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Earth System Science Data Discussions

Interactive comment on "Global distribution of nearshore slopes with implications for coastal retreat" *by* Panagiotis Athanasiou et al.

Anonymous Referee #2

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Is the article appropriate to support the publication of a data set? Yes, indeed. It describes the dataset, how data were compiled and/or produced and it also provides some examples of application.

Is the data set significant – unique, useful, and complete? The described and online provided dataset is significant, useful, worldwide distributed and it will help to fill a frequent commonly found gap in coastal data.

Is the data set itself of high quality? Due to its worldwide distribution, the data set can be considered of good quality. They have been validated against local data and bias and error measurements are provided. Is the data set publication, as submitted, of high quality? The data set publication is adequate to the importance and quality of the data provided. The length to describe the data is appropriated, and the publication itself has

the right structure and cover the required aspects to be useful for readers and potential users of the data.

In what follows some specific comments are given.

[1] Pag 2, line 8. The used definition of the depth-of-closure is not the standard one. The depth-of-closure defined by equation 1 is NOT the offshore limit where sediment transport is zero. The standard definition is "the depth seaward of which there is no significant change in bottom elevation".

[2] Pag 2, line 22. As it is written this sentence seems to indicate that in the presented study the depth of closure is going to be calculated in a different way of those mentioned in the previous sentence (empirical formulas using wave parameters).

[3] Page 5, line 1. According to the authors, dc is calculated using the standard definition of wave height associated with a probability of occurrence of 12 hours/year but applied to a long (34 years) time series. Although used time series is long enough to be representative, it is not infrequent (Udo & Takeda reference provided by authors is an example) to assume that when dc is going to be used in long-term processes characterization, this average wave climate can be substituted by other characteristic of extreme conditions (e.g. by using a wave height associated with a given return period). Which should be the expected impact of this approach in the dataset?

[4] Page 5, line 2. dc is calculated using the Vousdoukas et al (2018b) wave data. However, there is no information on how good is the data set. In fact, in the original reference there is not too much mention to the calibration of hindcast against measured wave data. Since this parameter is used to define the profile length to compute the nearshore slope, which is the potential impact of the accuracy (or lack of) on the obtained values.

[5] Page 5, lines 5-6. Authors select dc in an opposite manner as it has been traditionally defined, i.e. it is usually calculated as the most landward position whereas authors'

method results in the most seaward location.

[6] Page 6, line 23. This is not a validation of dc computations. Authors are comparing their estimation with another estimation. Since in both cases they are using the same equation (no dc data are available in the comparison), they are essentially comparing used wave data, i.e. they are checking whether Vousdoukas and WIS wave data are comparable (at statistical terms). Due to this, sentence in line 28 is not fully true. Differences can simply be explained by the difference in wave statistics at a given location among both wave data sources.

[7] Due to the above-mentioned questions regarding dc and its implications for calculating nearshore slope, it would be interesting which is the impact of changing dc in different % (shallower and deeper) in the estimated nearshore slope. This will help to assess the robustness of estimated values as well as the real impact of the selection of the dc-value on the data set due to the base data (shallow water bathymetry) accuracy and resolution.

[8] Page 8, lines 20-23. The generally steeper slope along the West Americas coast is explained by using the role of swell as well as tectonics. Which should be the most dominant factor when dealing with the inner shelf slope? Is also sediment size any factor to be considered?

[9] Section 5.2 apparently deals with possible improvements in estimation in SLR-induced retreat. However, it is only a comparison between estimations using the provided dataset against the use of a common and single value worldwide (1/100). In this sense, it is just an improvement when comparing in those conditions. However, if these estimations are compared with many of the existing ones using local data, the improvement is not so evident.

[10] Limitations is an important aspect to be considered. In this case, validation of the dataset needs to be improved by increasing local datasets to compare along world coastlines under different conditions and characteristics.

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