

Coastal Wildscapes of Georgia A Geologic Perspective

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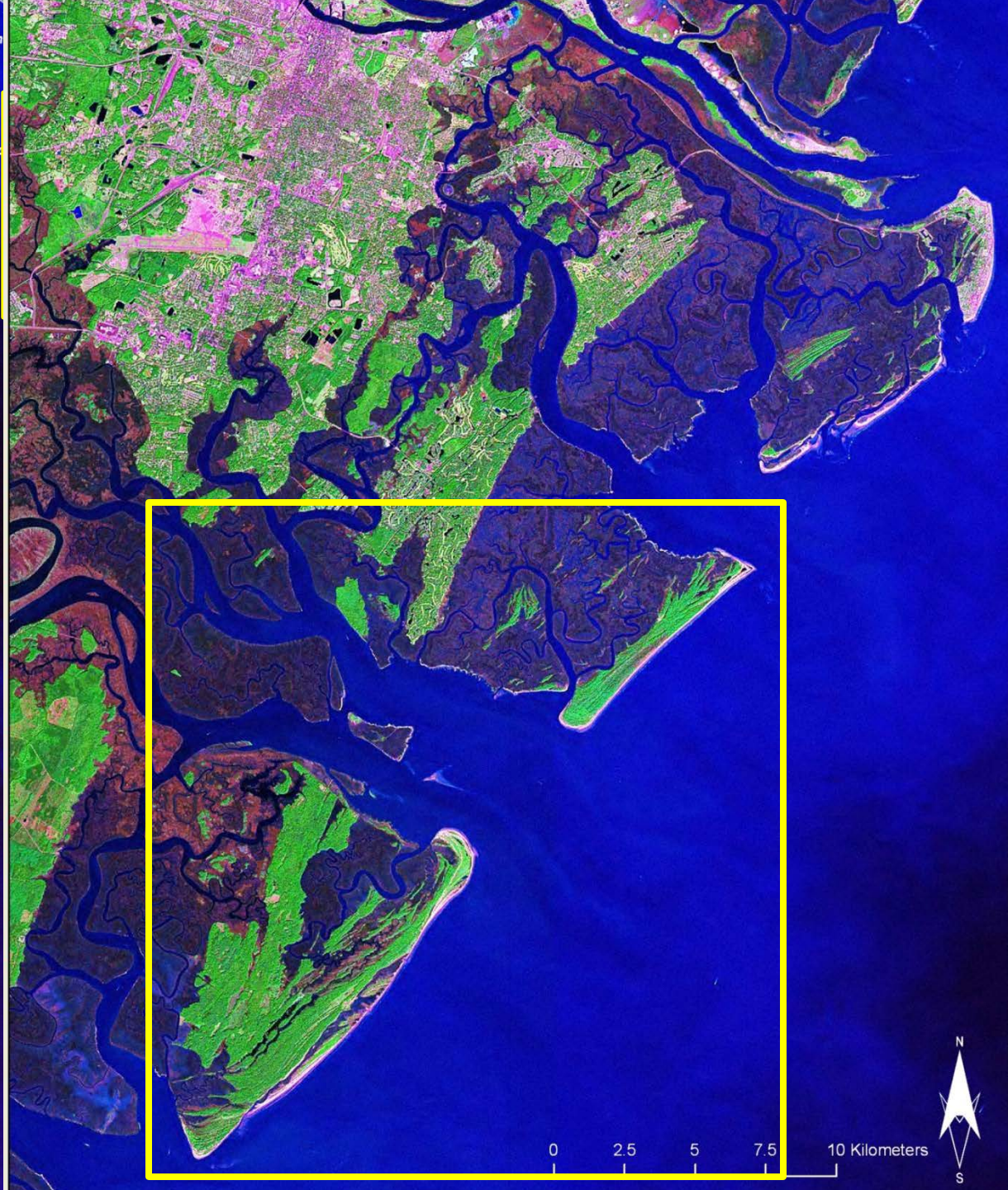
Physical Setting of the Georgia Coast

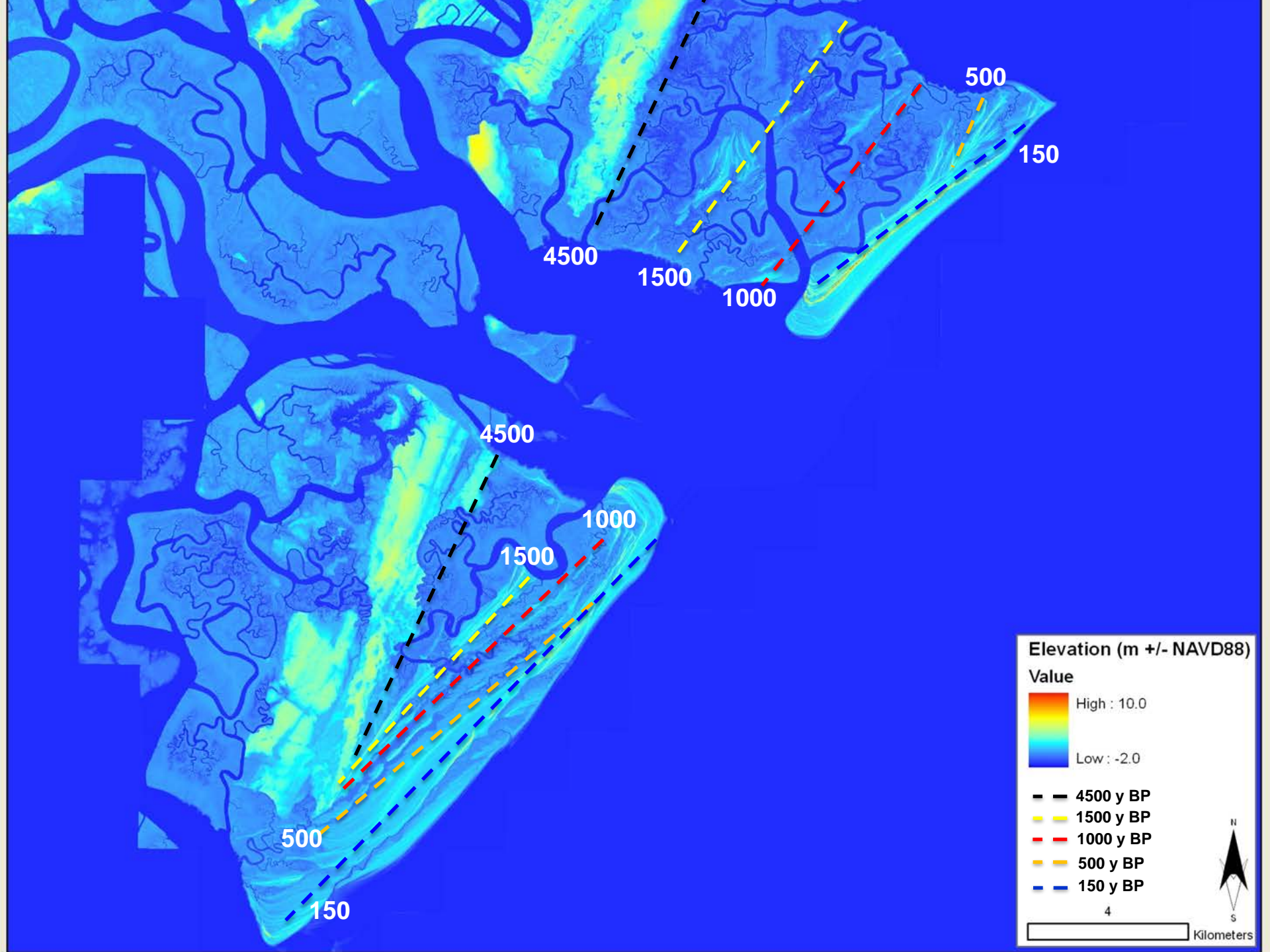
- High tidal range (10 ft)
- Low wave energy (2 ft)
- Swift tidal currents
- Large ebb-tidal deltas
- Different types of islands
- Significant sea level rise (~1ft/century)
- Multiple barrier island chains



