

Sea Level and Storm Trends, Everglades National Park

University of Colorado, Department of Geological Sciences, Boulder, Colorado

Contacts: Maria Caffrey, maria.caffrey@colorado.edu; Rebecca Beavers, rebecca_beavers@nps.gov

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Sea Level Summary

Historical tide gauge data from the Miami Beach, FL tide gauge show that sea level around Everglades National Park (EVER) is rising (IPCC 2013; NOAA tides and currents 2012; Figure 1). EVER has not been directly in the path of a hurricane-strength storm; however it has been struck by thirty-three tropical- and extratropical storms over the last century. Storms are expected to intensify over the next century. At least one Saffir-Simpson category 1 hurricane should be expected to travel up to EVER by 2100.

Table 1. Historical and projected sea level and storm trends for Everglades National Park.

Sea Level and Storm Surge Trends, Everglades National Park		2050 ²	2100 ³
Historical sea level trend, 1931–1981	+0.09 in/yr		
Number of tropical storms, depressions and subtropical storm paths within 10 miles of Everglades, 1842–2014	58		
Estimated storm surge height ¹ (Category 1, mean tide), 2014	3.6 ft		
Estimated storm surge height ¹ (Category 4, mean tide), 2014	16.0 ft		
Low Emissions Scenario (RCP 4.5) ¹ Projected sea level		+0.77 ft	+1.76 ft
Intermediate Emissions Scenario (RCP 6.0) Projected sea level ¹		+0.72 ft	+1.83 ft
High Emissions Scenario (RCP 8.5) ¹ Projected sea level		+0.79 ft	+2.26 ft

¹Sea level and storm surge heights are projected on top of current mean sea level for the Flamingo visitor center area. It should be expected that potential storm surge heights will change over time based on changes in mean sea level.

²Calculated by Caffrey and colleagues using IPCC data.

³Ensemble mean based on data used for figure 13.20 by the IPCC (2013).

Sea Level Change and Storm Surge Vulnerability at Everglades National Park

- Increasing sea levels may lead to loss of land and critical habitat.
- Increased erosion and/or accretion across the coastline by storms coupled with shorelines adjusting to new mean sea levels.
- Rising groundwater tables and possible salt water intrusion due to rising sea levels.
- Increased risk of high intensity storm events.
- Potential loss of nearby freshwater ecosystems as sea levels rise.

References for Additional Sea Level and Storm Surge Information

- Intergovernmental Panel on Climate Change: <http://www.climatechange2013.org/report/>
- USACE Sea Level Calculator: <http://www.corpsclimate.us/ccaceslcurves.cfm>
- NOAA Tides and Currents: <http://tidesandcurrents.noaa.gov>
- NPS Storm Surge Mapping: <http://mariacaffrey.com/>
- NOAA Historical Storm Data: <http://www.ncdc.noaa.gov/ibtracs/>

