Geomorphology and Depositional Subenvironments of Gulf Islands National Seashore: Tile 3, Horn Island, Mississippi

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Project Description

The U.S. Geological Survey (USGS) is studying coastal hazards and coastal change to improve our understanding of coastal ecosystems and to develop better capabilities of predicting future coastal change. This approach to understanding the dynamic of coastal systems is to monitor changes in barrier island ecosystems through time. This involves examining morphological and topographic change at temporal scales ranging from minutes to years and spatial scales ranging from feet to kilometers to meters. Of particular interest are the processes that produce these changes and the determination of whether or not these processes are likely to persist into the future. In these analyses of hazards and change, both natural and anthropogenic influences are considered. Quantitative analysis of these processes and tracing the principal factors that promote these changes is critical to predicting what changes are likely to occur under different scenarios, such as short-term impacts of extreme storms or long-term effects of sea-level rise.

Data Description

The barrier island classification was referred to and mapped using September 2007 high-resolution orthorectified aerial photography from the National Agriculture Imagery Program (NAIP), October 2007 low-altitude color video of the Mississippi barrier islands acquired from Great Divide Pictures under contract to the National Park Service, and June 2007 1-meter-resolution Experimental Advanced Airborne Research Lidar (EAARL) data collected by National Aeronautics and Space Administration (NASA) and the USGS. Each geomorphic layer is stored in standard shapefile format viewable in any GIS software.

Further Reading


Waller, G.H. and MacBride, L.P., 1970, Temporal changes in the offshore islands of Mississippi, Mississippi State University Water Resources Research Institute, 199 p.

Natural Features

Active-Dune Complex

Sand or sand-barren areas of dunes or linear dune fields that are frequently inundated with salt water. These are often composed of a combination of sand and other sediment types, typically having large-scale linear or curvilinear dune fields that are highly dynamic due to wind and wave change.

Beach Ridge Complex

A low, relatively flat interior part of the barrier island that is densely vegetated in some places and at the same time is relatively stable, such as the beach ridge complex, and those which are highly dynamic, such as the beach and active overwash zones.

Beach

A mostly unvegetated strip of sand parallel to the shore that extends from the water to the seaward edge of the dunes or washover terrace. The seaward part of the beach is regularly inundated by wave run-up during high-water conditions, whereas the landward part of the beach is minimally inundated by wave run-up during storms.

Berm

Unclassified water data surrounding a barrier island or small bodies of permanent water within the boundaries of an island. Typically marshy or vegetated with low-lying vegetation.

Classification Extent

Classifications are made for barriers, including buildings, building pads, roads, and wetlands, and are based on phytotaxonomic evidence.