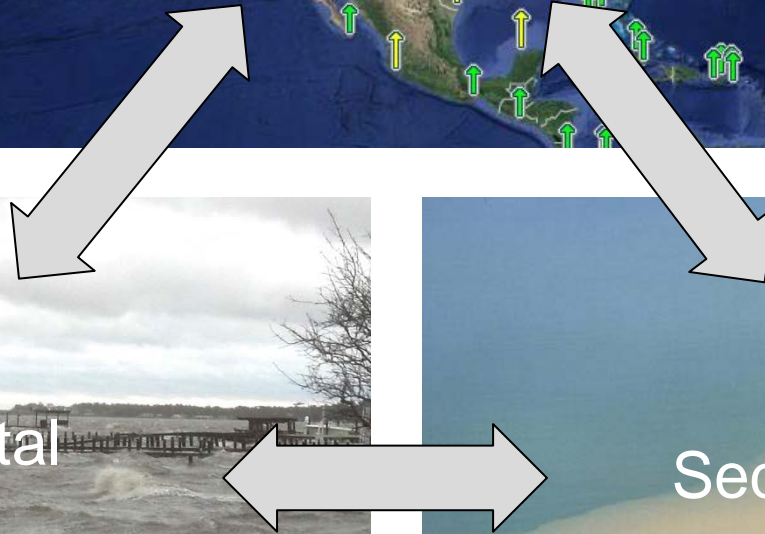
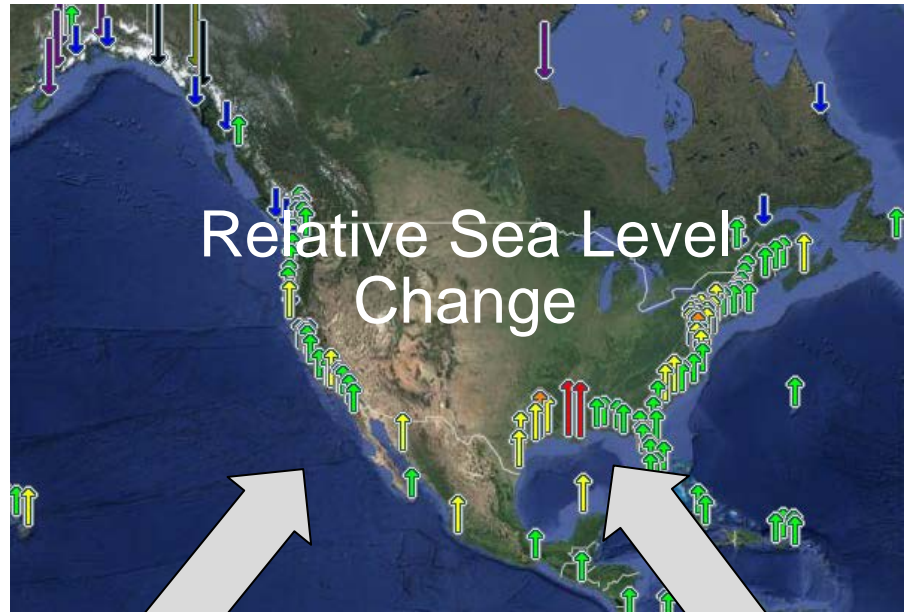
Components of the Georgia Coast

- 12 major barrier islands
- 3 developed barriers (public/private/State)
- 3 Federally managed (National wildlife refuges, national seashore) islands
- 2 State-managed islands
- 2 privately held islands
- 5 major rivers
- 7 major salt marsh estuaries