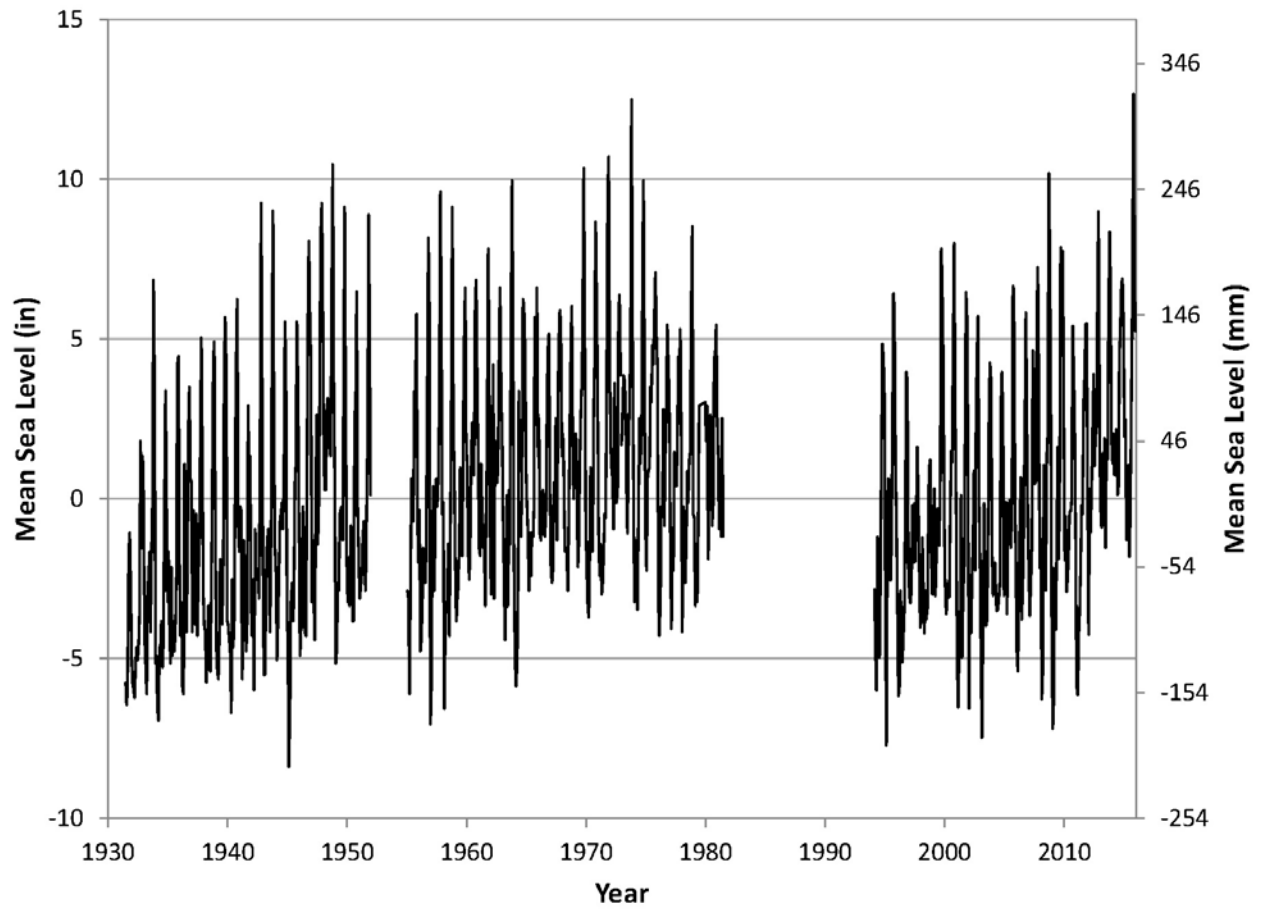


Figure 1. Sea level trends for Miami Beach (1931–1981) and Virginia Key (1994–2015) tide gauges.

