

Recycled Glass Cullet as an Alternative to Dredged Sediments for Coastal Replenishment

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ABSTRACT

The altering of the continental shelf by dredging causes excess amounts of erosion putting coastal environments at a higher risk of exposure to coastal processes. As an alternative to dredging, recycled glass has been considered for use as a feasible and environmentally friendly material for coastal replenishment. Studies have shown that the use of recycled glass cullet possesses the same physical and chemical properties as natural quartz sand, which is the most common type of sand found on beaches. A field study conducted in coastal Mississippi (Ocean Springs and Biloxi) in which changes in beach elevation and variations in depth of the top layer of sand were monitored. Sand samples were also collected and analyzed showing that the size of the sand grains were comparable in size to the glass cullet. A comparative cost estimate shows glass cullet is a feasible option for an alternative aggregate for beach replenishment. The use of analytical spectral data (ASD) shows the compositional differences between glass cullet and the natural sediment, and can allow for advanced tracking of the alternative aggregate. Possible outlets for this study, once completed, are the U.S. Army Corps of Engineers, local and state governments along the Gulf Coast, as well as small island countries.