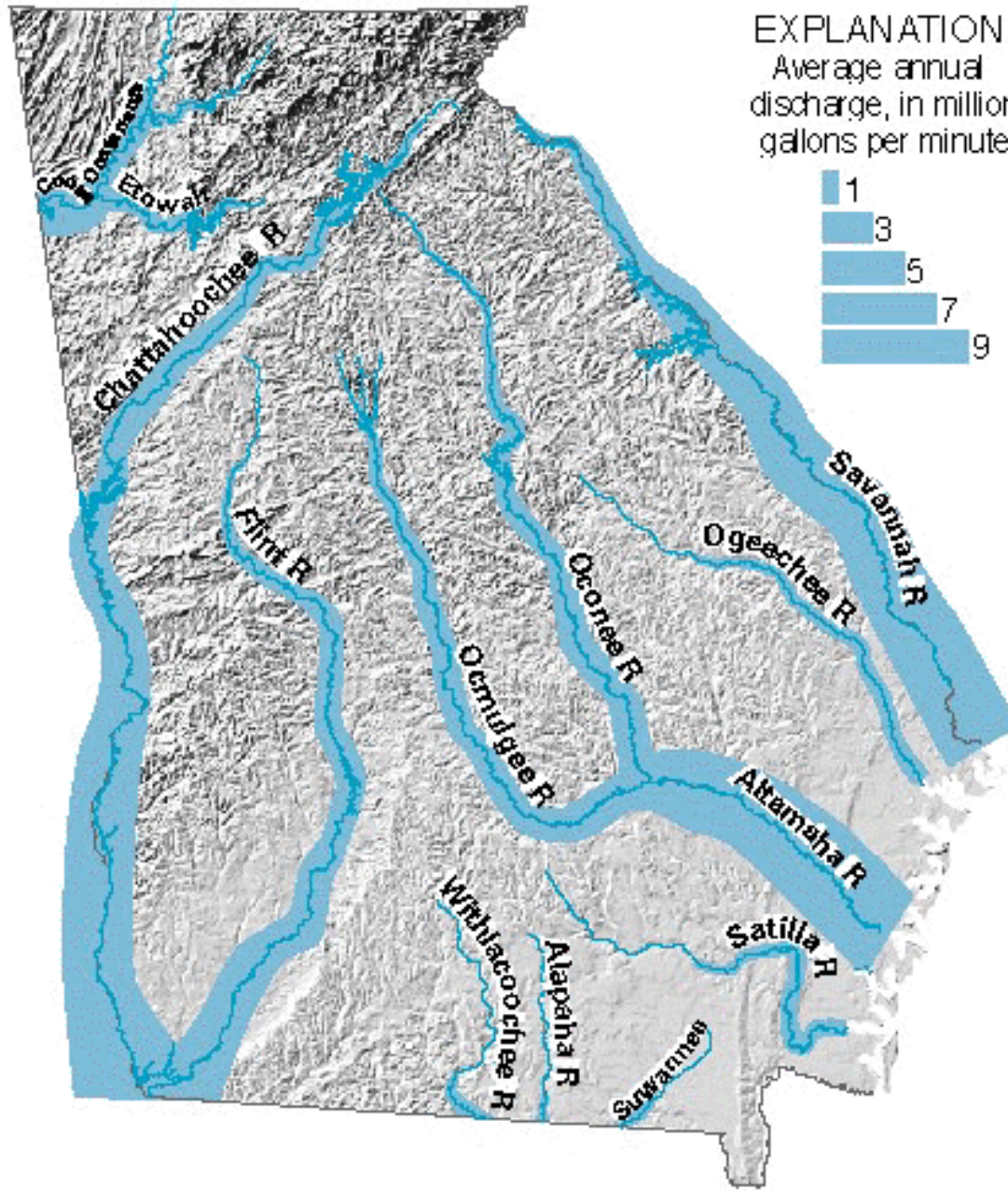




The Dynamic Equilibrium of The Coast



Sediment Supply - the Five Major Rivers of Georgia



Low tide

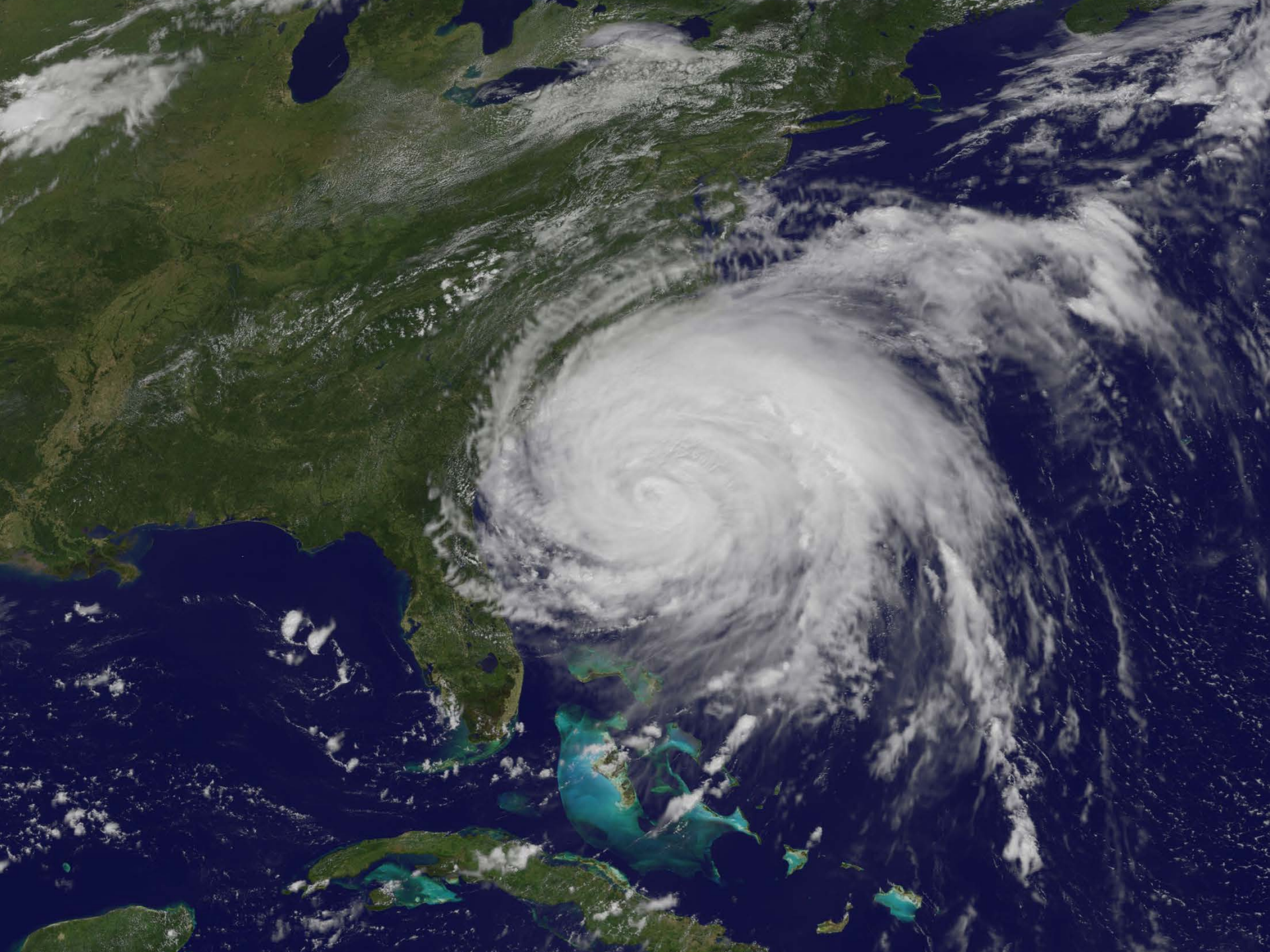
Jekyll Island, GA



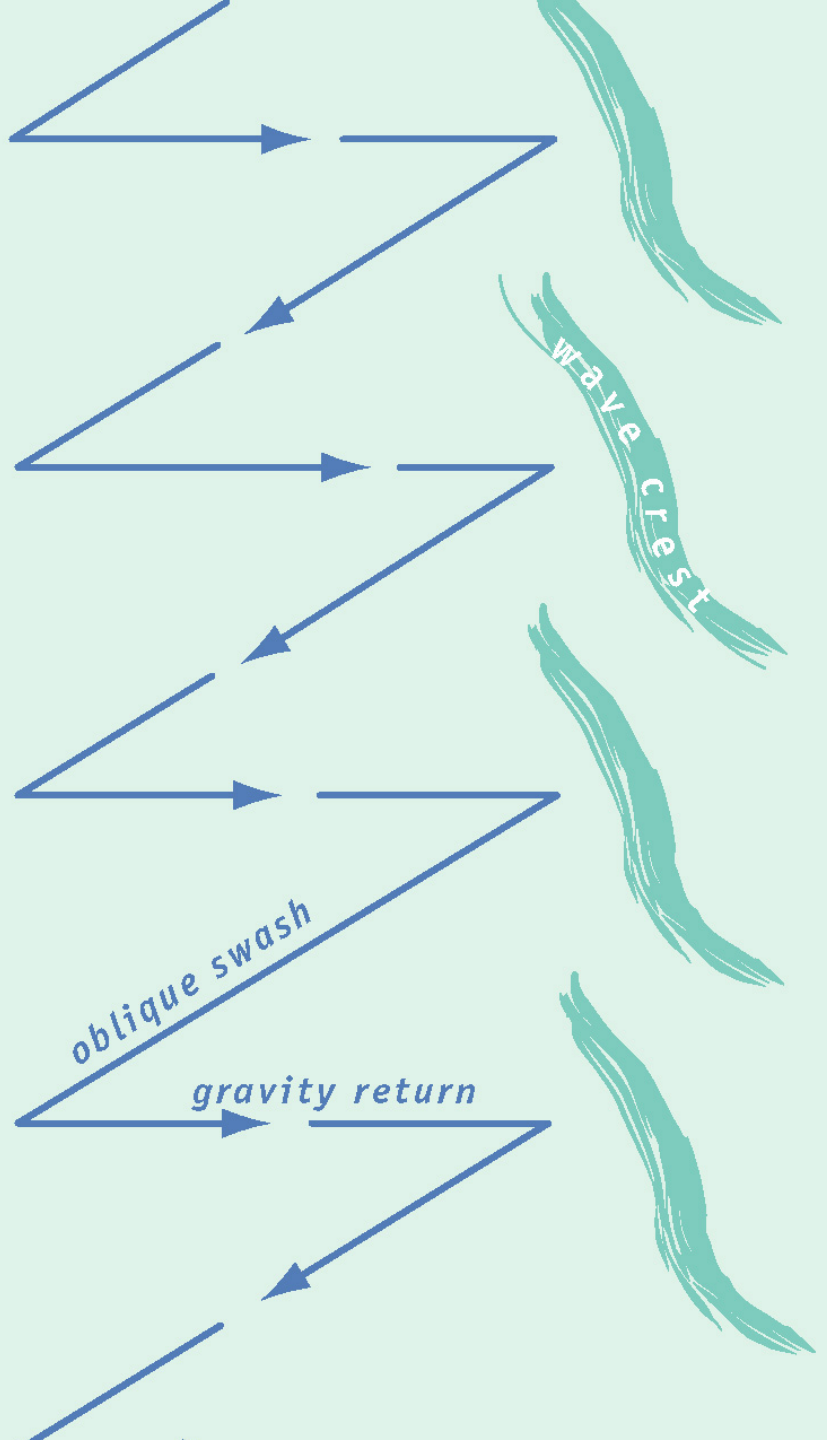
High tide



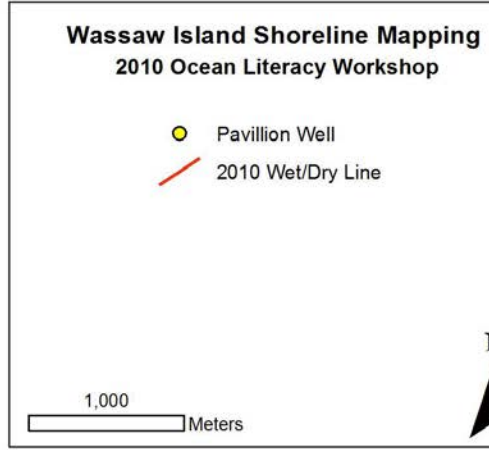
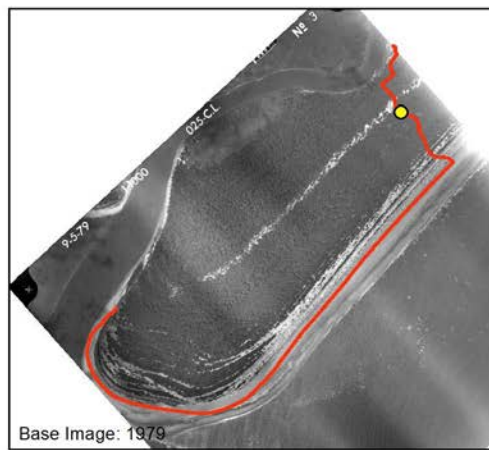
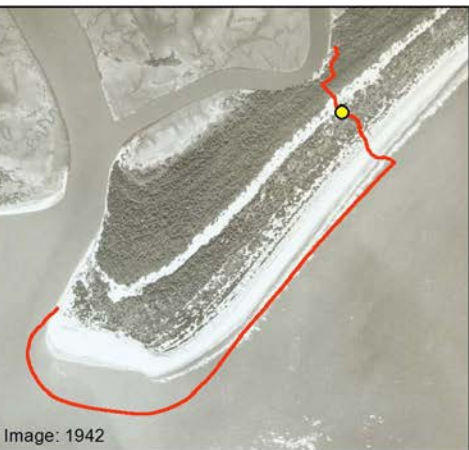
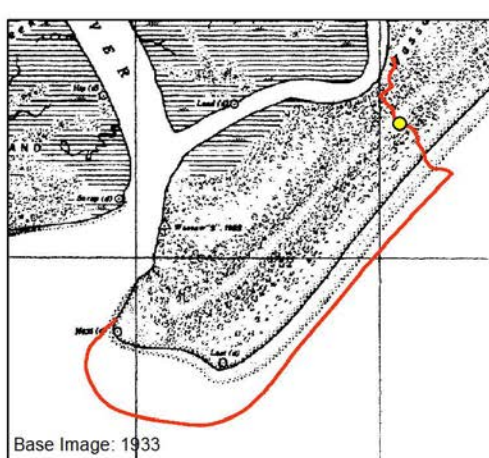
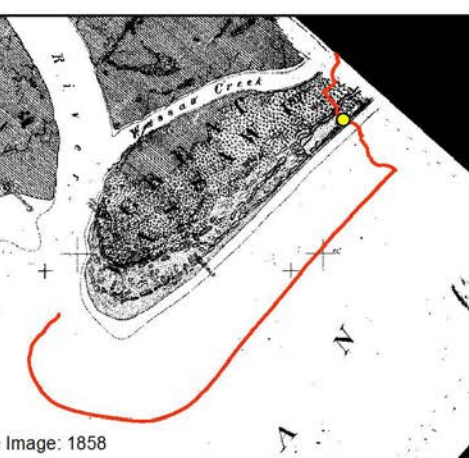
Isle of Hope, GA



