

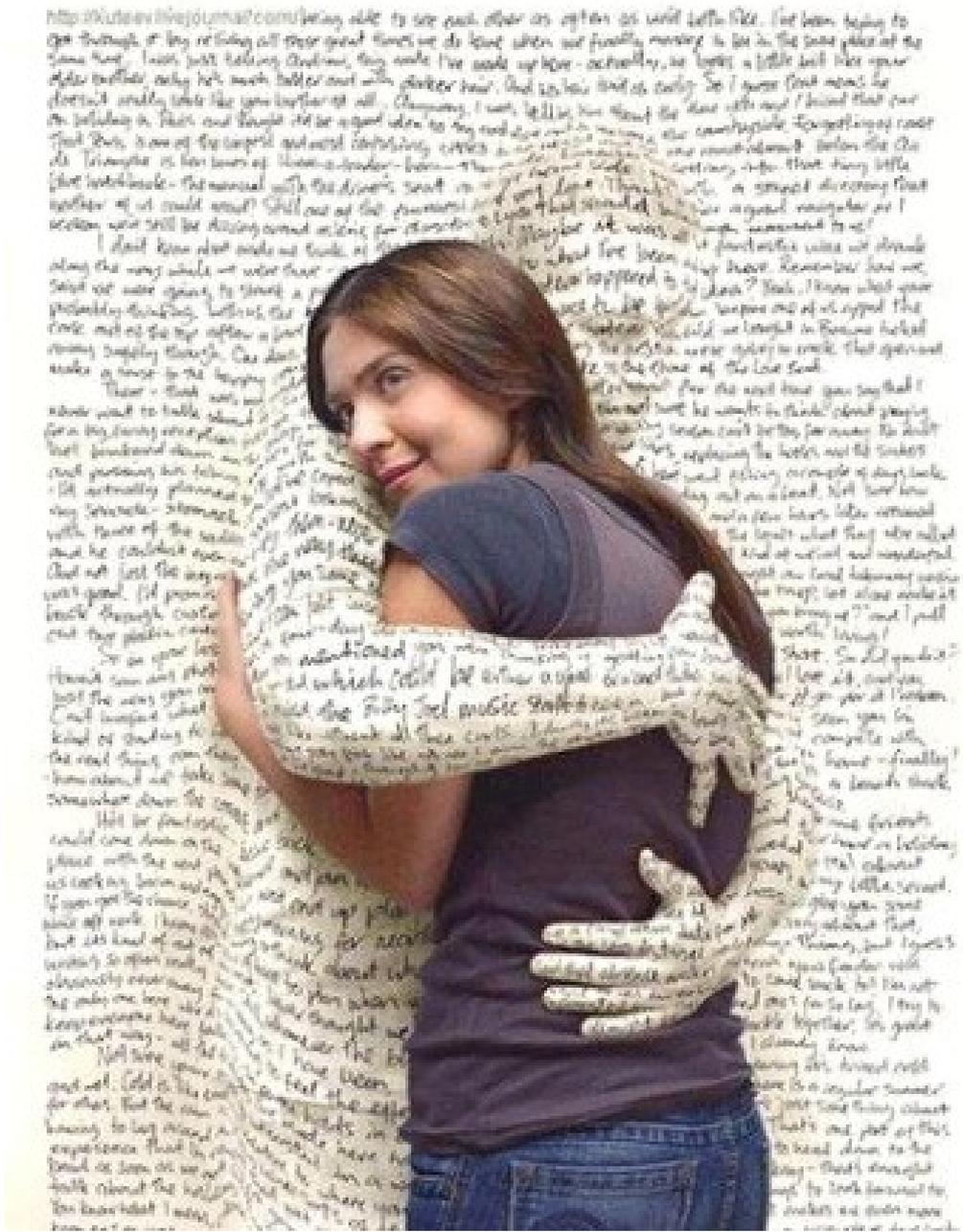
Sea Level Rise – The Past, the Present, and the Future



Dr. Clark Alexander

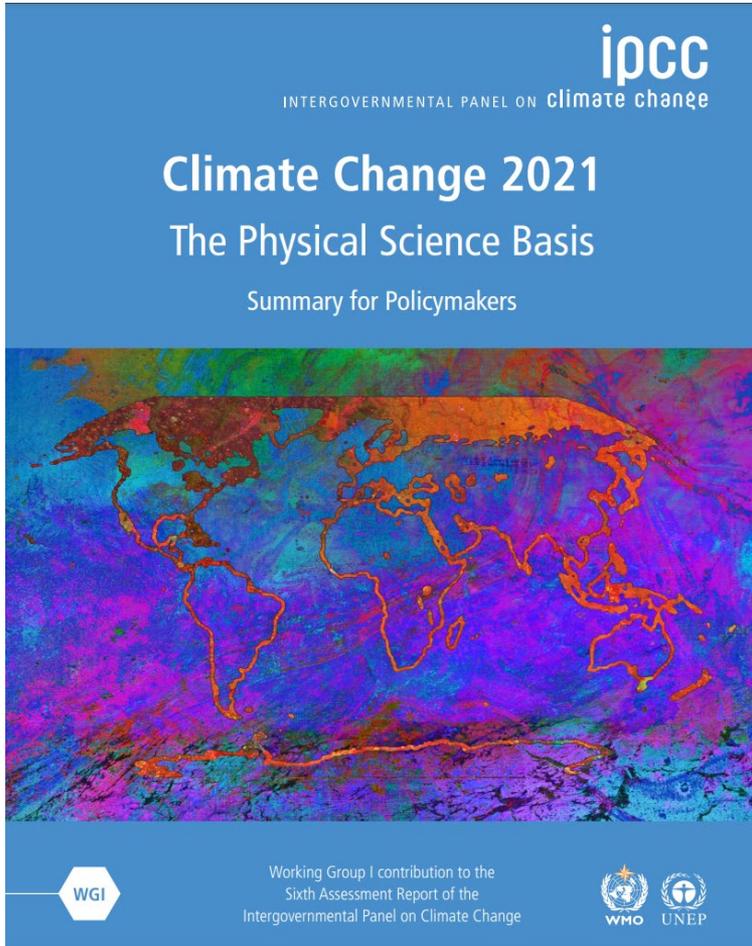


Skidaway Institute
of Oceanography
UNIVERSITY OF GEORGIA



EMBRACE THE DATA!

