



Betty Staugler  
 UF IFAS Ext., Fla. Sea Grant  
[staugler@ufl.edu](mailto:staugler@ufl.edu)  
 941-764-4346

Jim Beever  
 SW Fla. Reg'l Planning Council  
[jbeever@swfrpc.org](mailto:jbeever@swfrpc.org)  
 239-338-2550 ext. 224

Thomas Ruppert  
 Florida Sea Grant  
[truppert@ufl.edu](mailto:truppert@ufl.edu)  
 352-392-5870

## Sea-level rise and Charlotte County: Summary of Important Points

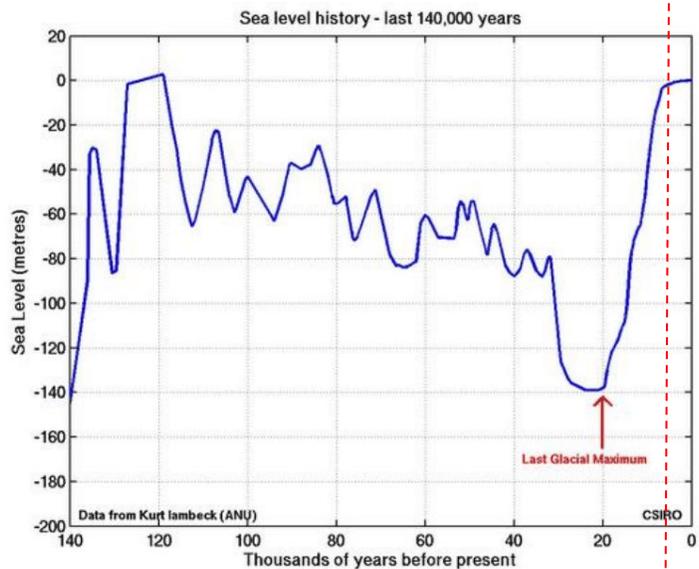
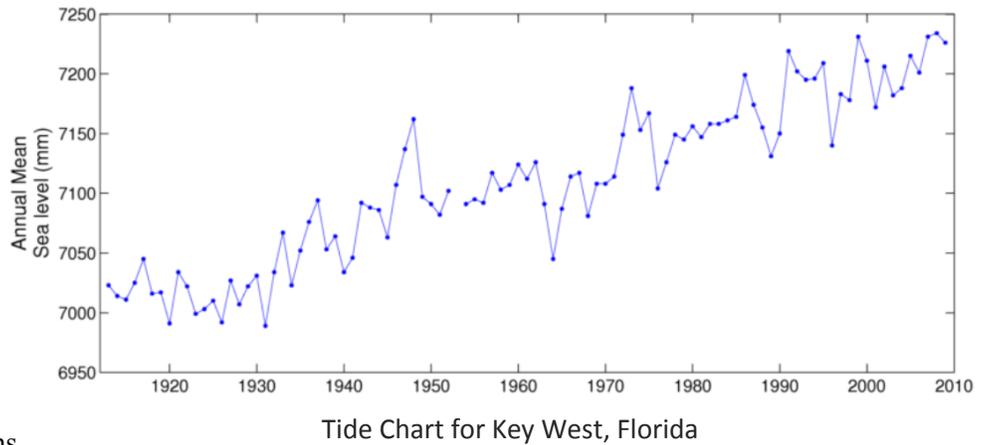
Sea levels are currently rising.

Changing sea levels are nothing new to Florida measured over many millennia. However, today's Florida is different from the one that adapted to past changes in sea level. Today Florida's coast is home to millions and teems with billions of dollars of investment.

The rising sea levels of today result from two main causes: 1) thermal expansion—as water in the oceans warms, it expands; and 2) melting of land-based ice is adding to the amount of water in the oceans.

Sea levels around Florida's coast are expected to rise about 3-7 inches by 2030 and by 9-24 inches by 2060.<sup>1</sup> Greater variation arises when estimating out to the year 2100. Most estimates for 2100 are centered at about 3 feet.

Higher sea levels mean more coastal flooding. Recent research indicates that in southwest Florida, a flood that previously would have had a 1% chance of occurring each year (i.e.—a "100-year flood") will increase to a 20% chance by 2050. In other words, a 100-year storm will become a 20-year storm.



During about 5,000 years of recorded human history, sea levels have been remarkably stable. Thus our perspective has been that static sea levels are "normal."

<sup>1</sup> Estimates from the Southeast Florida Climate Compact's "A Unified Sea Level Rise Projection for Southeast Florida," which incorporates the methodology for estimating sea-level rise that was developed by the U.S. Army Corps of Engineers.

# Florida’s built and natural environments are exceptionally vulnerable to impacts of sea-level rise due to our low, flat topography and large coastal population.

## Projected Impacts Related to our Built Environment:

- Increased storm surge
- Decreased capacity and rate of gravity drainage causes more rainfall-induced flooding
- Increased infrastructure damage (from surge, flooding, and higher water table)
- Increased coastal erosion
- Significant amounts of critical facilities at much higher risk
- Saltwater intrusion decreasing availability of inexpensive potable ground water
- More breaching of barrier islands
- Increased strain on insurance and disaster relief; unsustainability of current systems?
- Negative impacts on fishing, beaches, and recreation if large-scale armoring/shoreline hardening is a response
- Loss of property tax revenue as land is lost

## Projected Impacts to the Natural Environment

Habitat	Sea Level Rise Effect	Potential Response
Seagrass bed	Increased depths	Migration up-gradient
Oyster bar	Increased salinity, Increased depths	Species loss, habitat migration up-gradient
Estuary	More open water, less seagrass, less tidal flat, more mangroves	Loss of submerged species, changes to communities
Mangroves	Migration, Drowning from overtopping pneumatophores, species change from altered salinities	Changes to species compositions and associated species, loss and/or increase of mangroves
Salt marsh	Migration, drowning, conversion to mangrove	Migration, habitat loss, change to communities, conversion to open water
Brackish marsh	Increased salinity, inundation	Changes to plant/animal communities, conversion to open water
Beaches and Dunes	Erosion	Overtopping of dunes, loss of habitat, migration
Coastal strand	Use by humans who relocate	Competition for space, migration, loss
Coastal scrub	Use by humans who relocate	Potential Response
Coastal pinewoods	Use by humans who relocate	Competition for space, migration, loss

Charlotte County should consider its options for adapting to rising sea levels. The first step is to understand the County’s vulnerability. Next comes assessing how to address those vulnerabilities. The County may wish to immediately evaluate its coastal management policies and implement the best possible coastal policies as these present good “no-regrets” strategies that improve the ability of the County to weather disasters even without considering sea-level rise. Florida Sea Grant, the Southwest Florida Regional Planning Council, the Charlotte Harbor National Estuary Program, and the University of Florida/IFAS program provide technical assistance to help communities adapt to rising sea levels.