shoreline

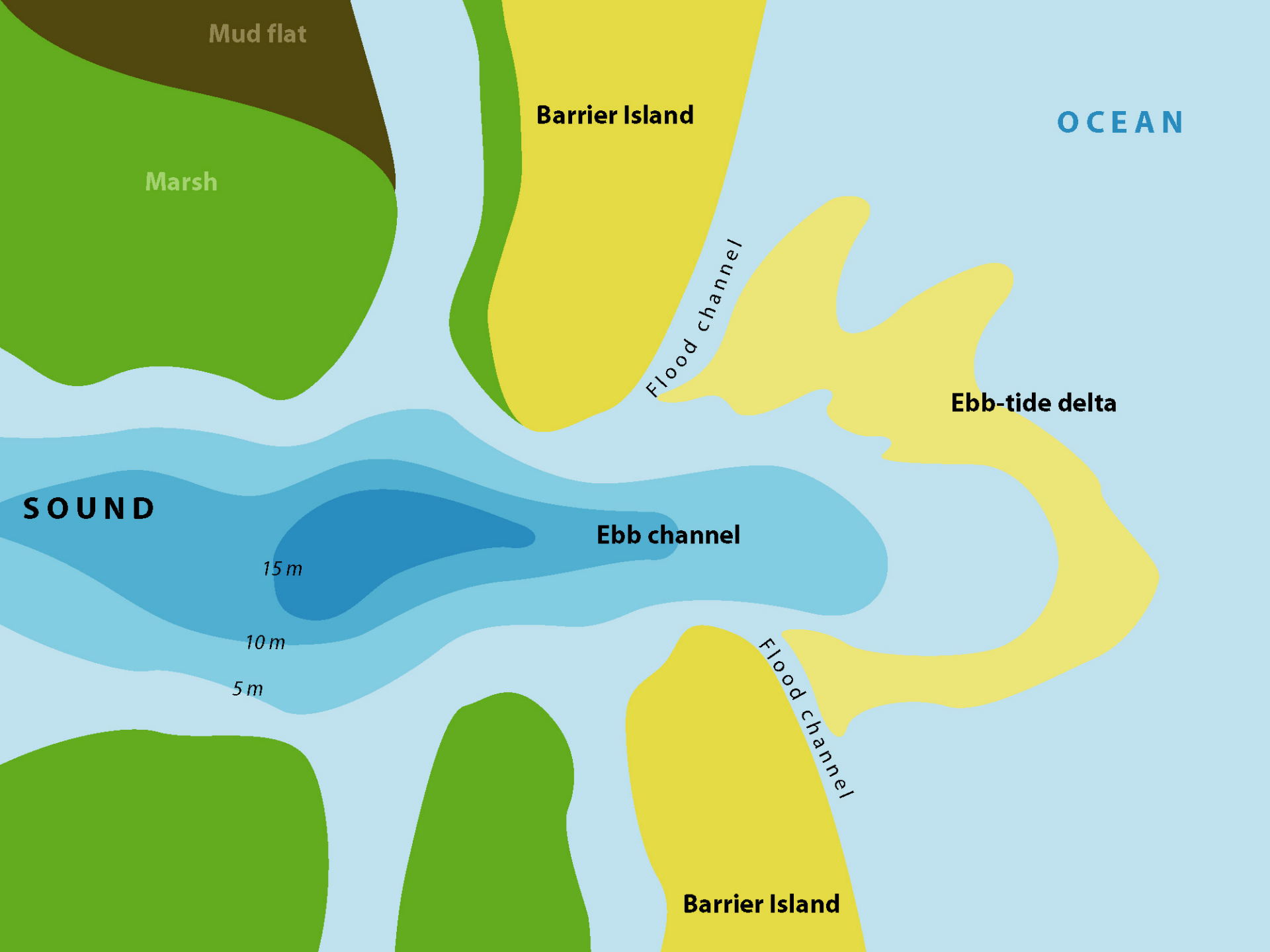


Wassaw Island



Chatham County, GA 2004 Imagery







North End Wassaw Island

1992



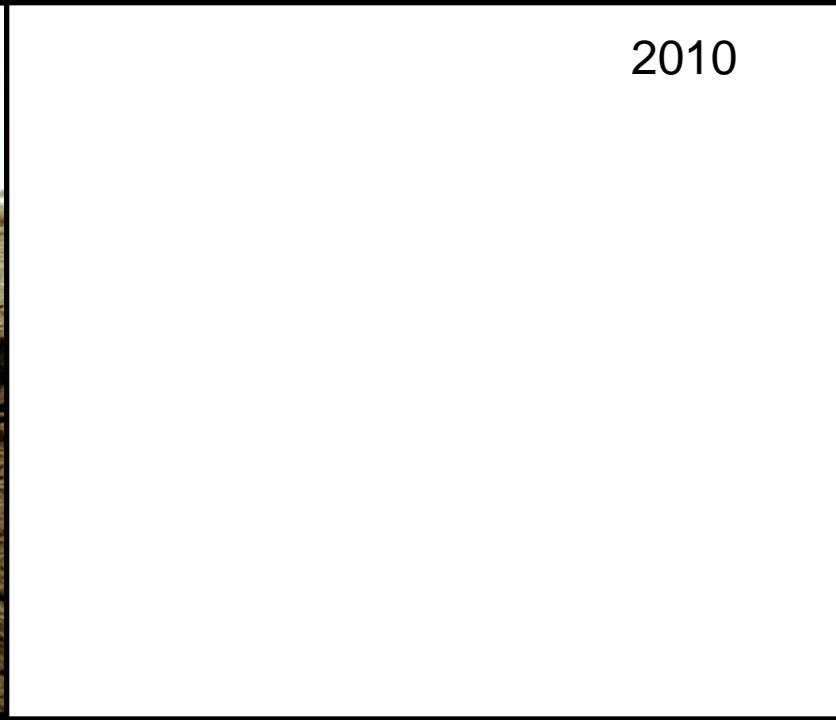
2003



1985

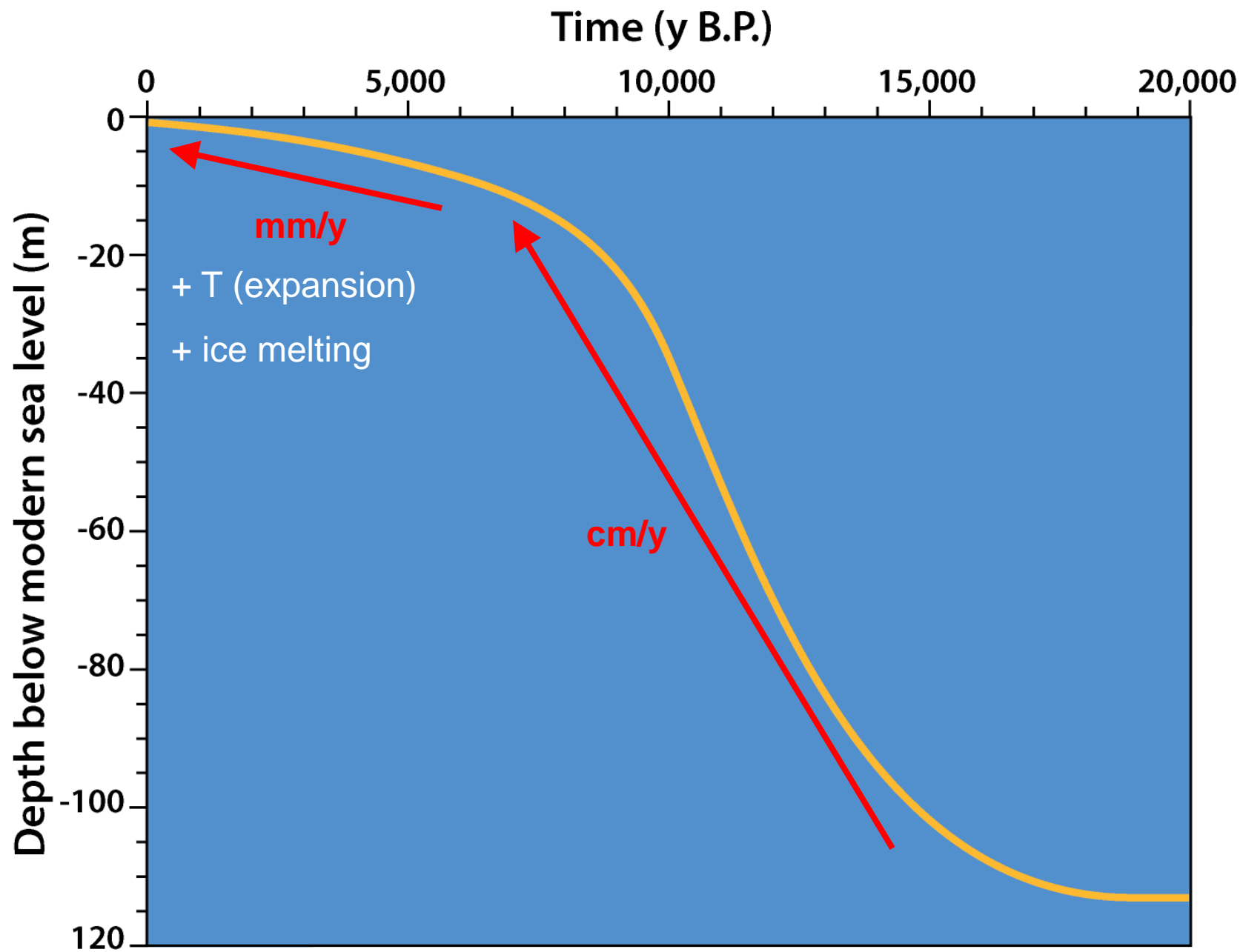


2010





Shoreline
~1970



Relative Rates of Sea Level Change

Local change = sum of global rise (+) and local factors (+/-)

