Nat. Hazards Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/nhess-2018-173-RC2, 2018


Natural Hazards and Earth System Sciences
Discussions

# *Interactive comment on* "Numerical and remote techniques for operational beach management under storm group forcing" *by* Verónica Morales-Márquez et al.

**Anonymous Referee #2**

Received and published: 17 August 2018

GENERAL COMMENTS The paper presents interesting scientific and technical aspects and an innovative approach in the study of an urban beach, located in NE coast of Mallorca Island, Mediterranean Sea. The paper describes the storms' impact on a biogenic carbonate sandy beach. The study is based on the analysis of proïňĄles extracted from coastal video-monitoring techniques, RTK and echo-sounding surveys, current hydrodynamic measurements and the use of numerical models in order to ïňĄll gaps in the dataset. The main contribution of the study is to bring forward interesting data for a microtidal coast under low energetic conditions affected by storm events. In such way, the title should be more explicit, taking into account the oceanographic context. The introduction explores comprehensively the available literature although



the objectives in mind are not very clear. Likewise the authors stated that this methodology could be helpful for beach managers, but only a short paragraph is present in the discussion section. Moreover some additional aspects should be addressed in the review process: (1) it is crucial to define the concept of shoreline used in this work; (2) the differences between storms and storm groups should be pointed out clearly; (3) it is necessary to review the text and define morphodynamic zones and its limits, commonly used in this kind of studies (for example: what is a dry beach? The area always situated above the mean sea level, the zone limited by the mean high tide level or the area exposed in low tide conditions. . .); and (4) some discussion relating the results and its future use to coastal management might be useful. The Data and Methods section should be further developed. It is not specified the way the authors used for comparing field data with Xbeach simulation. For example, concerning the wave parameters, what are the values used in Xbeach model? Another issue is related with the beach profile: it is not clear what are the proïňĄles acquired in field campaigns and what are the proïňĄles provided by the model. It is not explained the process adopted to obtain the DTM from the topographic and bathymetric proïňĄles. Would also be relevant to provide an error estimation on the estimation of sediment balances. The Results and Discussion section needs to be reviewed and improved.

I recommend the publication of the paper after revision addressing the comments above and the aspects summarized below.

SPECIFIC ASPECTS - All figures in the paper are referred as Fig. A.1, Fig. A.2. . ..and so one; What is the reason? It must be a mistake. . ., nominally in the subtitles they are referred to as Fig. 1, Fig. 2 . . ... - Identify for each situation A, B and C as referred to in the Fig. 2 subtitle - Fig.3: The workflow shows a spelling error; please note "Beach DM elaboration". In the subtitle a) and b) should be in caps

2 Field description - Regarding the content of this section, I have some doubts about the title; it seems to be more a presentation and description of the Study Area - Page 3, line 15: What kind of sand bars are present? Are they longitudinal or transversal

bars or another type? - Page 3, line 20 and following: May the authors indicate also the period (T) for each situation described?

3 Data and methods - Page 4, lines 5 to 13: The text is not clear: the data presented are obtained from this study or are taken from others authors? - Page 4, line 20: Do you have also topographic surveys on the aerial beach zone? (in line 26, you referred DGPS-RTK surveys; in fact, this is only a methodology to obtain topographic data) - Page 5, line 18: Specify “a submetrical resolution” - Page 5, line 19: It is not clear, again, what is considered aerial and submerged beach; what does it mean “up to 1 m depth”? It is in low or high tide conditions? - Page 5, line 31: Why were the samples trapped for 24 hours? - Page 5, lines 31 and 32: “Sediment were analysed . . .. . ... and grain size obtained . . ... using Gradistat software (Blott and Pye, 2001). The use of this software only allows to obtain statistical parameters. - Page 7, line 14: Are the sample statistics calculated (ex. D50) consistent with previous works (i.e. Gómez-Pujol et al., 2011)? - Are the sediment samples homogeneous along the cross-shore proïňĄle#07? Were the porosity and the density of the sediments obtain by the authors? Why do authors say “porosity is about 30% and the density considered as 2650kg/m3 “?

4 Results and Discussion - Page 7, lines 23 and 24: Specify what is an “emerged beach”. - Page 7, line 25: Please clarify “. . .attend ca. 1m. . ..) - What is the maximum extension of beach profiles? Are the profile lengths (from model, video images and field campaigns) the same to all scenarios? - Page 7, lines 27 to 32: It would be interesting to discuss the beach zone were the differences are more important and to present a comparative example between the two methodologies. Can the authors specify if the differences are larger in the foreshore or in the shoreface? - Page 8, lines 10 to 15: Is the bar described a shoreface or is it a lower foreshore bar? It looks like a ridge-channel system well developed between 400 and 900m along coast! - How was the mean slope calculated? What are the limits considered to obtain this value? - Does the grey colour difference (timex images from fig. 7) indicate the tide level at each moment? - Page 8, line 15: Dry beach, again! - Please, point out in the figures



8 and 10 subtitles what does it mean the black line. Is this the shoreline? How is it defined? - Page 9, line 1: Check “. . ..Mediterran ean by. . ...” - Page 9, lines 10 and 11: Have you some information about the influence of local longshore currents? It would be interesting to try seeing the influence of these currents on the distribution of sediments along the coastal stretch. It is obvious that in addition to the main transversal beach behaviour, there is also longitudinal transport. - Page 9, line 14 and following: After the foreshore sand recovery, there are a significant difference between volumes. Have the authors any idea about the sediment circulation? Do the sediments go out from this littoral cell?

References Please note the followings aspects: Page 11, line 19: the year of publication should be placed at the end of the reference Page 11, line 29: “and” is missing Page 12, line 10: remove “et al” Page 12, line 13: the year of publication should not be in italic Page 12, line 19: remove “pages” Page 13, line 11: remove “et al""

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