Fort Matanzas

National Park Service
U.S. Department of the Interior

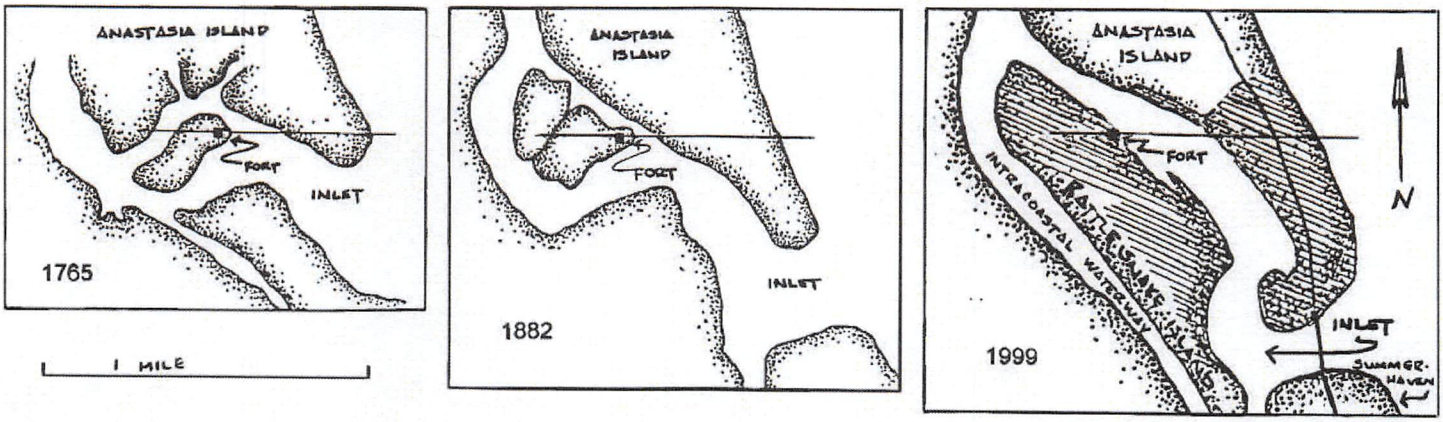
Fort Matanzas National Monument

Barrier Islands -- The Changing Landscape of Matanzas

Barrier islands move. After all, these narrow islands along the coasts are merely piles of sand built up over time by ocean currents, waves, and wind. Scientists debate exactly how these islands formed. One theory is that at the end of the last ice age about 12,000 years ago, when so much sea water lay frozen, trapped in glaciers, the east coast of much of North America extended perhaps 100 miles (60 km) further into the Atlantic Ocean than it does now. As the ice melted and the sea level rose, this vast shoreline was inundated, and the sea began to shape this flooded plain into piles of sand along the coast-- the barrier islands.

In Florida seaside currents move along the shore from the north to the south. These currents gradually wear away the north end of the islands and deposit the sand at the south end where the tidal current moving out through the inlet between two barrier islands stops the flow of the longshore current. Storms, especially hurricanes and nor'easters, pound the shoreline, sometimes making new inlets or over-washing the island. Tidal currents often form hooks and sandbars at inlets where there are no jetties or seawalls.

This is what has happened at the Matanzas Inlet, the only "natural" inlet left on the east coast of Florida. The inlet is not dredged or marked. There are no groins or jetties, and the sand comes and goes as nature wills. Every year the hook on the inside of the inlet grows a little, and the island creeps south. We know by comparing charts from the present time with those from the mid-1700s that over the past two and a half centuries, Anastasia Island has "migrated" south, moving the inlet about 1/2 mile (650 meters) south of where it was when Fort Matanzas was built in 1740-1742. Standing on the gun deck of Fort Matanzas, a soldier would be looking directly out into the ocean. (See drawings below)



Because they are so dynamic, barrier islands play an important role in protecting the mainland from storms. The beaches absorb the energy of the waves like a coquina wall absorbs the shock of a cannon ball hit. The sand gives and shifts, the energy is dispersed, and the mainland receives less of the storm's force. It's a part of nature for these islands to move.

Often, however, people try to control the movement of barrier islands by building jetties at inlets or piers or groins vertical to the shore. These might catch the sand drifting down from the north, but then the shoreline south of the jetty is starved for sand and begins to wash away. This is what is happening at the north end of Anastasia Island and what happened at Cape Hatteras, North Carolina making it necessary to move the lighthouse as the ocean washed closer.

And yet people still build houses on these islands that move.