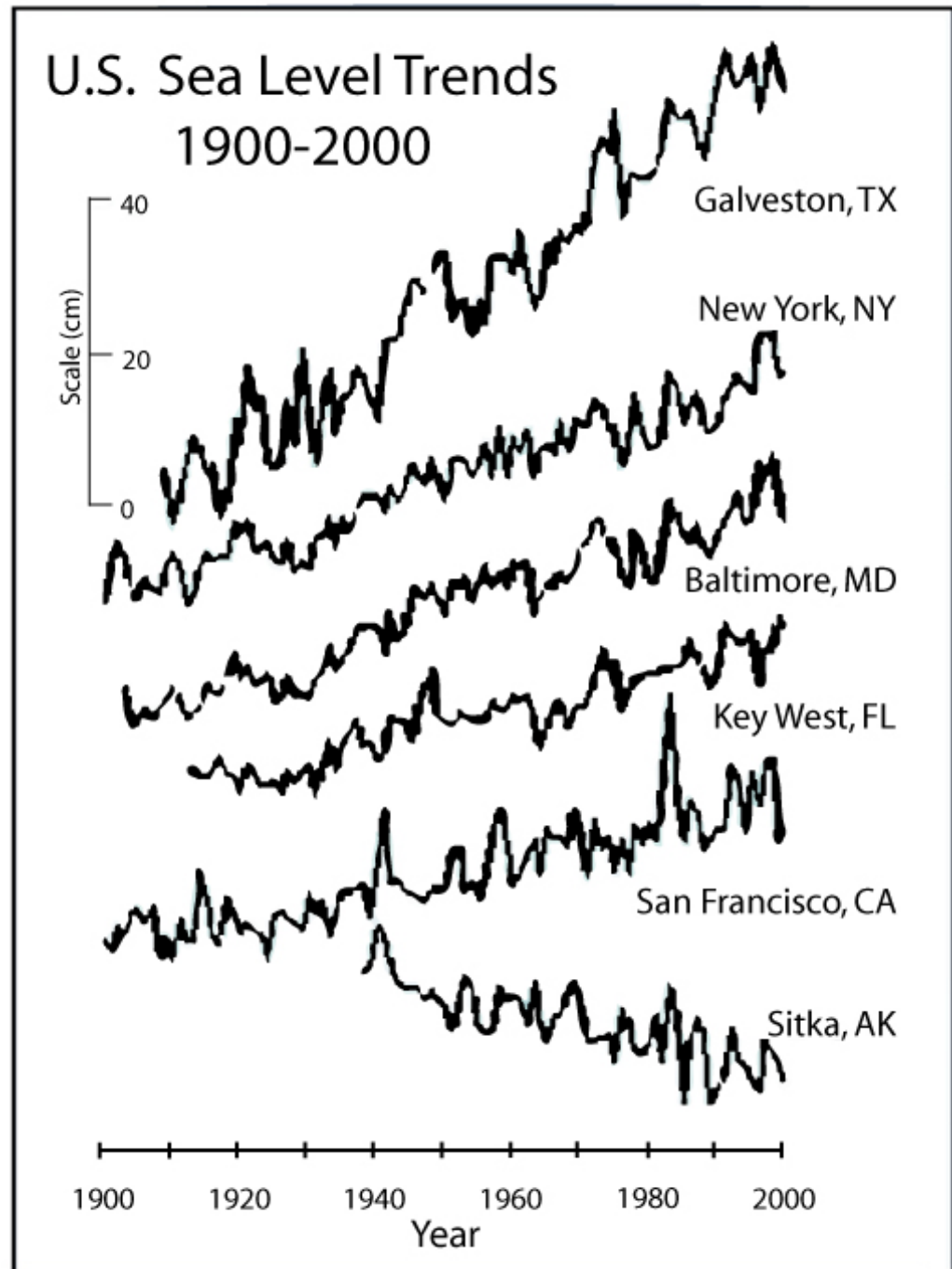
Local factors:

