Coast and Shoreline

Florida's geologic history is complex. The exposed portion of the peninsula increased or diminished in response to the advances and retreats of the North American glaciers during the Woodfordian Sub-age of the Pleistocene epoch (21,000-10,500 B.C.). Several former shorelines can be seen driving from the South District ranger station to the beach in the alternating ridge (former dunelines) and swale topography. At the point of maximum glaciation (16,000 B.C.) sea level was about 100 meters below the present level. With the retreat of the last glaciers and corresponding sea level rise about 7,000 years ago, Canaveral National Seashore's (CANA) barrier island and Mosquito Lagoon were formed.

CANA's 24 mile stretch of barrier island is a thin ribbon of sand lying between the ocean and Mosquito Lagoon. In some places it is no more than 100 yards wide. Unlike many barrier islands with primary and secondary dunes, CANA has only a single dune, The island provides an important buffer against tropical storms and hurricanes, absorbing the initial brunt of wind and waves. Erosion and shoreline retreat are critical issues at CANA and other coastal parks. Major storm events will sometimes cause washovers where the ocean surges across the island eroding sections of the dune, transporting sand to the back side of the island. Thus the island is slowly migrating towards the mainland.

Barrier islands are dynamic systems in a delicate balance. The sand on cana's beach is constantly moving, being eroded and then replenished. In summer, ocean waters are calmer and sand is deposited on the beach, at times several feet deep. In the winter, seas are rougher and beach sand is carried offshore. In addition to this east and west pattern, sand migrates north-south along the coast. The general pattern in Florida is southward, although at CANA there are cells where movement is northward. Man-made structures often upset this natural system of replenishment. In the 1980's a rock revetment was constructed just north of the park boundary to protect houses built on the dune. This may alter normal flow of sand southward to CANA and cause erosion along the park's beach. Studies have revealed a change in nearshore currents, but no significant erosion to date.

A hurricane level storm may breach the dune and create one or more inlets, at least on a temporary basis. The importance of this issue is increased at CANA due to the presence of NASA facilities (roadways and camera observation pads) just behind the dune, along the southern six miles of the park. Since the lagoon's creation about 7000 years ago, five different inlets have existed between the south end of Mosquito Lagoon and Turtle Mound in the north end of the park. The location of these can be easily seen on a map or photograph. Look for wider areas of the barrier island where high marsh and mangrove areas bulge into the lagoon. The last to close was at Turtle Mound about 500 B.C. Now the nearest inlet is Ponce De Leon about 10 miles north of the park.

CANA's dune serves as the backbone of the island, providing critical stability. To learn how the park is seeking to protect it, see the section titled Sand Dunes. Since erosion is a major concern, the park is working with NASA and the adjacent Merritt Island National Wildlife Refuge to establish a long-term monitoring system that will track shoreline changes and identify areas particularly vulnerable to erosion. A uniform shoreline monitoring system for all of the National Park Service seashore parks is also being developed.