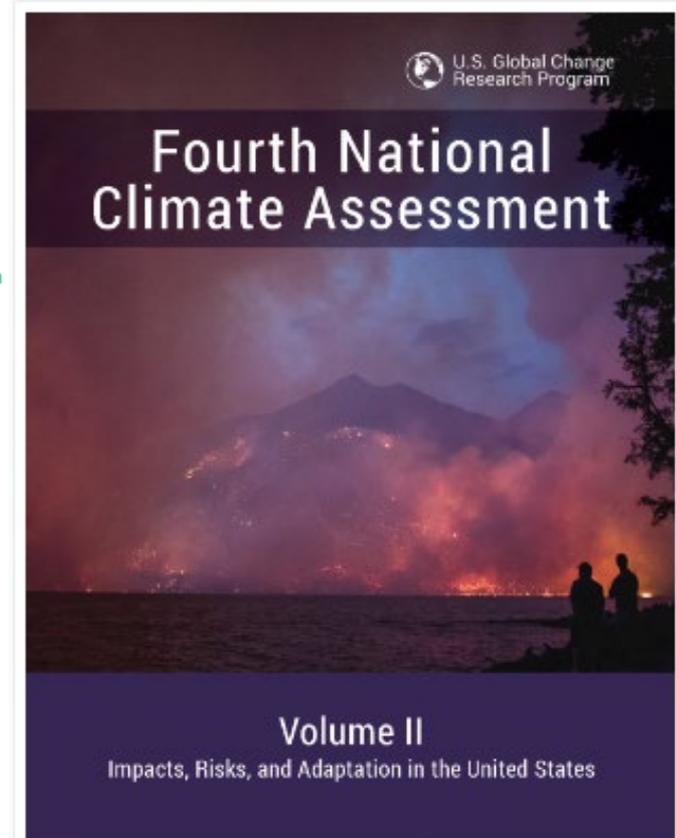
The Intergovernmental Panel on Climate Change (IPCC)



<https://www.ipcc.ch/report/ar6/>

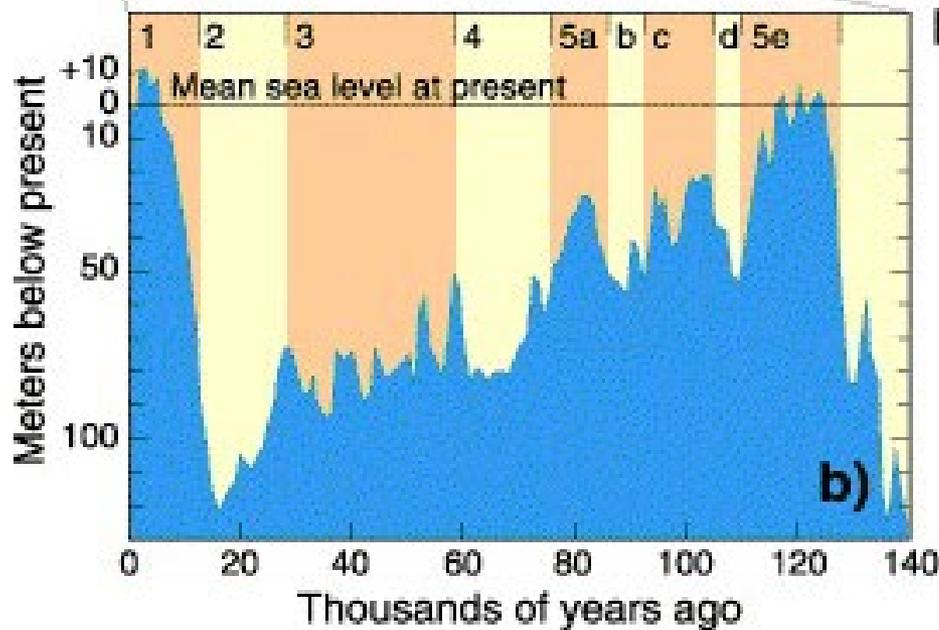
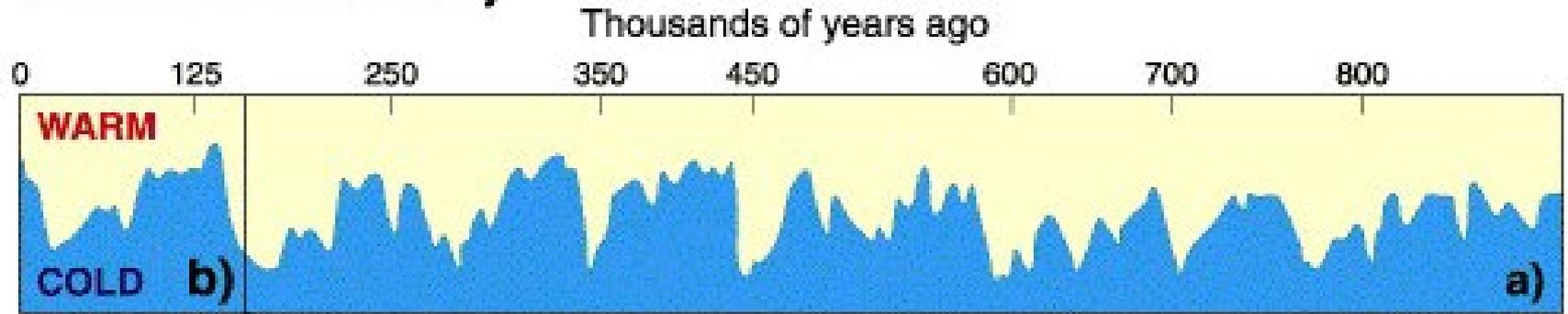
US National Climate Assessment

-  Department of Agriculture
-  Department of Commerce
-  Department of Defense
-  Department of Energy
-  Department of Health and Human Services
-  Department of the Interior
-  Department of State
-  Department of Transportation
-  Environmental Protection Agency
-  National Aeronautics & Space Administration
-  National Science Foundation
-  Smithsonian Institution
-  U.S. Agency for International Development



