

Long-Term Stability of the Coastal Everglades: Disturbance, Sea-Level Rise, and Peat Collapse

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The majority of Everglades National Park is comprised of marine and estuarine habitats, a fact often overlooked by resource managers. The mangrove forests and salt marshes of the southwest Everglades provide important habitat for a variety of species, many of commercial or recreational importance and some endangered. Analysis of historical maps, charts, and aerial photographs indicates that portions of the coastal Everglades have undergone rapid change from one habitat type to another. For example, since 1927, 1,496 ha of marl-prairie marsh on Cape Sable have converted to open water, and 645 ha of fringing mangrove forest along Big Sable Creek have converted to barren, intertidal mudflats. In the region between Chatham and Lopez Rivers, large tracts of marsh have converted to mangrove forest, whereas between the Chatham and Lostmans Rivers, mangrove forest has become open water. These changes may be the result of a 22-cm rise in sea level over the past 75 years, the passage of several hurricanes across southern Florida, or, for Cape Sable, the construction of canals for drainage purposes. To assess the specific causes of habitat change, we compared 1927 and 1999 aerial photos to quantify and classify the type of habitat loss, examined core samples to assess subsurface processes contributing to these phenomena, measured sediment accretion and/or erosion, and assessed mangrove vegetation growth. Our preliminary findings indicate little correlation between the subsurface stratigraphy and habitat loss for interior marshes on Cape Sable. For the mangrove wetlands along Big Sable Creek, sediment elevation is decreasing, and mangrove vegetation has low growth and high mortality. We hypothesize that this habitat loss may be the result of hurricanes in 1935 and 1960, combined with sea-level rise, which led to peat collapse and conversion from mangrove forest to intertidal mudflat.