

Earth Surf. Dynam. Discuss., referee comment RC2
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Comment on esurf-2021-29

Juan Felipe Paniagua-Arroyave (Referee)

Referee comment on "The effects of storms and a transient sandy veneer on the interannual planform evolution of a low-relief coastal cliff and shore platform at Sargent Beach, Texas, USA" by Rose V. Palermo et al., Earth Surf. Dynam. Discuss., <https://doi.org/10.5194/esurf-2021-29-RC2>, 2021

General Comments

I had the opportunity of reviewing the preprint (esurf-2021-29) entitled "The effects of storms and a transient sandy veneer on the interannual planform evolution of a low-relief coastal cliff and wave-cut platform at Sargent Beach, Texas, USA" by **Dr. R. Palermo et al.**, under consideration for publication in the journal Earth Surface Dynamics of Copernicus-EGU. The preprint investigates soft cliff and platform retreat at Sargent Beach (Texas, USA) to understand erosion mechanisms that drive the high retreat at this location. The authors quantify cliff retreat between 2009 and 2017 from 7 aerial photographs using the transects separated alongshore by 1 m. The authors complemented these calculations with a terrain change quantification from lidar-derived digital elevation models of 2016 and 2017. Also, they quantified sediment cover and local cliff erosion (from erosion pins) every 6-8 weeks during 2015. Based on these remote sensing data and field campaigns, the authors quantify soft-cliff retreat rates, shoreline sinuosity, and shoreline roughness, which they use to drive conclusions and propose a conceptual model of retreat.

The authors focus on: (1) showing that storm events increase shoreline roughness and sinuosity, which in turn drive annual high erosion rates; (2) evaluating the relationship between sediment cover and cliff retreat; and (3) evaluating the temporal and spatial relationship between shoreline roughness and sinuosity with storms and sediment cover. These objectives are interesting from basic and applied standpoints. For example, the authors highlight that understanding cliff retreat at Sargent Beach matters to the local community because it constitutes the barrier that separates the Gulf Intracoastal Waterway from the Gulf of Mexico.

I commend the authors for collecting remote sensing and in situ data to assess shoreline retreat, including relatively novel ways of quantifying cliff erosion (roughness, sinuosity), and providing an insightful discussion on soft cliff retreat. I find the article well written, with sound science and precisely and delicately edited figures. I, therefore, find this article publishable after minor revisions.

I might provide a couple of suggestions worthy of attention from the authors from the

stylistic perspective, which I include under "Technical corrections." However, I'd like to highlight a potentially incorrect concept that the authors use profusely in the text: wave-cut platform. As the authors recognize in Line 102 (beginning of section 2.3), subaerial processes may be as crucial as marine (waves) action in driving soft cliff retreat. I suggest replacing the term "wave-cut platform" with "shore platform," which encompasses subaqueous and subaerial drivers. This change shouldn't affect the authors' findings and discussion.

Specific comments

Title: I suggest replacing "wave-cut platform" with "shore platform" here and throughout the text.

Abstract: I suggest including a statement on how did you perform your study (methodology).

Line 165: I suggest including how did you calculate the uncertainty (e.g., Genz et al., 2007)

Line 167: Regarding the linear regression, I cannot find Figs. S3-S4. Could you please make sure they are available? Also, why using the linear regression and not using, e.g., the angle related to the principal components or a low pass filter?

Line 170: I suggest showing the equations you used to quantify the sinuosity and roughness.

Line 210: I suggest showing the exponential model in Fig. 6a.

Line 213: I suggest including the value you obtain for t_r .

Line 241: this difference is interesting. Any idea why it occurred?

Line 244: I suggest changing "coastal" with "cliff" to avoid potential ambiguities related to the statement of sediment being exogenic. This statement could be interpreted as "sediment being exogenic from the littoral cell".

Line 252: there is a potential feedback occurring (not yet studied) when muddy cliffs erode and the sediment settles during calm wave periods. This settled mud could dampen wave energy, particularly at long (infragravity) periods (Elgar and Raubenheimer, 2008).

Technical corrections

- Line 32: I suggest using "cohesive cliffs" instead of "clay cliffs".
- Line 121: please fix the name "Sunamera" in the references.
- Line 129: maybe a "to" is missing after "linked"?
- Line 136: I suggest checking the writing style of the phrase "Rocky sea cliffs..."
- Line 137: there is a pen-slip in "replated", maybe you mean "related"?
- Line 188: please add a space between "1" and "m".
- Line 191: I cannot find Fig. S1. Please make sure to include it.
- Line 305: I suggest including a short account of your study in the beginning of the conclusions.

- Line 319: I suggest checking References format.
- Figure 6: I recommend indicating when Ida and Havey occurred. Also, please separate the units and variables in labels.
- Figure 7: it seems you don't mention this figure in the correct order...
- Line 469: you mean black and brown lines?
- Line 475: you mean Fig. 9.

References suggested

Elgar, S. and Raubenheimer, B., 2008. Wave dissipation by muddy seafloors. *Geophysical Research Letters*, 35(7).

Genz, A.S., Fletcher, C.H., Dunn, R.A., Frazer, L.N. and Rooney, J.J., 2007. The predictive accuracy of shoreline change rate methods and alongshore beach variation on Maui, Hawaii. *Journal of Coastal Research*, 23(1 (231)), pp.87-105.