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

Anonymous Referee #1

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The manuscript by Athanasiou et al. introduces a new global dataset of nearshore slopes with the aim to address an important gap of global-scale coastal analyses. The manuscript is very well structured and the methods are presented in a comprehensive and understandable manner. From a methodological point of view, the work that the authors have carried out is very meticulous. Data processing has been conducted with high attention to detail and limitations of the work are explicitly acknowledged. Importantly, based on the description that is provided, the results are reproducible and the methods can be employed by other researchers when improved data become available. I recommend that the manuscript is published. I have included below a small number of comments that the authors should address in order to clarify some methodological decisions and accordingly discuss/revise some small parts of the manuscript.

I hope that the authors find the comments useful for improving the manuscript.

- pg. 1 line28: the coast also comprises different land use/cover types, which also define its response to these events

- pg. 3 line 23: Based on my experience, the choice of the coastline is crucial for the analysis. According to the smoothing method described, a different coastline dataset (which could diverge considerably from the selected one) would influence the results (see also discussion by Lichter et al., 2010, in the context of exposure analysis). I believe that this is a point that the authors need to discuss (briefly) in the manuscript (there is mention of this in the limitations section, but not really addressing the point)

- pg. 4 lines 1-4: To my understanding, the smoothing process can considerably affect the calculation of the slope and generally produce much lower values. I am surprised that the authors do not discuss this point in the limitations. Also, doesn't this process essentially "remove" all cliffs? Finally, isn't this the reason why the calculated global slopes are milder than those observed? (see lines 5-8, pg. 8).

- pg. 4 line 14: I am a little confused with the interval (25m) chosen for the equidistant points along the transects, considering the horizontal resolution of the employed datasets. Please justify.

- pg. 4 line16: what do "significant human interventions" include?

- pg. 5 line 18: how many of those not calculated were sandy beaches?

- pg. 8 line 20: is it the wave climate affecting slope or vice versa? Also, swell waves often occur in coasts with mild slopes. I believe that the explanation here is rather weak.

- A general point: to my experience, the calculation of slope in a global application can be affected by the type of projection. Also, re-projecting datasets to different projections can be a complex (or even problematic) task in the context of global applications. I think that the authors would need to provide some additional information (also in the

supplementary material if they prefer) regarding those choices and state what type of projections they employed and how slope/length were calculated for the entire world.

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