Natural Resources Management
Cape Sable Canals

National Park Service
U.S. Department of the Interior

South Florida Natural Resources Center
Everglades National Park

"All the Cape Sable peninsula is a wild, tangled, pathless mangrove swamp, extending back a number of miles to the open sawgrass marshes of the Everglades. In the embraces of this swamp lie a series of shallow lakes with muddy bottoms… The whole region is as flat as a floor, and hardly above the level of the sea."

– Herbert K. Job. *Wild Wings*. 1905.

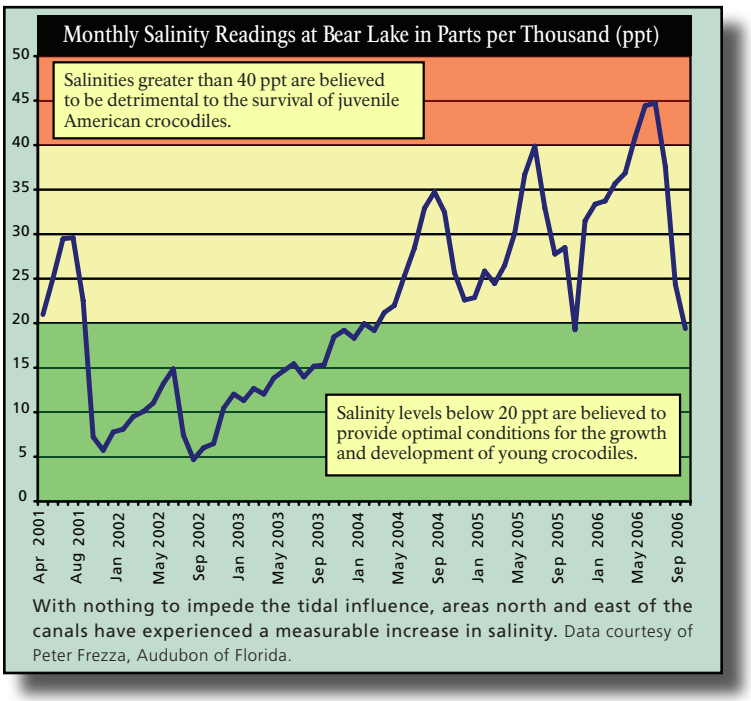
The southernmost point in the continental United States, the Cape Sable peninsula extends from the southwestern tip of Florida into the Gulf of Mexico and Florida Bay. Situated within Everglades National Park, the cape contains stretches of shell beaches fringed by a mix of mangrove trees and marsh. Beyond the mangroves lies Lake Ingraham, the largest of the cape's lakes. The lake is backed by a narrow marl ridge that shelters the cape's numerous interior freshwater marshes.

The peninsula remained relatively untouched by humans until the early 20th century, when the pathless swamp described by ornithologist Herbert Job in his 1905 book became marred by a network of canals dredged through the marl ridge. Built to drain the cape's interior marshes for use in agriculture and cattle grazing, the canals have triggered significant change in the ecology of the area.

At least seven canals were constructed, exposing the cape's interior marshes and lakes to the sea. Incoming tides now push marine waters and sediments inland, increasing salinity and transporting sediments to lakes and marshes. Outgoing tides flush freshwater from marshes north of the marl ridge and transport sediments toward Lake Ingraham and Florida Bay.

The constant movement of water along the cape has led to the widening of several canals. One of the channels has widened from 20 feet to more than 300 feet, resulting in a significant loss of coastal habitat. The expansion of these canals has exacerbated sediment deposition in the cape's open waters and is converting Lake Ingraham into a tidal mud flat.

The freshwater ecosystems of Cape Sable have experienced significant change from exposure to the sea. Sawgrass communities have converted to mangrove forests and the number of alligators and other freshwater species has declined. Higher salinity in the interior marshes has altered vegetation patterns, reduced the quality of wildlife habitat, and lowered the productivity of forage fishes, potentially impacting the survival of various wading birds. Greater volumes of seawater and sediment entering the lakes and marshes have brought about changes that are compromising the function of coastal habitats important to sea turtles, recreational fish, and other plants and animals dependent on the cape for survival.



With nothing to impede the tidal influence, areas north and east of the canals have experienced a measurable increase in salinity. Data courtesy of Peter Frezza, Audubon of Florida.

East Cape Canal and sedimentation
Photo courtesy of Brigitte Vlaswinkel, University of Miami

Canals Trigger Accelerated Change

Over the course of millennia, fire, water, and weather have worked together to define Cape Sable as we know it today. During this time, a diverse assemblage of life has adapted to an existence of periodic change brought about by flood, frost, and the occasional hurricane.

While this landscape is naturally dynamic, recent times have seen accelerated, human-induced changes on the cape. In relatively short order, the canals constructed only a century ago have altered salinity, sedimentation, and erosion patterns over vast areas. Plants and animals that have persisted for hundreds of years on Cape Sable have been unable to keep pace with the rapid changes to their habitat. As the canals on Cape Sable continue to widen, it is believed the rate of change will continue to accelerate, emphasizing the need for timely corrective action. Resource managers fear that predicted impacts from climate change may also serve to compound and exacerbate this growing problem.

- **Failed Dams**

Breaches in two sheet-piling dams at East Cape and Homestead Canals have reduced their ability to stop the inflow of saltwater. Photo by Mike Savage, ENP.

Saline water entering Cape Sable has resulted in the collapse of freshwater marshes and the subsequent erosion of over two feet of soil. Photo courtesy of Harold Wanless, University of Miami.

Repairing the Damage From Canals

Park management has long recognized the importance of addressing impacts from the Cape Sable canals. Stopping tidal flow into the cape's interior marshes is the key to revitalizing the function of these freshwater wetlands. Slowing the rate of change on this landscape may also bring about greater resilience to the cape, and its residents, in the face of predicted sea level rise and the possibility of more frequent and intense hurricanes.

The park plugged several of the canals at the marl ridge with earthen dams in the late 1950s and early 1960s. Over time, natural forces compromised two of these early structures and, by 1992, they had failed. The earthen dams were replaced in 1997 with sheet-piling dams, though these also failed. Funded in part by the U.S. Fish and Wildlife Service, park managers are currently evaluating alternatives for repairing or replacing these sheet-piling dams in the near future.

Wilderness & Public Safety

In 1978, nearly 1.3 million acres of land in Everglades National Park were designated as the Marjory Stoneman Douglas Wilderness, including most areas of Cape Sable. Created by an act of Congress, the designation mandates minimal human disturbance in an effort to preserve the area's resources in their wild and primitive natural condition.

Public access to the wilderness area beyond the dams is limited to non-motorized vessels. Still, the cape's interior marshes have historically supported a variety of brackish and freshwater fish species, and the promise of this fertile fishing ground continues to lure anglers up the canals into the wilderness area. Unfortunately, water flow near the breaches is now extremely fast and presents a danger to all types of vessels. The sheet piling dams are difficult to see at high tide and can cause boats to capsize on contact.

Park managers are currently investigating how best to rehabilitate the failed barriers, while simultaneously providing safe access for non-motorized vessels in the future. In the interim, the park has installed temporary cables and floats to discourage illegal entry by motorboats. Canoes and kayaks, though still permitted to cross, are encouraged to avoid the cabled area due to swift currents that can make navigation a difficult and dangerous task.

Through active restoration of the Cape Sable canals and by providing safe access to the cape, the National Park Service hopes to slow the rate of human-induced change, restore the quality of important wildlife habitat, and enhance opportunities to experience the beauty of the cape for years to come.