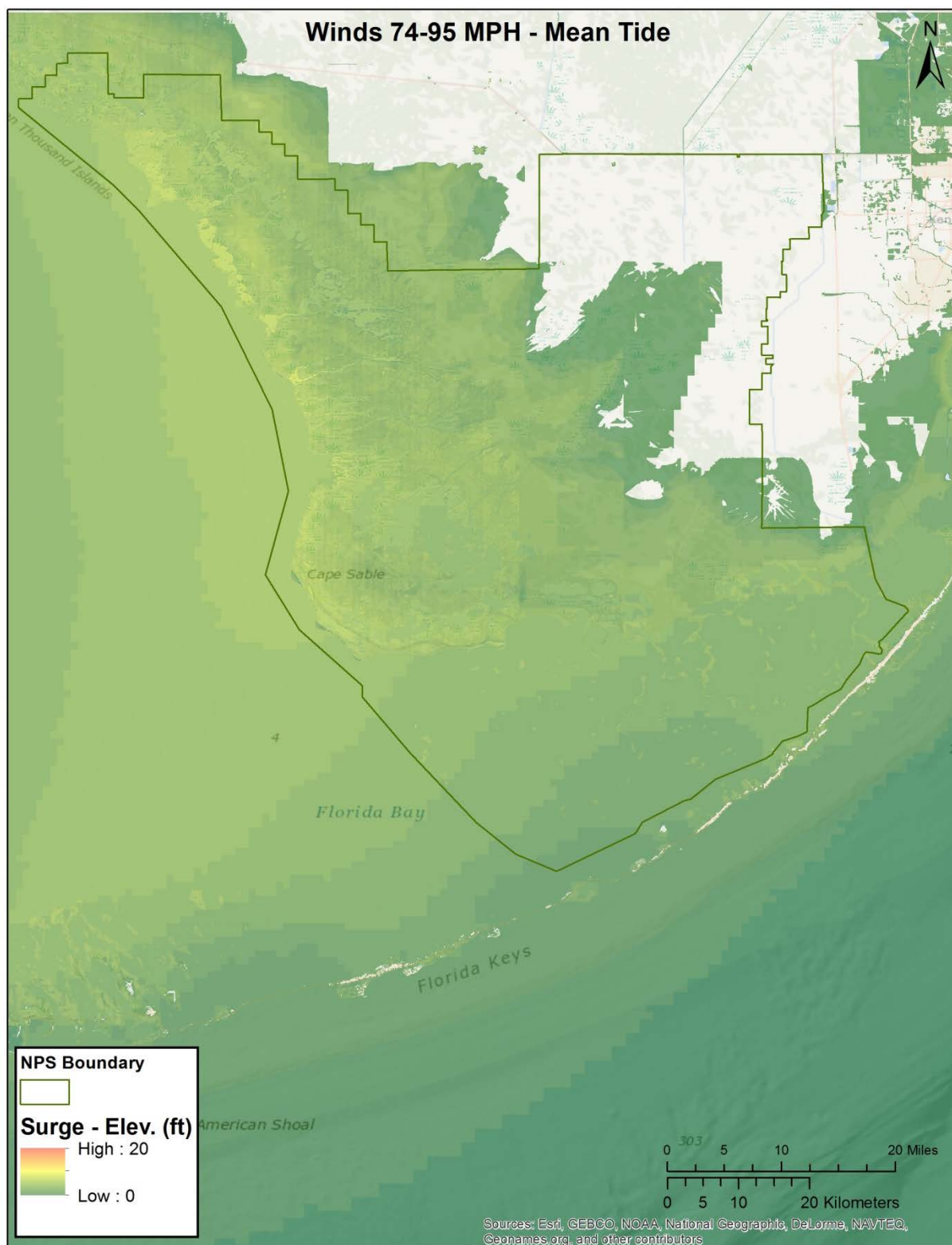


Figure 2. Potential storm surge height and extent of a Saffir-Simpson category 1 hurricane striking during mean tide. More maps are available at: <https://www.flickr.com/photos/125040673@N03/sets/>

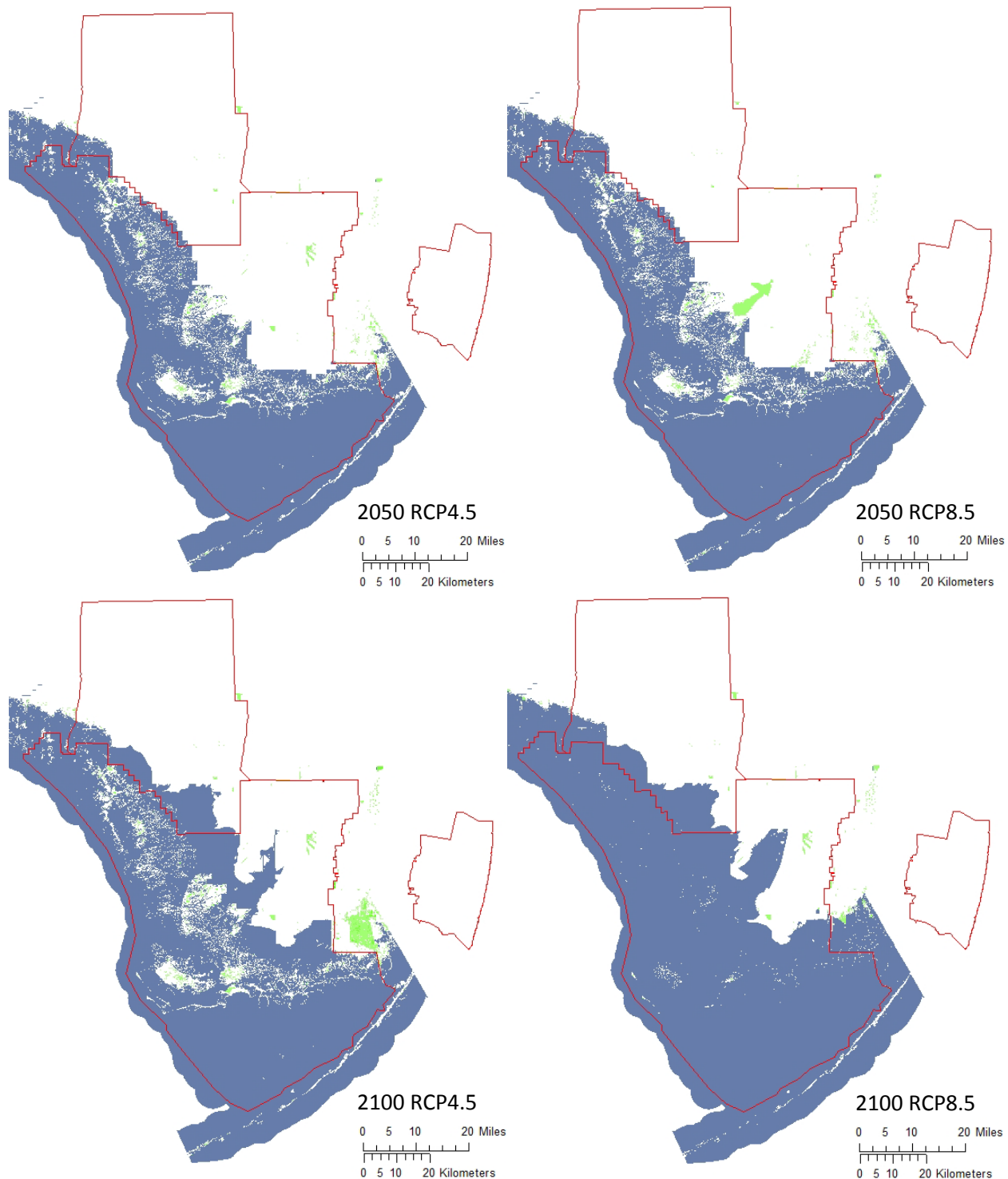


Figure 3. Sea level rise maps for two climate change scenarios (RCP4.5 and RCP8.5) over two time periods (2050 and 2100). Blue represents the region likely to be permanently flooded (mapped above MHHW). Green represents isolated low lying areas that could potentially be flooded if a pathway existed.