Review of: "Evaluating Hydrologic, Geomorphic, and Vegetation Parameters to Assess Natural, Living, and Hardened Shorelines along the Northern Gulf of Mexico"

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This study evaluates the resilience of three different types of shoreline (natural, managed, and armored) in the context of high and low-energy wave energies using a suite of diagnostic measurements. The study's use of hydrologic, geomorphic, and vegetative parameters is a novel approach that identifies unique relationships between shoreline and ecosystem response. The authors use previously developed statistical models to visualize data interactions and relationships. The paper is well written and the layout is appropriate for the content. Some edits listed below would assist in improving the readability of the manuscript. In general, some clarification is needed for specific content, and some additional information on study sites is needed. Other than minor edits the paper is suitable and ready for publication.

The location of text to which the comments below address can be identified by the heading (in italics) that precedes the comment. Sentences that the comments refer to are in quotations.

Abstract:

Clarify what energy type: "and hardened shoreline across two different (wave) energy groups"

Introduction

Hardened Shorelines

Ref needed: "Hardened shorelines interrupt natural water flows and coastal morphodynamic processes, as well as sediment transportation by longshore currents."

Would move next refs (Bozek & Burdick, 2005; Ruggiero, 2009; Gittman et al., 2015) to end of sentence.

Living Shorelines

Clarify sentence layout, "it" may be referring to sedimentation: "Sedimentation increases in the presence of vegetation because it creates drag in the water flow".

Methods

Study Sites

Throughout this section 'sampling' is mentioned. The term is ambiguous at this point since the reader does not know what sampling refers to. This section establishes geography of study sites, perhaps rephrase with "Sites were visited in the summer and winter of 2020".

Perhaps a paragraph outlining the environment of each study site. Were they within natural bayous, open embayments? Large fetch? Sandy environment (e.g. beach extent) or marshy? Structures (docks, roads, ramps) nearby? Hard to tell from the aerial photos in figure 2.

Figure 3. Spell out HS, LS, and NS, either in figure or figure caption

Geomorphic Features section

Reference for "dominant seasonal wind direction, which comes primarily from the SE direction."

Sediment Bulk Density and Organic Matter Content section

Reference for "HS had the least permeable and most compacted sediments, which can stunt vegetation root growth."

Sediment Grain Size section

Following sentence does not appear to be the case when compared to Table 4. Clarify. "The sand fraction was greater at the HS and reduced at the LS and NS".

Discussion

Hydrologic Features

"The turbidity and wave power were highly correlated (r^2 = 0.85)". Cannot be verified because only the average wave power is shown. Perhaps include the wave power determined at the individual sites in Appendix B.

Geomorphic Features

Fetch distance for ST seems very high (56.7 km). Perhaps clarify how this was measured

Data Interactions and a Conceptual Model

Clarify: "Shorelines that received high wave energy (Figure 7 A, B) had fewer dominant marsh species and this is probably because they tended to have steeper slopes". Previous sentence says quadrant B has a "shallower slope"

Conclusion

Consider clarifying "alternative": "This study showed that a LS is a potentially good alternative (to hardened) to help maintain a similar ecosystem to the NS while also slowing erosion rates."