thanks, there were some misprints in these Figures and have been corrected.

- In Section 3.3, in the linear regression model (Figure 13), the Authors are suggested to clarify the definition of x variable and its calculation (i.e., central position of each

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section starting from the northern one).

Thanks, we have modified the Figures 13a, 13b, and 13c and we have clarified the definition of x variable and its calculation.

- In Section 3.3, the Authors are suggested to clarify the input conditions for waves, wind, water levels.

The input conditions for the LITPACK were already described in 3.3, but some other notes have been added in this revised version.

- In Figure 13, the caption text misses some years reported in the graph and in the legend.

Thanks, done.

- The presentation and quality of Figure 14 are suggested to be improved.

Thanks, done.

- The new grouping of the transects as shown in Tables on page 20 is a little bit confusing in reference to the results previously described. The Authors are suggested to improve the presentation of this analysis.

The grouping of the numerous transects into profiles was necessary to compute the Pearson coefficients and allow readable Tables. The way in which this grouping was carried out was already described in the paper.

- In Section 5, the Authors are suggested to discuss the feasibility to run simulations for longer periods (i.e., 2005 - 2013 or shorter period 2005-2011 and 2008-2013) and eventually compare the computational results with observations.

Actually, the simulation was carried out in the described way, in order to validate the model in similar temporal periods. Once validated, we had used the validated coastline as the new input data for the successive run. In this way, there was a multiple check

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on the model performance.

- A review of the English language is also suggested.

Thanks, we have revised the English language.

Please find attached as supplement the revised paper.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-239/nhess-2018-239-AC3-supplement.pdf>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-239>, 2018.

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