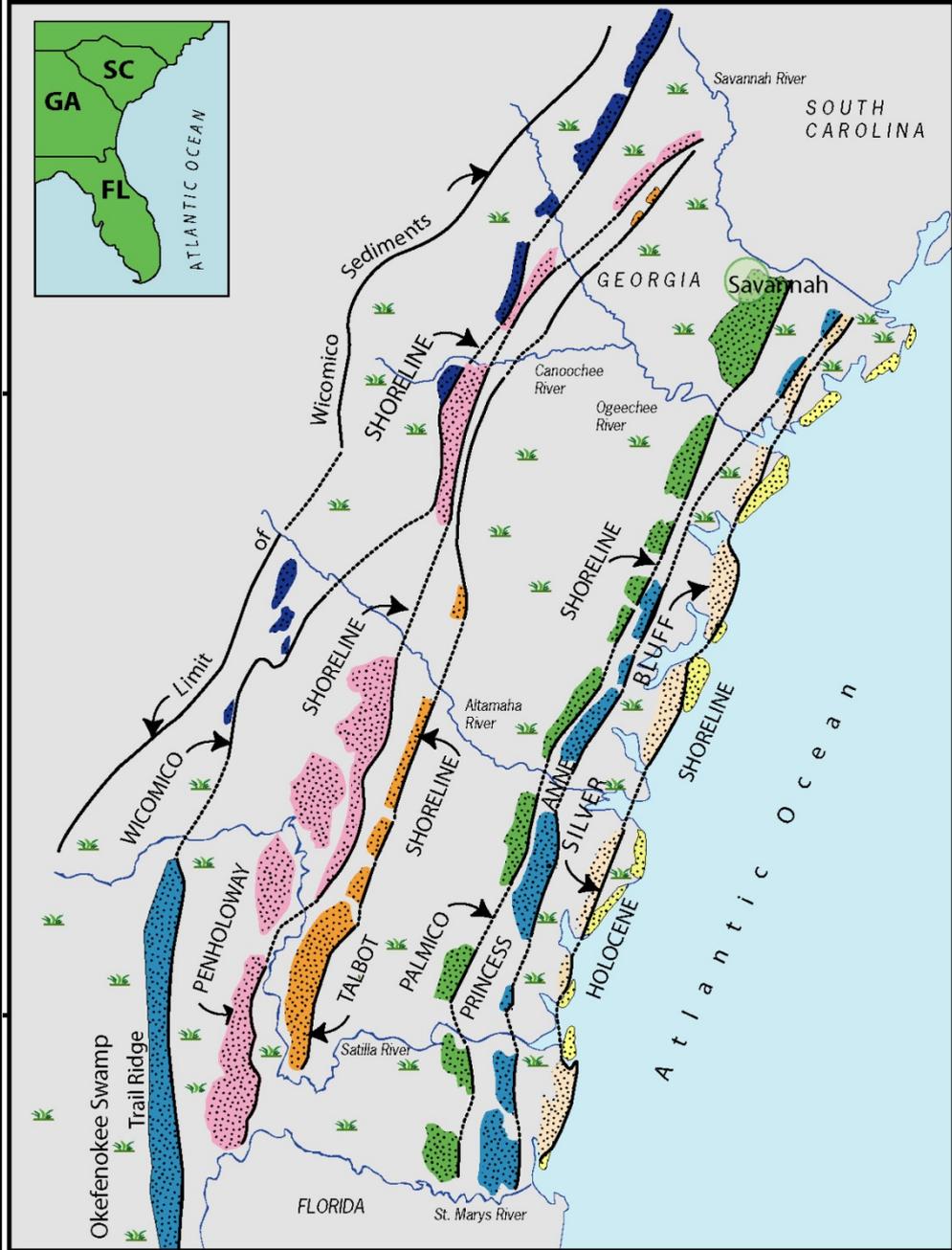
<https://science2017.globalchange.gov/>

a. Global climate history



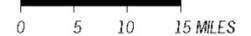
b. Late Quaternary sea-level history

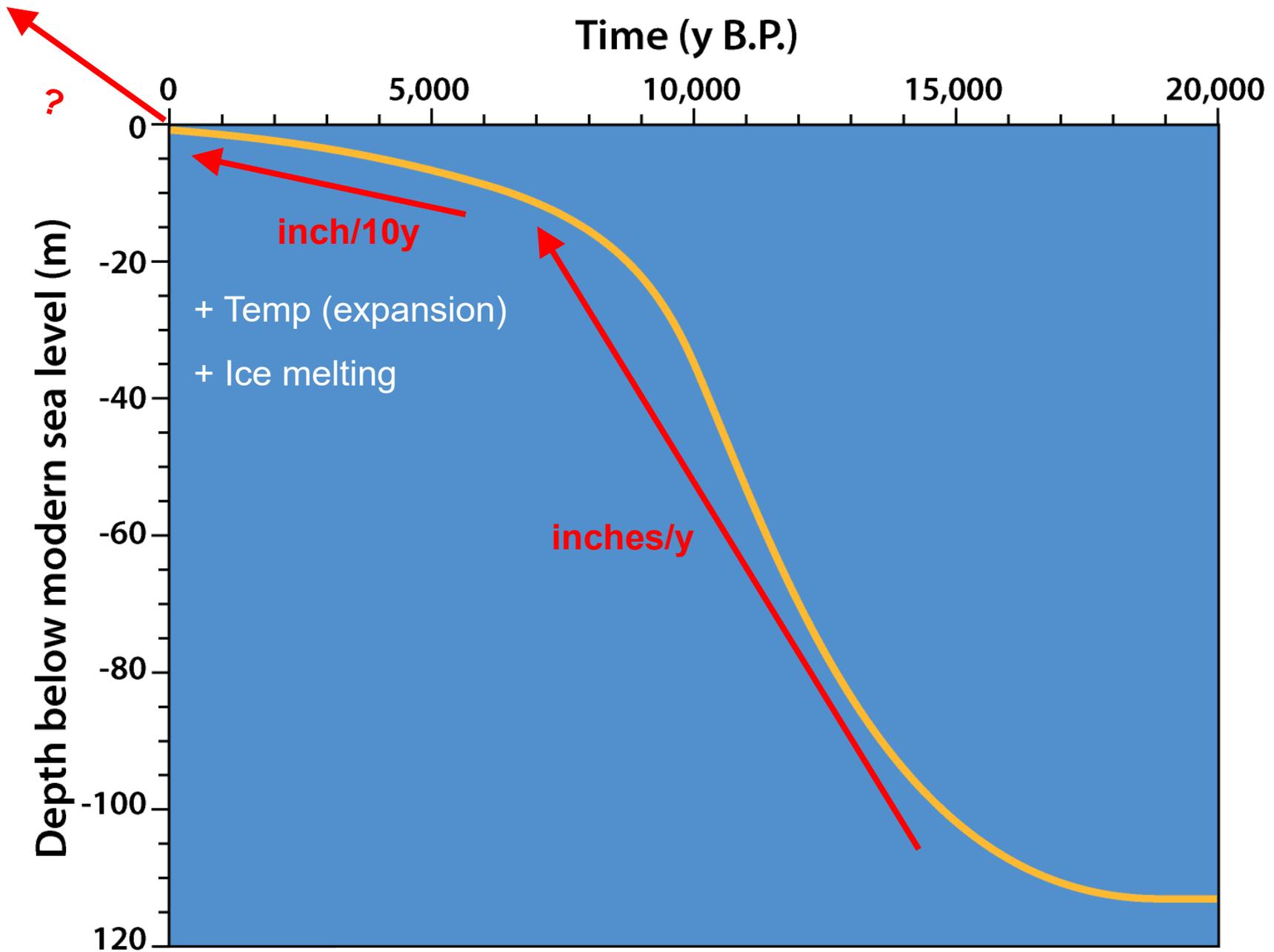
Sea Level History: The Long View



 Barrier Island Sediments

