Natural Hazards
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Sciences

Discussions

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

Anonymous Referee #3

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Review of Morales-Márquez et al., 20

The paper presents the effects of a storm group formed by 3 storms on the morphology of Cala Millor, a beach in Majorca, Balearic Islands.

The paper includes a review of the state of the art and previous references in the area, a field description of the study area, an analysis of the used and developed data (numerical modeling, video-monitoring and field campaign). As a result, interesting conclusions for the specific study are drawn, focused on presenting approaches to improve beaches management.

GENERAL COMMENT:

The paper is well-structured and its length is adequate. The topic is very interesting and suitable for the journal. I have, however, a few major concerns: some details are missed and a deeper explanation of some approaches are needed.

MAJOR COMMENTS

The analysis of the specific case of Cala Mijor is properly approached, reaching interesting results. It is a nice example of an application of several existing techniques. The scientifical novelty is not evident, and although it can be inferred, it definitely needs to be highlighted, because it is really worth it.

The methodologies and instrumentation are well explained but they need more details and I mainly have doubts regarding the use of Xbeach. The application of the numerical model to assess the morphological changes after each storm needs more details in order to understand better the limitations of the results (grid size, bottom friction, etc.), as detailed in the following specific comments.

SPECIFIC COMMENTS

1. Introduction: The goal of the paper can be elaborated, and some specific lines explaining the novelty of the work are needed.

2. Field description.

-In order to understand better the variability of D50, please, if available, include some details regarding the spatial variability along the beach.

-Include the reference of the tidal amplitude

-Please, explain Fig. 2a: Vertical reference and what is being shown. In the marked storm, looks like if there is a global recovery of the beach. Why?

-In the same figure: Where is the origin? Is it the PROF#01? Then, why is it noted an advance of the beach in the South part, during the E or ESE storm?. Figure (A2, a) is called (2 A) in the Figure caption.

3. Data and methods.

-Is there a website or link to RiskBeach experiments where more details can be referred? Are these data available?

-Figure 3 demands a more detailed explanation due to its complexity. This chapter is a crucial part of the paper that needs some changes.

-Wave conditions: Please, consider to include a brief explanation regarding why you consider that 3 hours is enough for this kind of study.

-Fig4a. Put S1 over the corresponding blue shading part.

-Pg5 line4. It says that offshore wave conditions (in 50m) show 3 storms and refers to Figure 4., but Figure 4 shows the graphs of intermediate waters (25m), as explained in previous lines and in the figure caption.

-Please, elaborate on how to interpret figure 5.

-Numerical simulations:

...–The resolution of the grids for the Xbeach simulations is 15*7 m. Is that enough to include the influence of rock and Posidonia areas?

...–In addition, the authors highlight the importance of the Posidonia, as it increases bottom roughness and attenuates the waves. Did xbeach modeling take this aspect into account? How?

...–If incoming wave direction is perpendicular to the coast, the induced sediment transport should not be important. Did this occur in the simulations?

...–Were sediment characteristics interpolated for the whole grid from the samples obtained in just one profile?

...–Why was the dimensionless porosity of the sediment set to 30%? Do the authors consider it as a common value or could provide a reference?

...–Please, explain the limitations of the application of the model and interpret its accuracy when comparing to other data.

4. Results and discussion

-PG7 line 21: The given values are absolute? Positive or negative? I suggest to include variation ranges.

-PG7 line 24: How did you obtain the depth of closure?

-In table 2 variation ranges of the profile would help to understand the profiles

-PG8 Line2-3: In some big areas a difference of 20cm can infer a large volume of sand. Please discuss why you consider the agreement between data as good.

-PG 8 Line 10. Please refer the statement "Although the individual storms were not exceptional in terms of intensity". Maybe to a previous figure or a previous work.

-PG8 lines 10-21. Did the sediment move just in the same profile? I miss the explanation of the functioning model that helps to explain where the sediment went.

-PG9 Line 4-5-6: Are you planning to integrate into your methodology the recovery time to apply it in the beach management? How would you do it?

5. Conclusions: PG10 Line 6-8: Could you add a brief explanation of how this integration should be done? Or maybe an example of application.

TECHNICAL CORRECTIONS -Some figures are named as A1, A2, etc, and then in the figures caption the "A" is not included. Please be consistent.

-Some acronyms are not defined the first time they are used: RTK, AWAC

-Verb tense. Sometimes past is used ("data was obtained", PG5 line19-20), others present ("Offshore wave conditions are obtained", PG4 line31-32) or future ("we will apply the model to analyze the storm group period", PG7 line5). Please be consistent.

-PG2 line 10: at the end of the sentence the verb is missing.

-PG9 line 1: Mediterran-ean

-References:

...–the reference of Anderson et al 2010 is not in the text

...–In the reference of Bosello et al (2012) the year of the publication is not at the end, as in the rest of the references

...–In the reference of Jara et al. (2015) the year is in Italic.