*** Human activities**

- groundwater use
- oil/gas extraction
- river channelization

*** Geologic processes**

- autocompaction
- active tectonics
- glacial rebound



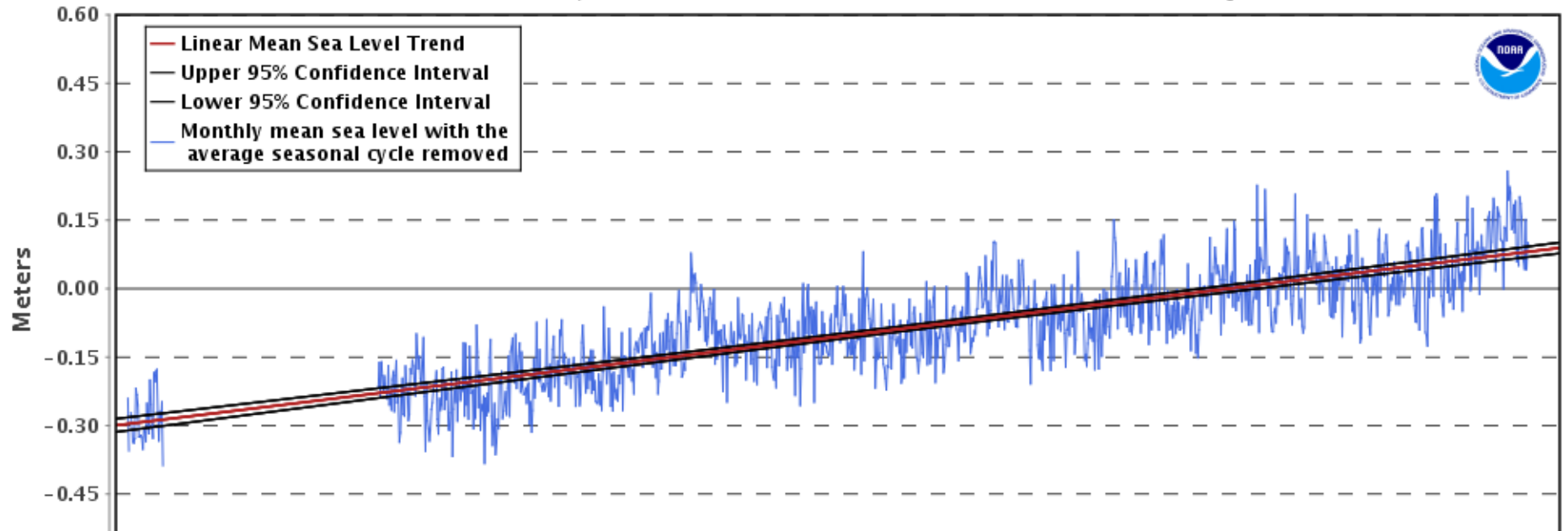


NOAA Sea Level Trends for North America



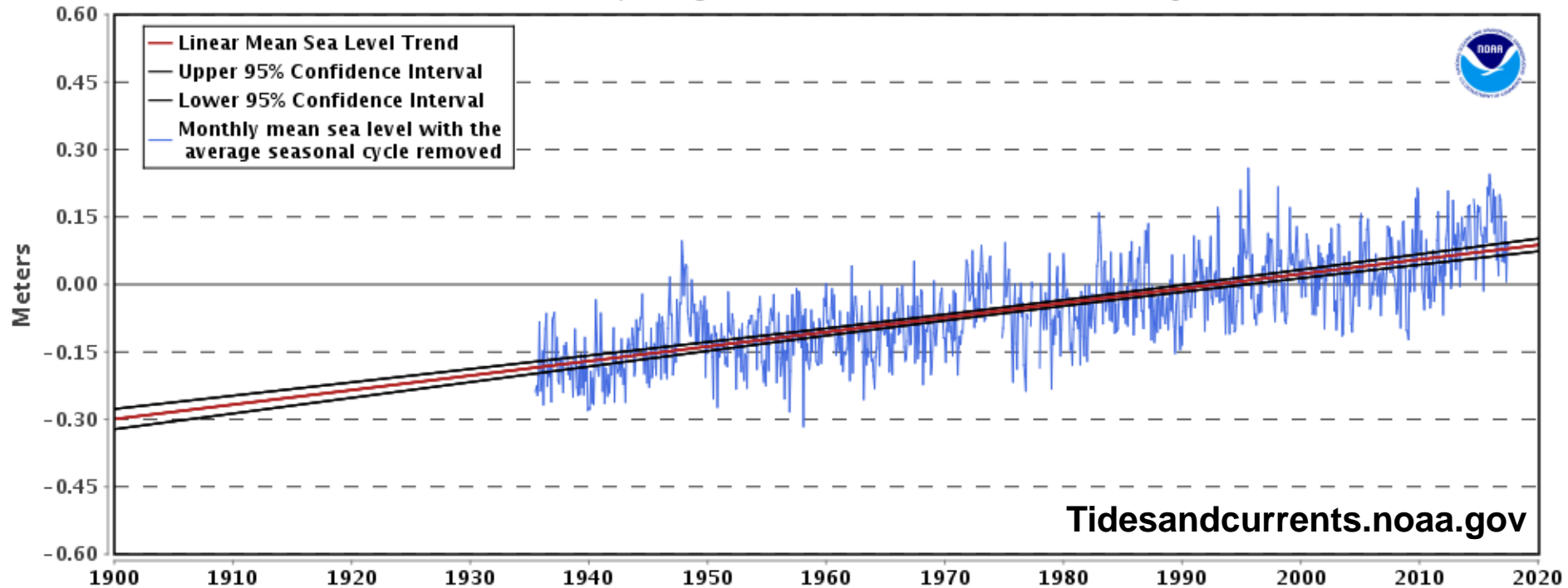
8665530 Charleston, South Carolina

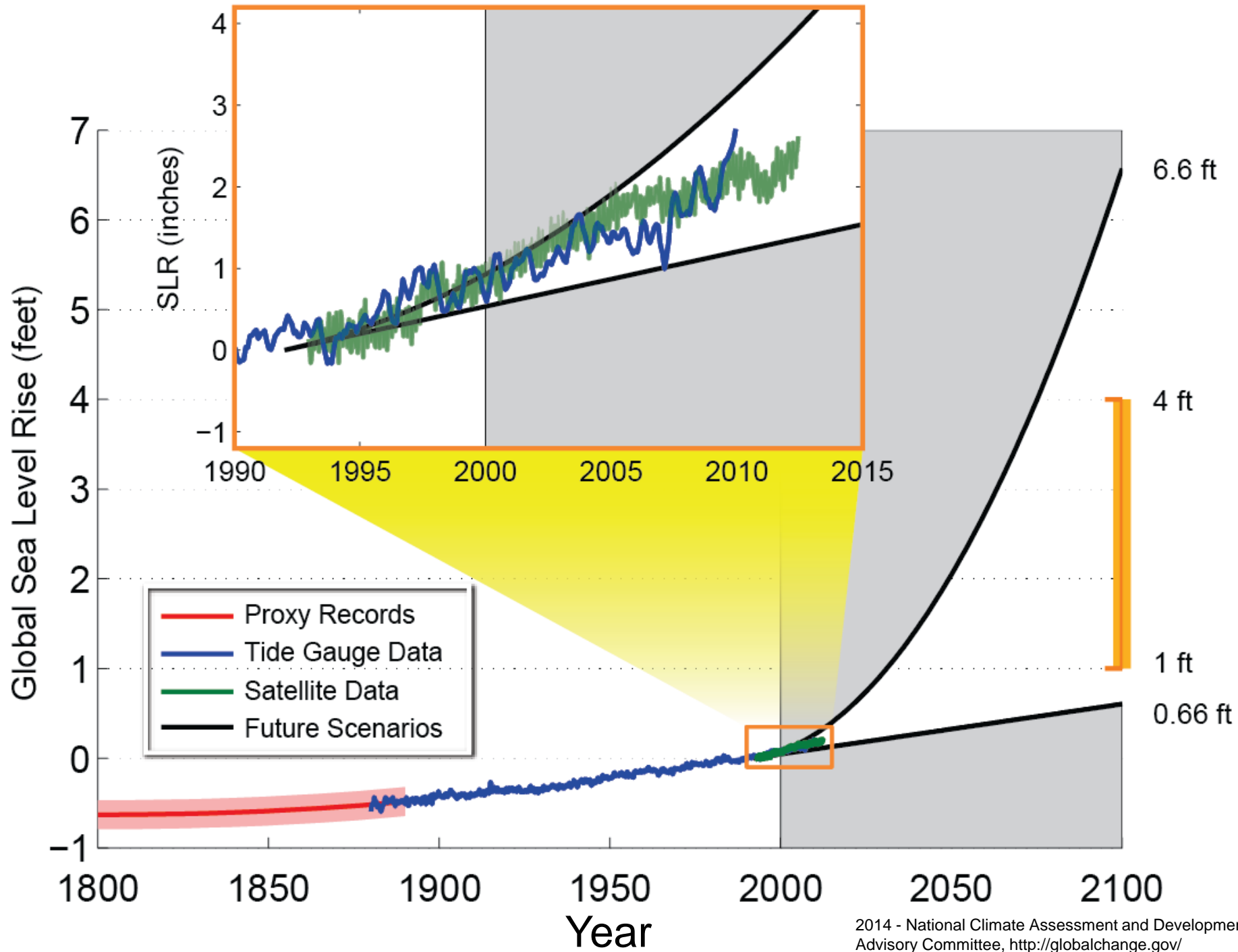
3.24 +/- 0.20 mm/yr



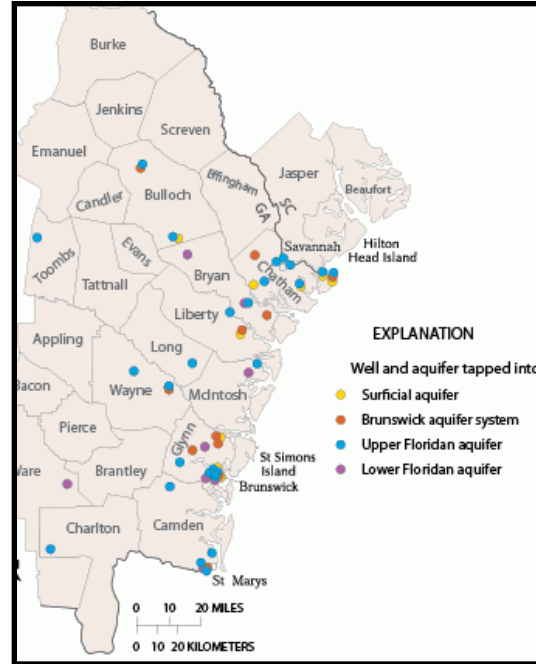
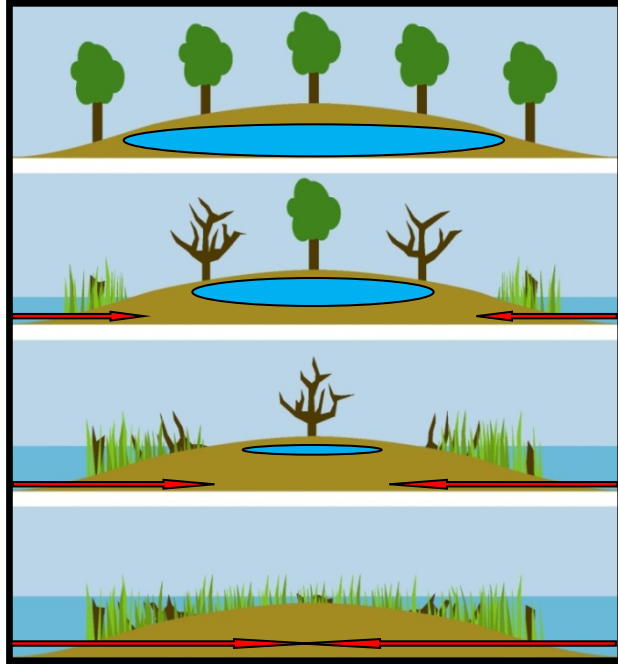
8670870 Fort Pulaski, Georgia

3.23 +/- 0.28 mm/yr





Major Consequences of Sea Level Rise



- saltwater intrusion
- loss of intertidal habitat
- less efficient drainage and septic systems
- increased shoreline erosion and retreat
- storm damage/more frequent flooding