 Back Barrier Sediments





Relative Rates of Sea Level Change

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

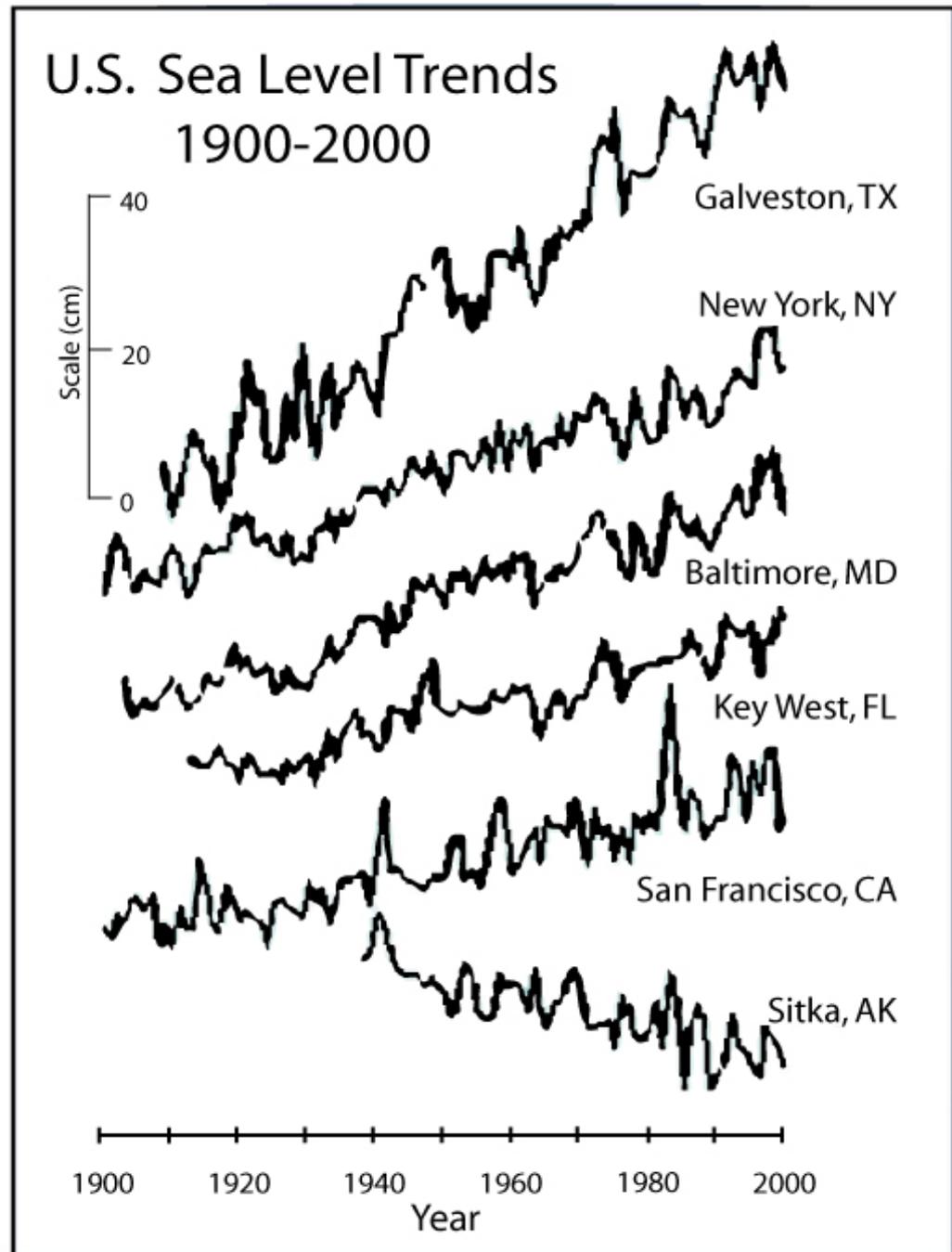
Local factors:

*** Human activities**

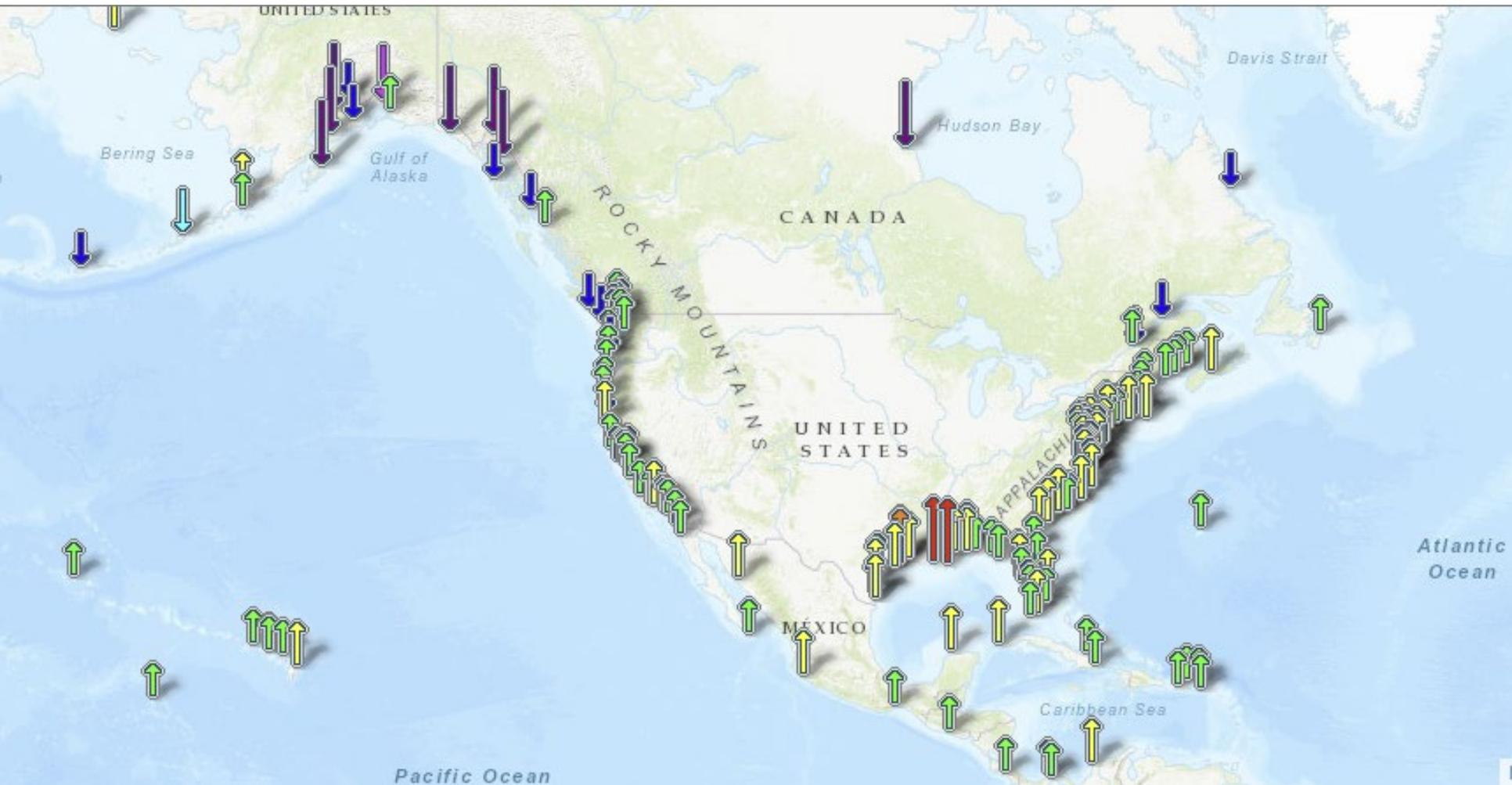
- groundwater use
- oil/gas extraction
- river channelization

