Ocean Science
Discussions

OSD

Interactive
comment

Interactive comment on "Uncertainties in shoreline position analysis: the role of run-up and tide in a gentle slope beach" *by* Giorgio Manno et al.

Giorgio Manno et al.

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We wish to thank reviewer#2 for the comments that helped us to improve the manuscript

COMMENTS AND RESPONSES

Question/ Adjustments *Specific comments Pag. 4, I noticed this affirmation: Note that the offshore wave parameters were the only source in the propagation model SWAN, and wind, bottom friction, and white-capping were not considered which are the implications of this? Could you briefly comment it?*

Response: The original manuscript was modified following the reviewer suggestions. The relatively small area of numerical SWAN domain means that wave growth is minimal and thus to simplify the analysis the wind source term is not included in the our analyses. The white-capping was not included in the calculation because generally, it is not recommended to include this source term when there is no wind input. The bottom friction may play an important role in shallow water studies but it is a topic outside the subject of the present work, which is focused mainly on modelling offshore and/or intermediate wave conditions.

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Question / Adjustments
Could you please give further information about the Boussinesq model you used? What about the approximation order? Last, I would mind to ask further information about the Lagrangian model used for the shoreline boundary conditions.

Response: The reviewer is referred to the work of Musumeci et al.(2005) for the analytical details of the derivation of the governing equation of the Boussinesq model. In particular the governing Boussinesq equations has no assumptions about the order of magnitude of the nonlinear parameter $\delta = a_0/h_0$, and the resulting model is fully nonlinear to terms of O(μ^2). Where a_0 is the offshore wave amplitude, h_0 is the offshore water depth, $\mu = k_0 \cdot h_0$ is the dispersive parameter and k_0 is the wave number offshore. Dealing with the shoreline motion is a critical issue in numerical models because is necessary to discriminate between the wet region of the computational domain, where calculations of the governing equations are required, and dry region, where no wave motion is defined. In the present paper we used an approach which describes the physics of the swash zone hydrodynamics, by solving the equations of the shoreline motion. Consequently we used specific physically-based equations to calculate the velocity of the shoreline and the shoreline position, which can be solved once the velocities in the remaining (wet) domain are known. Fundamentally, we followed a Lagrangian approach similar to the one presented by Prasad and Svendsen (2003). The shoreline equations are now added in the reviewed paper.

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Question / Adjustments
Pag. 4, lines 26-27, Not clear, please - if possible - give values such as Median, D_{50} and sorting. ...I guess they are important parameters determining infiltration.

Response: The D_{50} was added in the amended paper and consequently redundant parameters were removed from paper. The sentence (lines 26-27) was simplified and clarified.
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Question / Adjustments
13, line 11...which is the importance/implications of the presence of beach cusps? Pag. 13, lines 12-13...which are implications? Even this is NOT strictly related to the topic presented in your paper, I would mind you briefly comment on this topic and implications to your study: I guess cusps' presence can give rise to erroneous results, please consider the paper: Giorgio Anfuso Dan Bowman Chiara Danese Enzo Pranzini (2016) Transect based analysis versus area based analysis to quantify shoreline displacement: spatial resolution issues. Environ Monit Assess, 188:568?

Response: The beach studied has not a rhythmic morphology. We agree with the reviewer#2 that in the case of large presents of beach cusps they can influence the attended results. Therefore the paper was modified taking into account the remarks made by the reviwer#2.
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Question / Adjustments
Pag. 15, line 14, change retreatment or advancement for erosion and accretion. And change this and a retreatment rate close to the total uncertainty would not be constructive for: ...a retreat rate close to the total uncertainty would not be acceptable.

Response: The sentence was modified in the amended paper as suggested by reviewer#2.
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Question / Adjustments

T*echnical corrections The quality of English is generally quite good but I have to pro-pose small corrections. Pag. 2, line 1, maybe is "must" and not "much". Pag. 2, lines 14 and 15, I suggest ..."used DSAS to evaluate both positioning errors..." Pag. 2, line 17, Hunt is not in parenthesis, I guess. Pag. 2, line 20, I suggest:..."water prop-agation model. Tide effects..." Pag. 3, line 15, I suggest:..." four errors are related to " Pag. 4, line 29, I suggest..."especially houses emplaced too close to..." Pag. 4, line 30, I C2 OSD Interactive comment Printer-friendly version Discussion paper sug-gest:..."destruction of dunes and their associated natural supply..." Pag. 5, Figure 1: I suggest:..."Mazzara del Vallo buoy, related to..." Pag. 5, line 6, I suggest, but not sure..."details of expected results"... Pag. 5, line 7, I suggest to say:"...by Holman and Sallenger (1985), and this is the case of this paper. Based on a high..." Pag. 6, line 16, ..."from the buoy.. ." Pag. 7, line 6, ...to the field measurements and, for this reason, ..." Pag. 7, line 10, I suggest: Five orthorectified aerial images were used to assess time variations of the shoreline position during the 1994–2007 time span (Table 2).*

Response: All the suggested correction were made in the reviewer paper.

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Question/ Adjustments *Pag. 7, line 10, say: ..ground control points... Pag. 7, lines 14-15, this is not clear: For each of the five aerial surveys, an offshore wave condition was obtained by processing the measurements of the Mazara del Vallo buoy (Fig. 4) taken during the time period of the survey (Table 4). I suggest: In order to reconstruct waves conditions at the day the aerial photos were made, data recorded from the Mazzara del Vallo buoy were analysed. Pag. 10, is table 5? Pag. 11, Fig. 4, the letter "b" is missing. Pag. 15, line 13, ...I suggest..."line estimation"...and:..."in situ run-up..."*

Response: This correction was made as suggested by the reviewer#2.

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