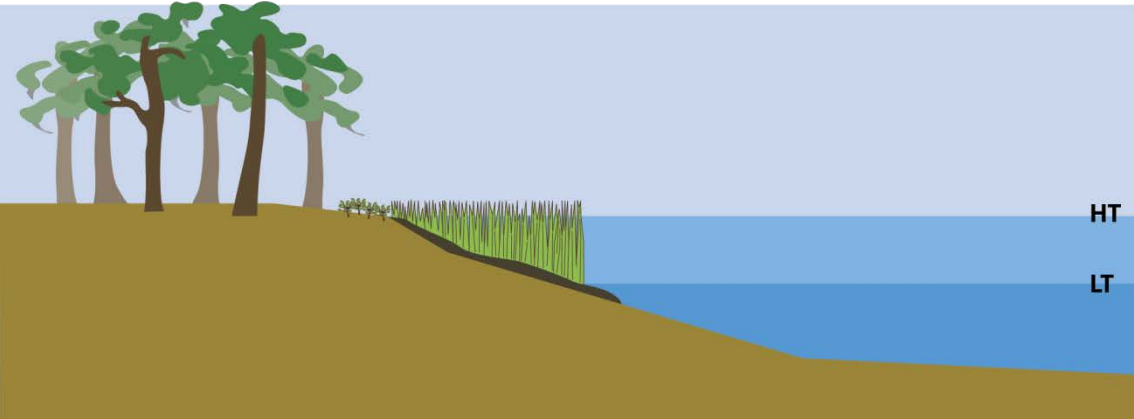
Rising Seas = Erosion and Retreating Shorelines



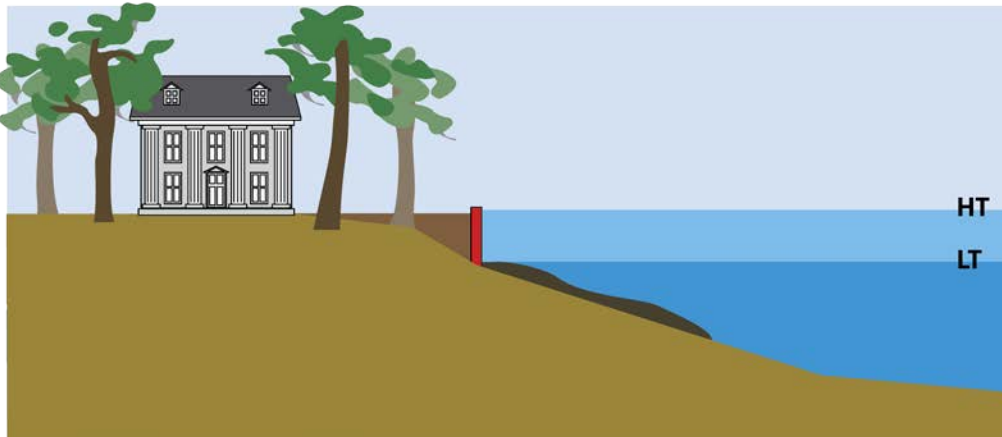
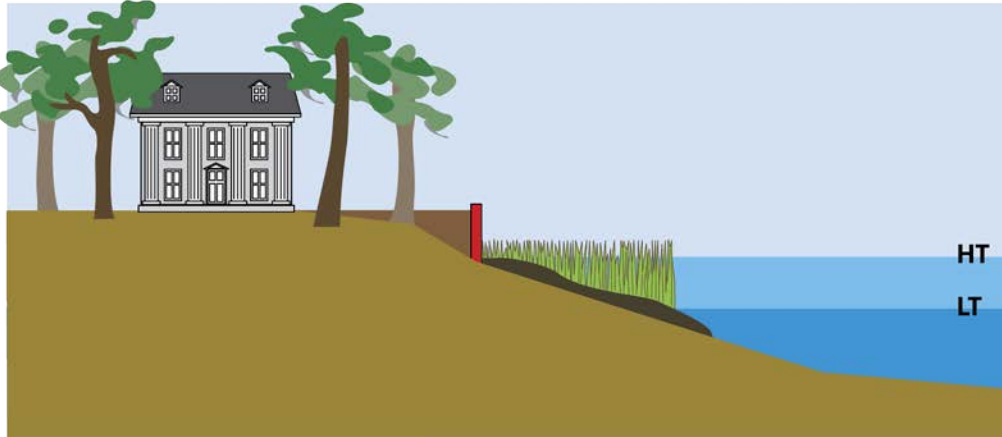
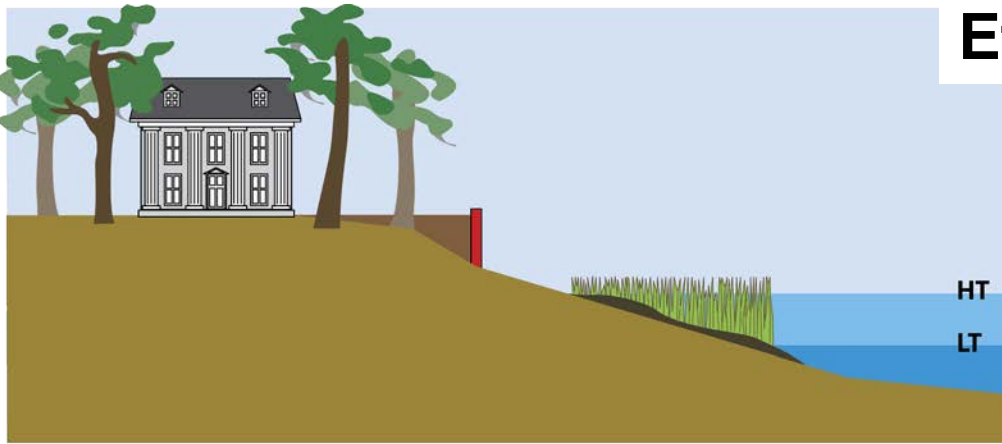