*** Geologic processes**

- autocompaction
- active tectonics
- glacial rebound

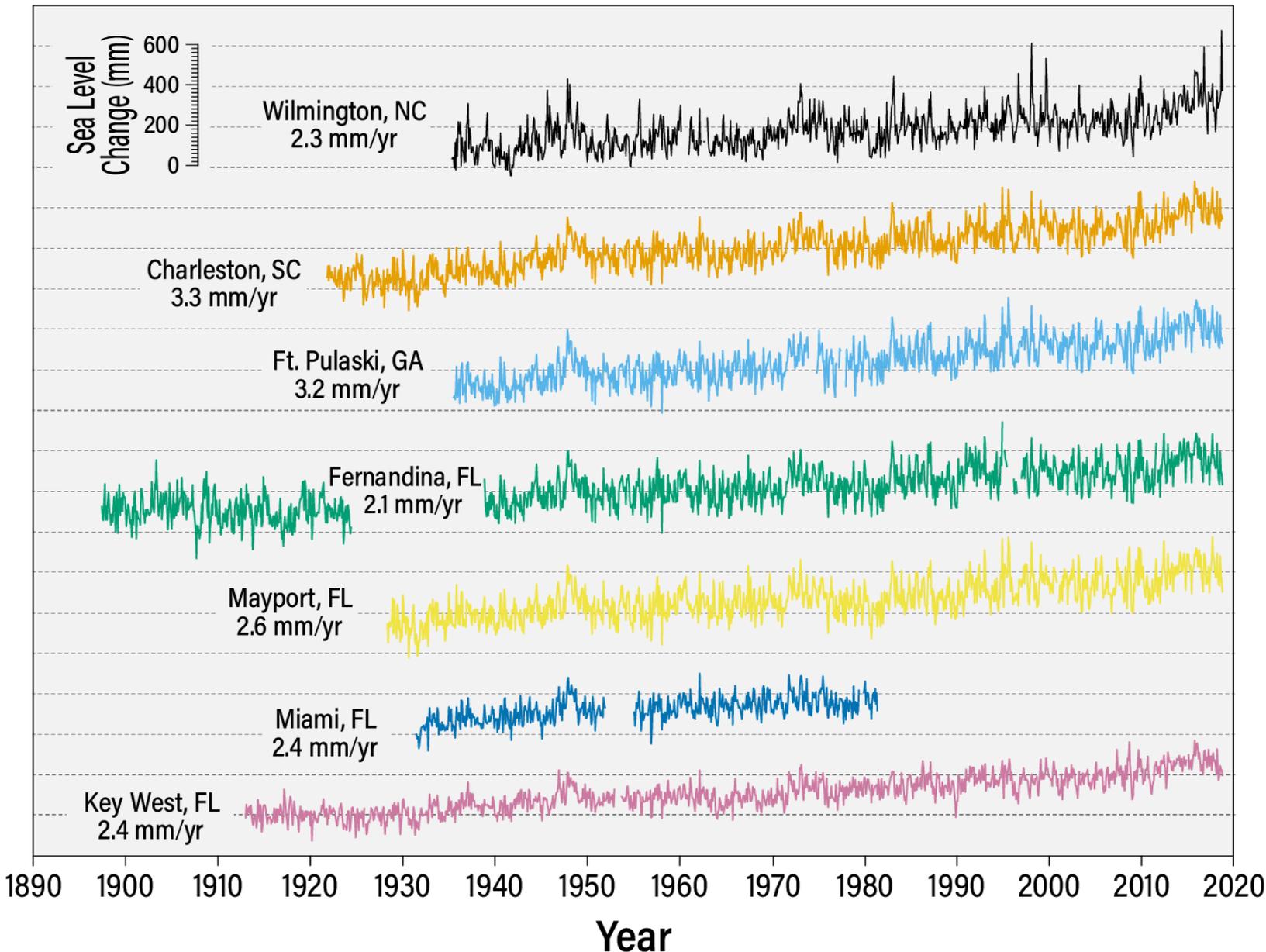


Sea Level Rise



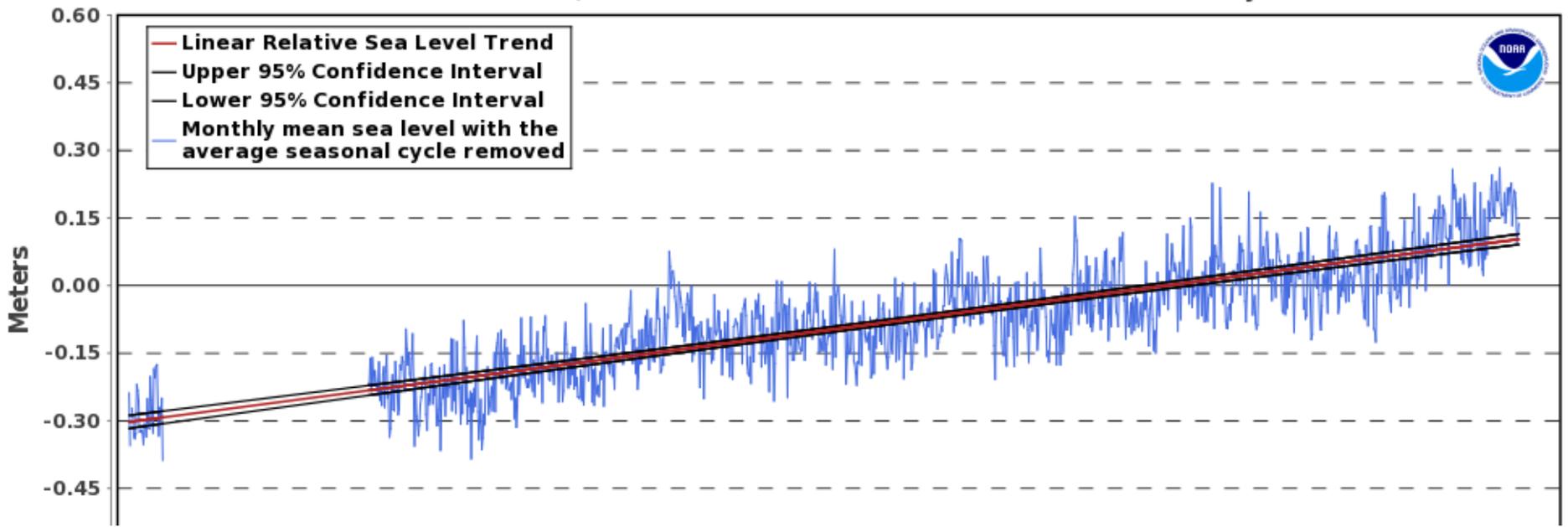
Measured at the coast with tide gauges – and from space with satellites!

