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 dynamics of coastal systems is to monitor changes in barrier-island subenvironments through time. This involves examining morphological and topographic change at temporal scales ranging from centuries to years and spatial scales ranging from tens of 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. Quantifying past morphodynamics and rates of coastal change and linking the principal factors that govern these changes are critical to predicting what changes are likely to occur under different scenarios, such as alternative impacts of extreme storms or long-term impacts of sea-level rise.

The Mississippi-Alabama barrier islands and the adjacent coastal landscapes have been under the influence of anthropogenic activities, such as land development along the islands' coastlines and/or on the adjacent mainland areas, over the past several decades. The islands are actively monitored with high-resolution LiDAR and orthophotography because these islands offer a diversity of depositional subenvironments and the islands' mass and position have changed substantially in historical time. The geomorphology and subenvironmental maps emphasize the processes that formed the natural features and also serve as a basis for documenting which subenvironments are relatively stable, such as the beach ridge complex, and those which are highly dynamic, such as the beach and active overwash zones.

**Classification Extent**
- Gulf Islands National Seashore
- Mississippi
- Alabama
- Louisiana
- Florida

**Natural Features**
- **Active Dune Complex**: Barren to sparsely vegetated mounds or ridges of wind-blown sand that form hummocky topography landward of the beach.
- **Stable Dune Complex**: Barren to sparsely vegetated mounds or ridges of sand that are generally low and maintained by wave processes. The sediments that make up these dunes are generally well sorted and consist primarily of fine and medium sand.
- **Active Overwash Zone**: A low, relatively flat interior part of the barrier island that is densely vegetated in some places and at the same time is sparsely vegetated in other places, both by salt-tolerant grasses.
- **Inactive Overwash Zone**: A mostly unvegetated strip of sand parallel to the shore that extends from the water to the seaward edge of the dunes or crest of the beach ridge complex. The seaward part of the beach is regularly inundated by wave run-up during high-water phases of the tide.
- **Data Description**
- The barrier-island classification was referenced and mapped using September 2007 high-resolution enhanced LiDAR from 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**

The barrier-island classification was referenced and mapped using September 2007 high-resolution enhanced LiDAR from National Aeronautics and Space Administration (NASA) and the USGS. Each geomorphic layer is stored in standard shapefile format viewable in any GIS software.