Natural Marsh Migration onto the Upland

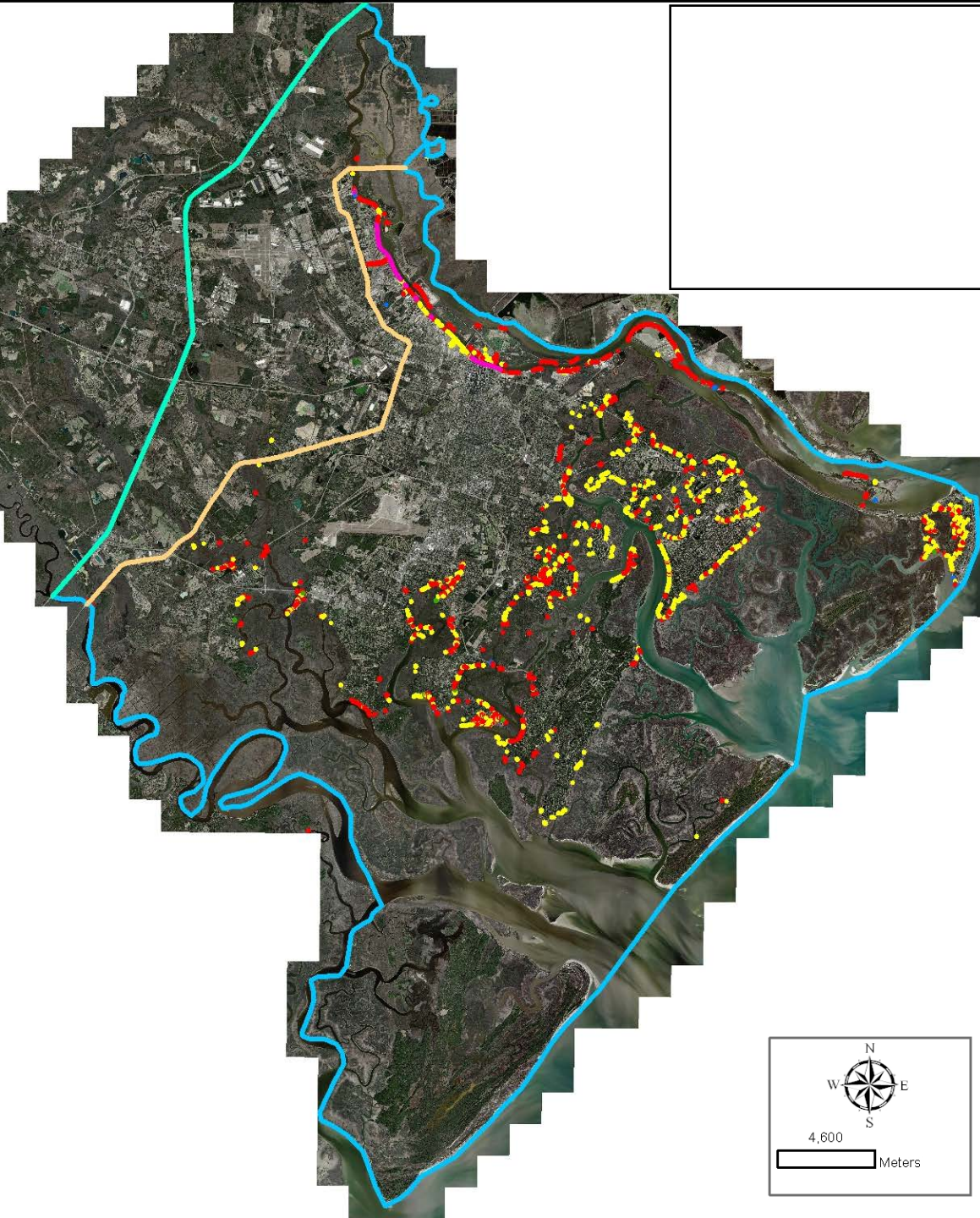


Effects of Shoreline Armoring

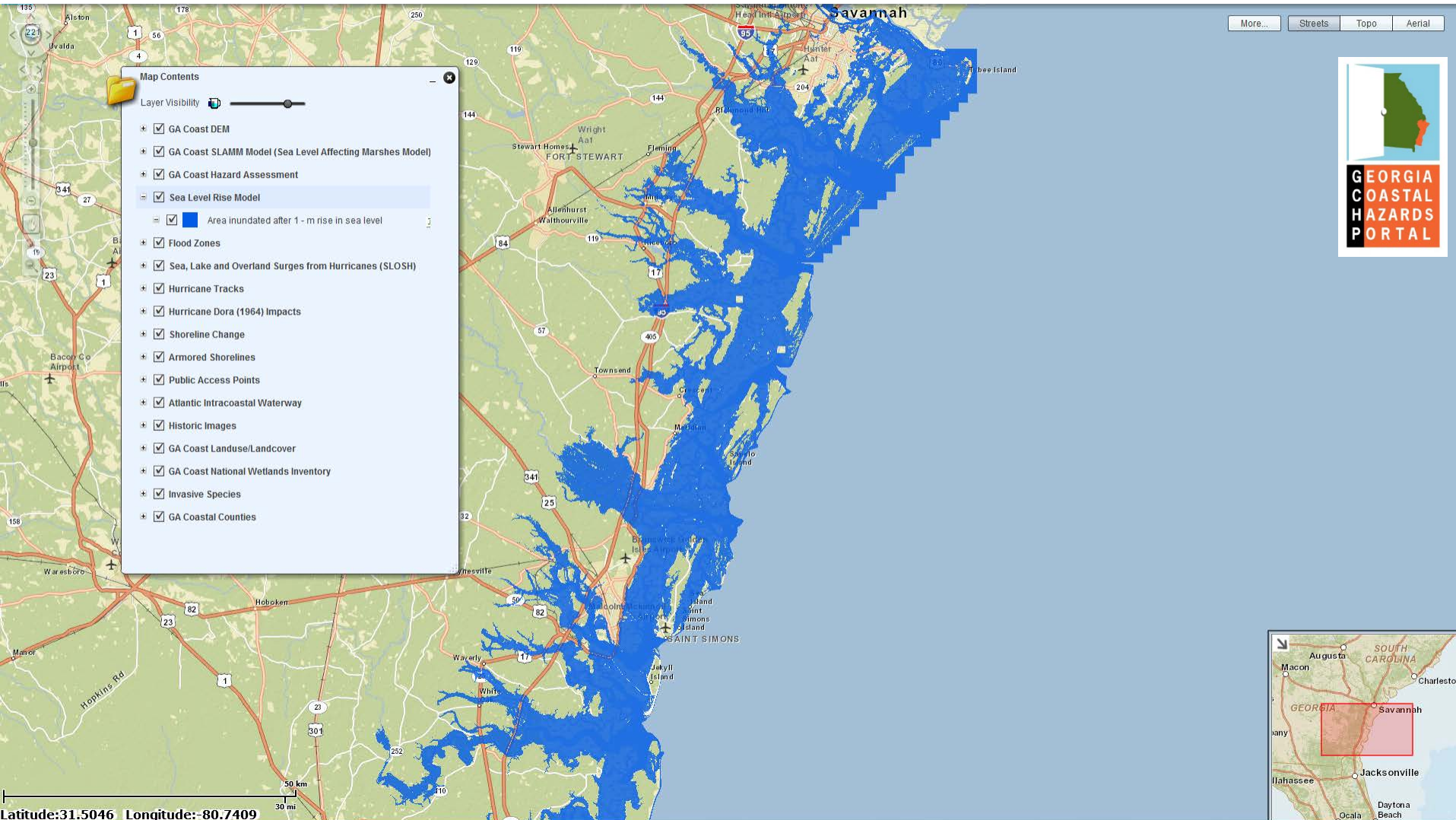


Armored Shorelines in Chatham County, Georgia

- Number of structures: 1,651
- Total armoring: 357,982 ft
- Bulkheads: 152,348 ft
- Revetments: 184,727 ft
- Both: 5,332 ft
- Causeways: 236,471 ft

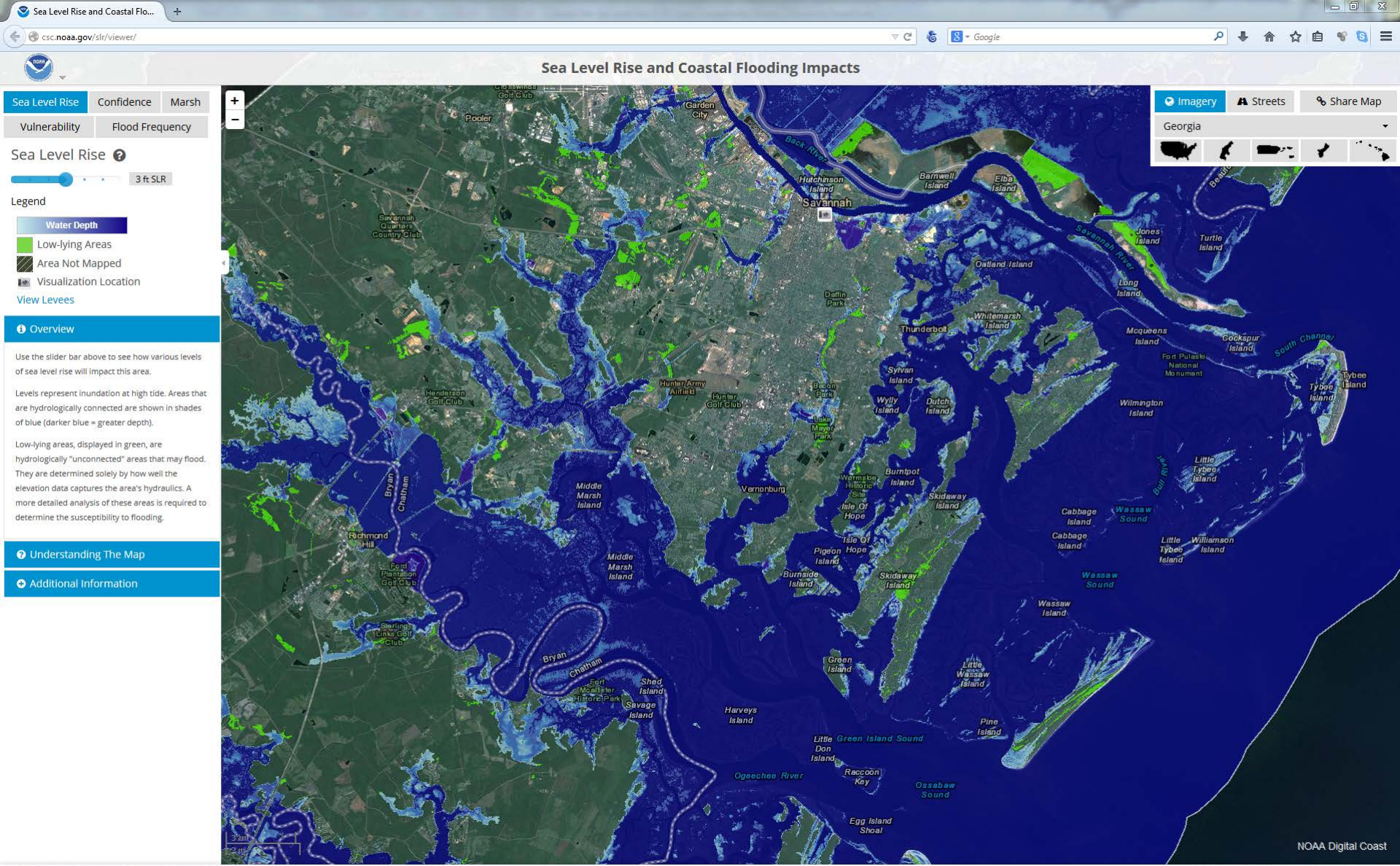


How Can I Visualize Sea Level Rise?



Georgia Coastal Hazards Portal (gchp.skiو.uga.edu)

coastal hazards and vulnerability assessments – multiple sea level rise models – storm hazard and flood zones - marsh migration (SLAMM) – shoreline change - hurricanes



NOAA Digital Coast (csc.noaa.gov/slr/viewer)

Sea level rise – marsh migration (SLAMM) – flood frequency - vulnerability



Questions?