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Comment on esurf-2021-29

Anonymous Referee #1

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-RC1>, 2021

Manuscript: The effects of storms and a transient sandy veneer on the interannual planform evolution a low-relief coastal cliff and wavecut platform at Sargent Beach, Texas, USA

General Comments:

This manuscript looks at the occurrence and mechanisms of coastal cliff erosion, using Sargent Beach as a case study. The study is interesting and reveals some good relationships between rates of erosion, storm events, sediment cover, roughness, and sinuosity. My main comments on this manuscript can be addressed by some restructuring and expanding the results. In terms of restructuring, the introduction is lacks theory but some of the background information I was looking for then appeared in the study site section. There is also some study site information that was in the introduction. There is a good dataset behind the results, but I don't feel the authors go into enough detail and then it feels there are big leaps to some of the discussion points and conclusions. I've made some more specific comments below and some minor suggestions/corrections. I hope my comments helps to focus the first half of the paper and draw out some more of the interesting results in the second half.

Specific Comments:

- **Intro**

- I was looking for a bit more in the intro/lit review before the study site, e.g. move

L120-126, 135-142 into the intro – but these need revising so I know why you're telling me all of this. It reads a bit like a list of 'facts' rather than it setting the stage for your research.

- L50 "Although shoreline change at Sargent has been historically analyzed using measurements spaced 50 meters or more apart 50" – can we have some more info on this?

- L54: "Our measurements show", are you talking about results from this study? Shouldn't be in the intro. I'd like more literature/background on this in the intro though.

▪ **Methods**

- Did you do any estimation of error with your method of detecting the shoreline. It would be good for this to be acknowledge. Was it always really clear where the shoreline/base of the cliff was?

- Figure 4 could do with being zoomed out – or having a zoomed out map as well so we can get the context. It's hard to see what exactly we're looking at because of how cropped it is.

▪ **Results**

- Can you add some values to section 4.1.

- L212 : "Using the fitted empirical model, we calculate a recovery timescale" – please add the results of this calculation – later I read that it's 5 years?

- L216: What is the consequence of the erosion pins falling out and only being able to plot the smallest possible retreat? If May-July was actually much larger, this might change the theory that there is little to no retreat for sediment cover >90%

▪ **Discussion**

- You make some quite big statements without, I think, the data to support – or at least we need a little more explanations/acknowledgement of the limitations.

- L246: “Here we show that cliff retreat occurs when sediment cover is <90%” – cliff retreat still occurs above 90%, it’s just slower. I don’t feel you have enough datapoints to identify 90% as a threshold.

- L246: “Additionally, our observations of cliff morphology can be linked to erosion by sediment abrasion” – there needs to be more in section 4.1, we don’t really see much of the results relating to morphology of the cliff face. I’m not sure where in the results this statement stems from?

- L247: “If sediment cover is 90% or greater, no cliff erosion occurs and there is no change in morphology” I don’t agree the results show this – erosion still occurs >90% even if small and I can’t see clearly in the results how this links to morphology? It could become more evident if there was more in results section 4.1.

- L249: “erosion is focused on the sides and back of the embayments, increasing the sinuosity and roughness of the cliff face” – not sure where this is shown in the results?

- L268: “Storm occurrence is clearly not sufficient to infer net erosional processes,” – storms can have a significant impact!

- L284: “at Sargent Beach is the recovery timescale, ~5 years after a storm or shoreline roughening event” – this wasn’t shown in the results (see earlier comment).

Minor comments/Technical Corrections:

L42: please can you define Type-A

L44: “the largest concentrated extreme of shoreline erosion globally”, this sentence doesn’t really make sense without reading it a couple of times, although I get the gist. Consider revising this phrasing.

L48: "Similar cohesive coastal cliffs exist globally... London, UK (Hutchinson, 1973)." This is broad and I'm not aware of cliffs in London itself? I could be wrong...

L59: "and other larger coastal cliff systems" – you only talk about Sargent, so this isn't true. You can only infer?

L63: "foreseeable timescale" – do you mean that it is likely to breach more regularly, or that it is likely to breach in the foreseeable future?

L66: "150 m strip of barrier coast that separates the GIWW" ...from the Gulf of Mexico.

L129: "allows sediment particles **to** act as tools of abrasion" - add 'to'

L261: "Sediment cover is often highest on the cliff face at Sargent Beach in the embayments and decreases to little or none in front of the headlands." – Can this be revised to be a little clearer – e.g. Sediment cover is often highest in the embayments at Sargent Beach, and lowest at the headlands.

L278: "smooth the roughened **the** sea cliff and with initially high erosion rate" - remove 'the'

- Gulf Intracoastal Waterway – sometimes you abbreviate this and others you don't.

- Be careful of the length of your sentence – many are 3+ lines long which makes them harder to read and digest.

- Figure 9c: the colours confused me initially as I was expecting red to be negative change. Consider changing this.

- Abbreviation of TX throughout either needs to be defined or just stated a Texas, for those not in the states.

- Sometimes you use 'five-year' and other time '5-year' – make this consistent.

- Figure 7 in the manuscript text comes before figure 8?