Recent Sea Level Trends (NOAA)



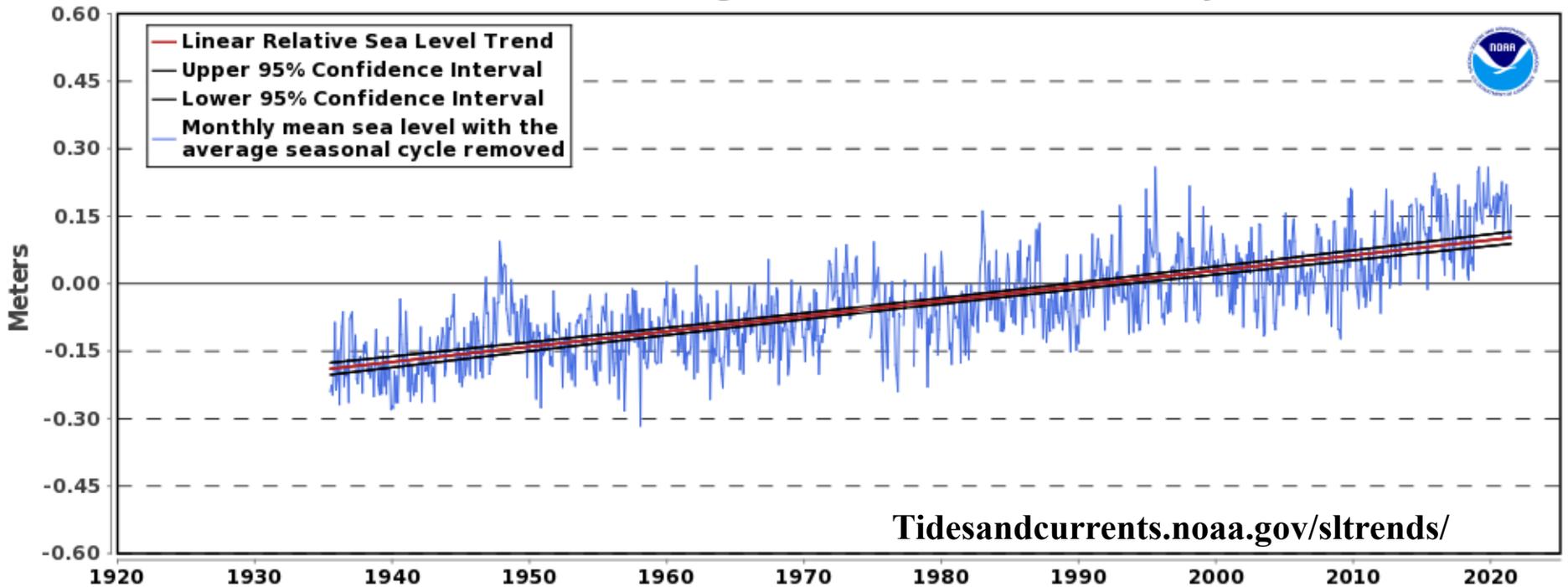
8665530 Charleston, South Carolina

3.36 +/- 0.19 mm/yr

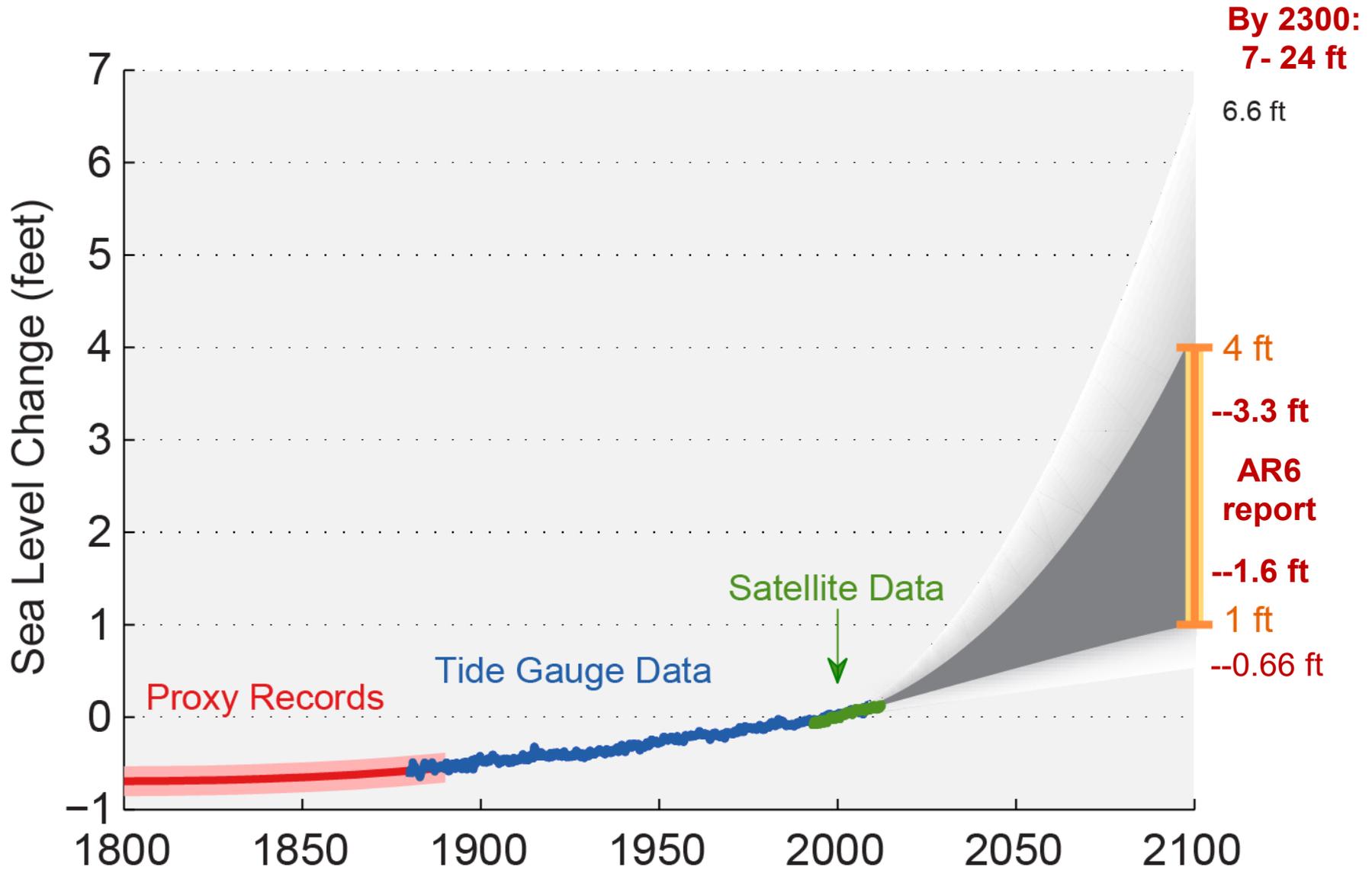


8670870 Fort Pulaski, Georgia

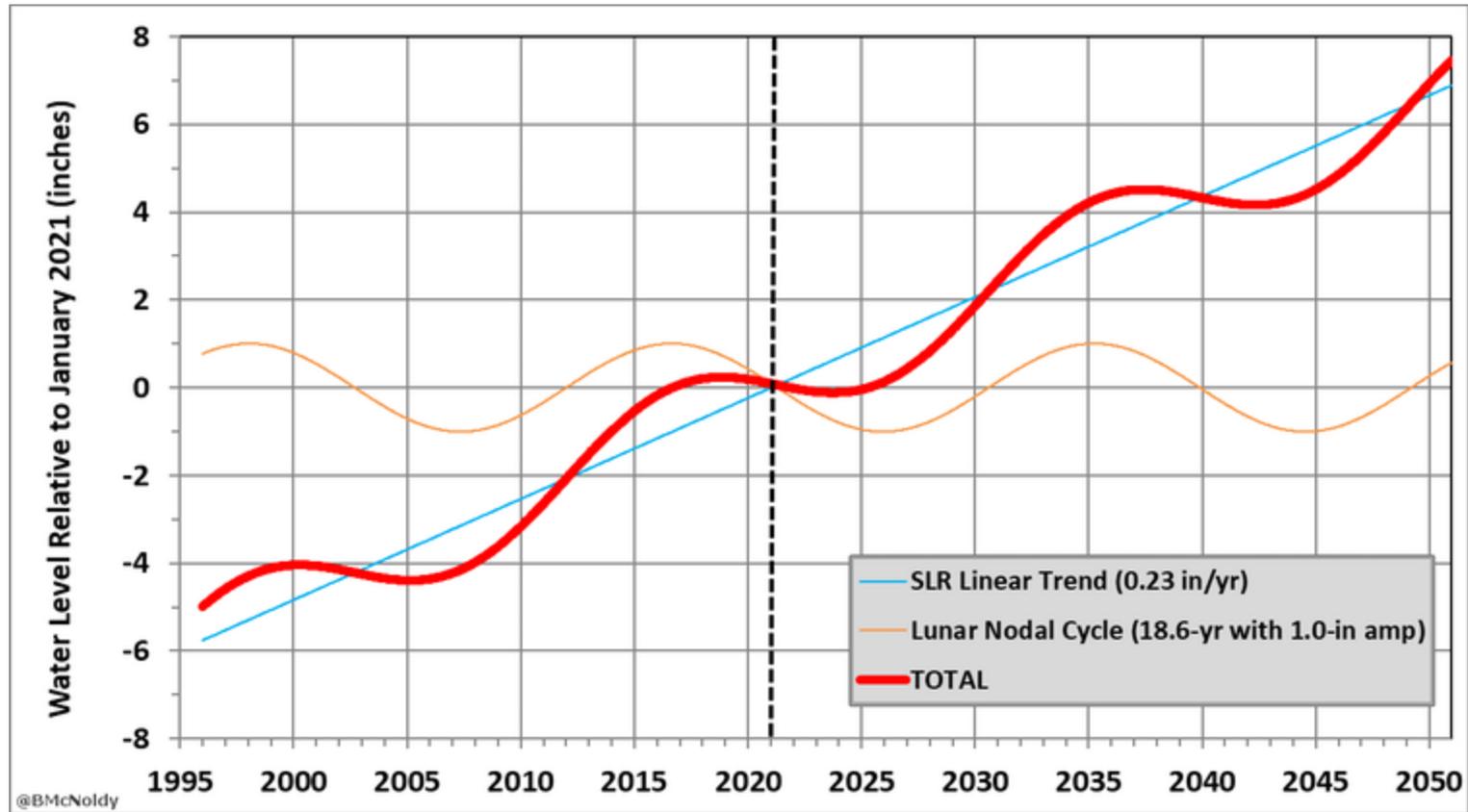
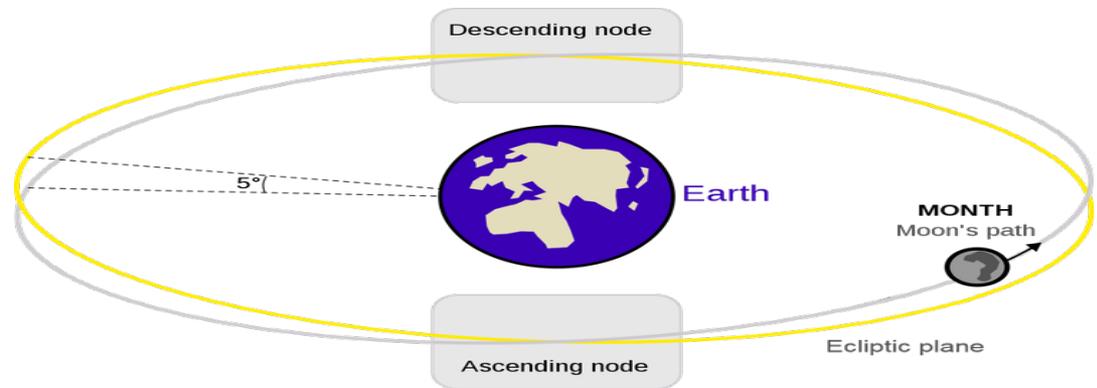
3.39 +/- 0.27 mm/yr



Past and Projected Changes in Global Sea Level



The 18.6-year Lunar Nodal Cycle



@BMcNoldy

Dr. Brian McNoldy, University of Miami

<https://theconversation.com/this-supermoon-has-a-twist-expect-flooding-but-a-lunar-cycle-is-masking-effects-of-sea-level-rise-158412>

