

## Analysis of Geomorphic History and Restoration Efforts at Raccoon Island

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### Abstract

Louisiana barrier islands are rapidly eroding due to extreme storm events, cold fronts, relative sea level rise, and subsidence. Raccoon Island is one of the fastest eroding barrier islands in south Louisiana and in the United States. The island is of importance because it is home to the first federally funded restoration project, home to the only shorebird rookery west of the Mississippi River in Louisiana and was impacted by two major storms. The objective of this study is to analyze the restoration efforts and the geomorphic history of Raccoon Island in order to address the most effective restoration method for saving Louisiana's barrier islands.

The highest rates of storm deposition occurred behind the the Coastal Wetlands Planning, Protection and Restoration Act TE-29 breakwaters and as storm overwash into the backbarrier of Raccoon Island. The high rate of deposition is due to the transport of sand onshore and offshore due to extreme storm events such as Tropical Storm Isidore and Hurricane Lili. The TE-29 breakwaters are interfering with longshore, onshore, and offshore sediment transport onto Raccoon Island. Therefore, the breakwaters are acting as a sink for sand required to maintain barrier profile integrity during landward migration of the transgressive barrier island. The shore parallel offshore Raccoon Island is the source of post-Isidore and Lili overwash and source of sand nourishment for Raccoon Island recurved spit. Raccoon Island is dependent on this sand nourishment for the sustainability of the island.

If certain coastal processes are not aiding in the nourishment of Raccoon Island, the western spit of the island will continue to be sediment starved and will become an inner shelf shoal much like Trinity Shoal and Ship Shoal located offshore of the Isles Dernieres. In this study, there were two modes of restoration which were analyzed. It is evident that longshore sediment transport is inhibited with the presence of the TE-29 breakwaters and the western spit of the island is in the process of transforming to an inner shelf shoal. Coastal scientists and engineers should analyze the results of this project and use this geomorphic information when deciding on templates for effective restoration of Raccoon Island.