Determining Effective Locations of Seagrass to Prevent Coastal Erosion

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For decades, coastal erosion has progressed without effective remediation; the process inhibits coastal populations, animals, and habitats in tandem to negatively impacting local economies. The threat of coastal erosion will only intensify as global warming exacerbates, as sea level rise will account for an attack on higher areas of beach profiles as well as a greater frequency of strong storms. Conventional coastal engineering practices of hard structures, such as jetties or sea walls, have been implemented for decades and yet the threat has not been mitigated, suggesting the need for a different and more sustainable approach. Ecosystem-based solutions, especially those incorporating seagrass, prove to be promising as they act as wave attenuators and increase sediment stabilization, which help to reduce wave energy and subsequently erosion. Though seagrass has been regarded as a potential solution in recent years, no engineer has proposed how to implement it to shorelines effectively. This study proposed the creation of a wave tank to simulate a scaled down representation of coastal erosion where seagrass could be introduced as a prevention strategy. Two sites, at the berm and at an offshore bar, were tested with artificial seagrass and its bare-site equivalent, which were then compared through two-sample t-tests. The location of seagrass adjacent to the berm proved to be most effective, which was shown through reduced shoreline retreat and lower classified erosional regimes. This research should help aid the decision to implement seagrass on beaches as preventative strategies in the future.

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