Tools for Visualizing Coastal Change

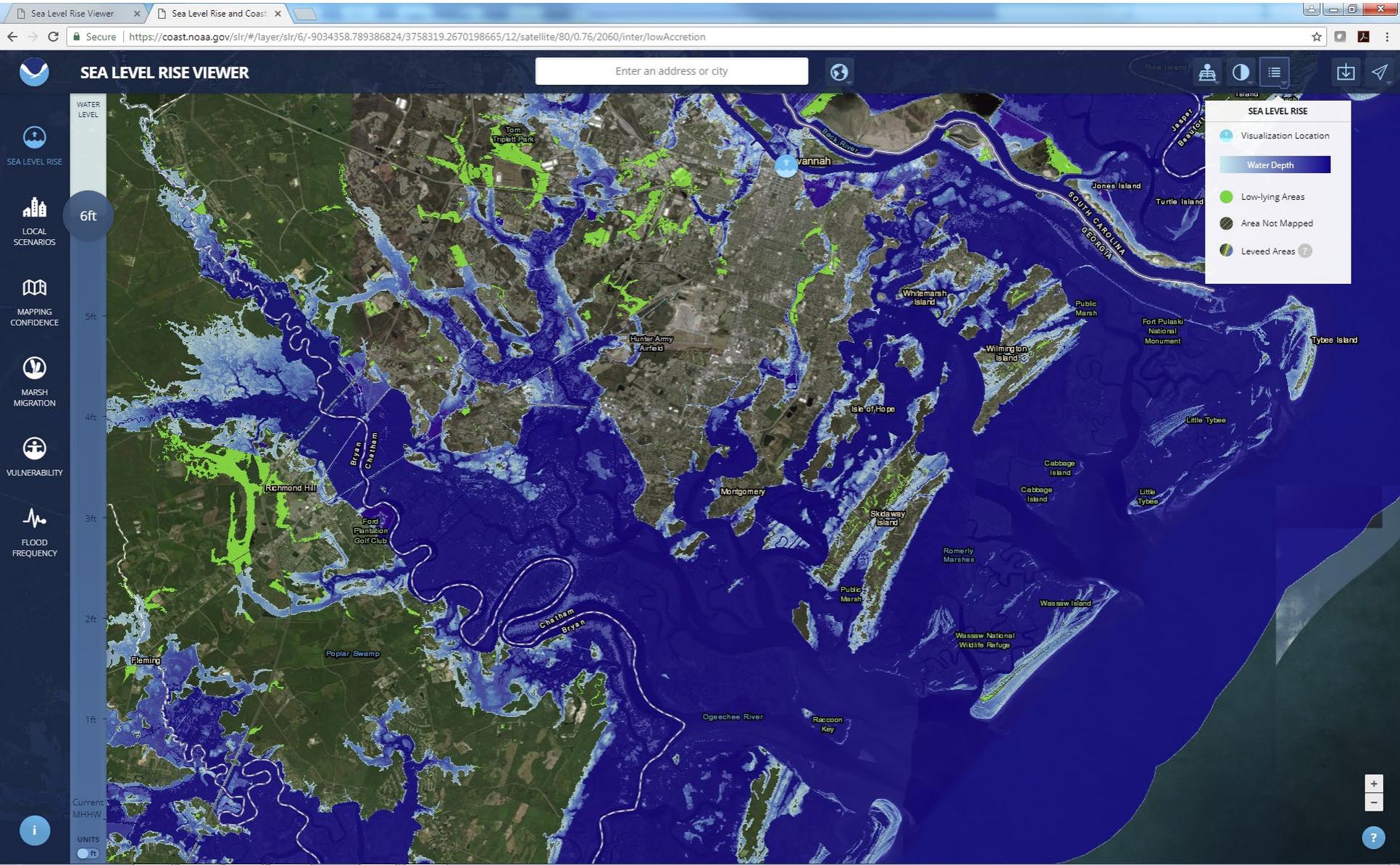


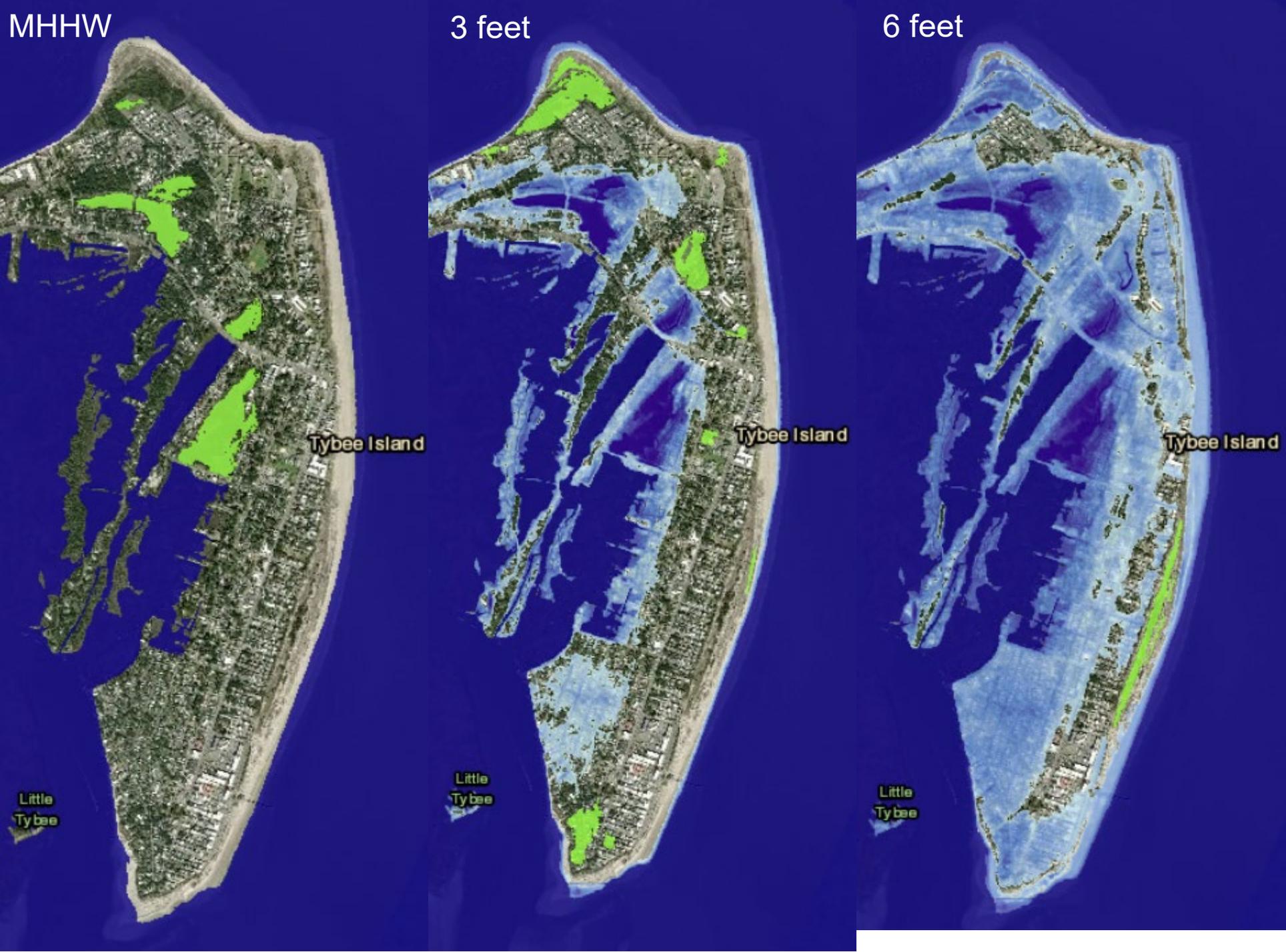
Georgia Coastal Hazards Portal
(gchp.skiio.uga.edu)

- sea level rise models
- flood and storm inundation zones
- shoreline erosion and accretion rates
- historic hurricane tracks
- historic shorelines
- storm hazard modeling

NOAA Digital Coast (<https://coast.noaa.gov/digitalcoast/tools/slr.html>)

Sea level rise – marsh migration – flood frequency





Thanks for your attention!

