

No. 03

VIRGINIA KEY BEACH COUNTY PARK

(v.1.0, 5-06)

Prepared by Grenville Draper
Department of Earth Sciences

Location and access

Take the Rickenbacker Causeway as if going to the beaches on Key Biscayne. Just after passing the Seaquarium (and just before the bridge to Key Biscayne), turn left on the road that leads to the water treatment plant and the parking area for Virginia Key beach. (Unless you have made prior arrangements, you will have to pay the entrance fee to the park). Continue until the fork in the road, then turn right into the parking area.

What there is to see

Aspects of beach dynamics and erosion.

Background

Like Miami Beach and Key Biscayne, Virginia Key is a sedimentary barrier island. Virginia Key and Key Biscayne are parts of the barrier island system which stretches along most of the coast of southeastern Florida.

About 20,000 years ago, a glacial period ended and the climate began to warm. During the glacial period, sea level had been as much as 100m. (300 ft.) below present sea level. As the climate warmed, sea level started to rise to its present level. It is from this period that the barrier islands of Miami Beach, Virginia Key, and Key Biscayne began to be formed. Sediments were carried by longshore currents, and consisted of a mixture of carbonate (shell fragments, coral fragments, etc.) and quartz sand. Progressive accumulation of sands slowly built-up the structure of the islands as they exist today.

In recent times, urbanization of the area has changed the coastal dynamics of these Keys so that at present erosion tends to prevail. In fact, at one point, Miami Beach and Virginia Key were a continuous island, until the hurricane of 1835, which formed a shallow tidal washover that is now know as Norris Cut. This remained so until the early 1920's, when Carl Fisher deepened the cut and built up what is now Fisher Island. This was not the first artificial channel, as Government Cut had already been completed by 1905.

Because of the construction of Government and Norris Cuts, the sediment carried by longshore drift was diverted into Biscayne Bay, effectively cutting off the supply of sand to the islands immediately to the south. Consequently, they lost their natural replenishment. Severe erosional problems have plagued Virginia Key and Key Biscayne ever since.

On entering the beach area several jetties can be seen. These jetties extend perpendicular to the coast line from the beach and were constructed (at great cost) to try to slow erosion. These jetties are known as permeable groins (permeable because they allow the water to pass through, but not the sand). These are composed of igneous and metamorphic rocks from the southern Appalachians. Such rocks have to be used because the local limestone is too soft and easily