Climate and Weather Threats in Florida

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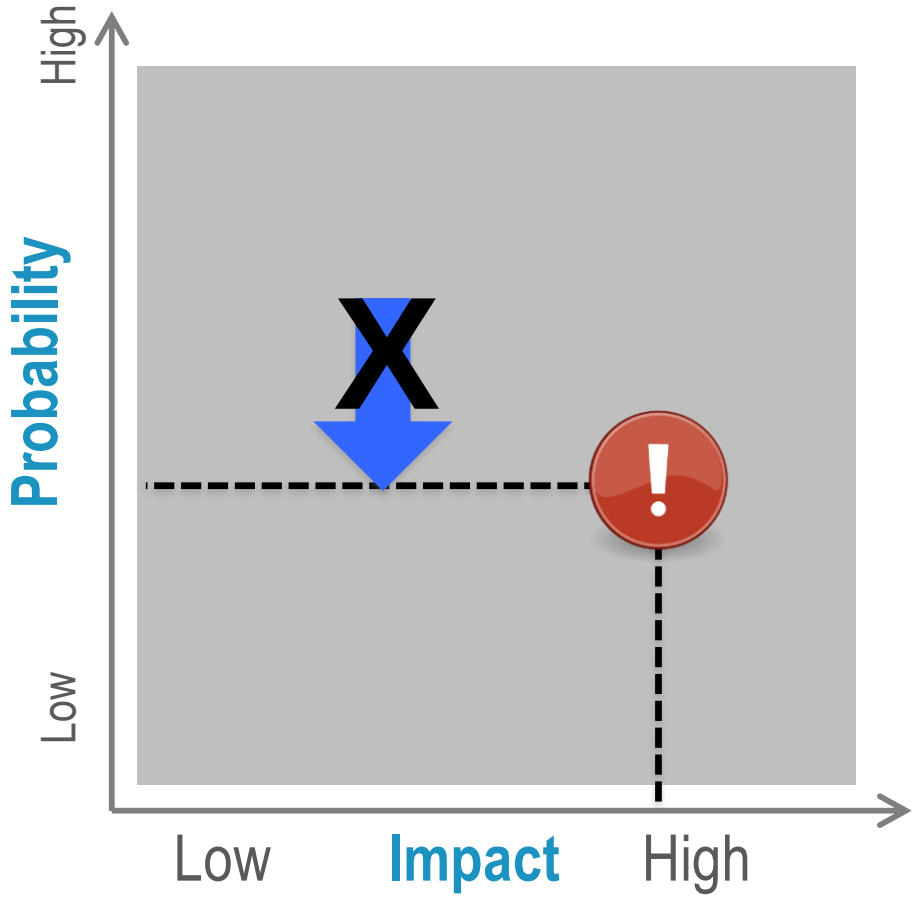
Climate/Weather Threats

- **Sea level rise**
- Extreme rainfall and flooding
- Hurricanes - wind damage, storm surge
- Severe weather – wind, hail, lightning
- **Extreme temperatures – heat waves, severe freezes, prolonged heat or cold**
- Drought

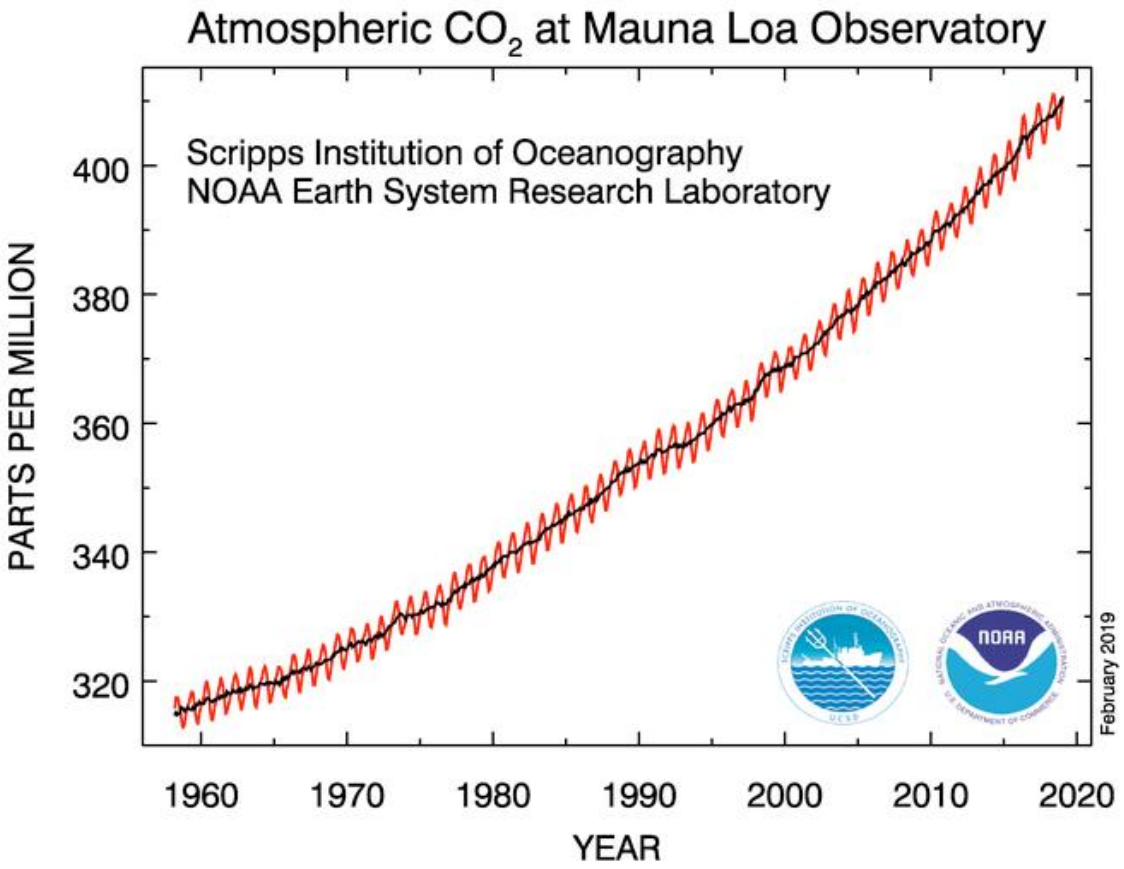
Defining Risk

Risk = Threat X Exposure

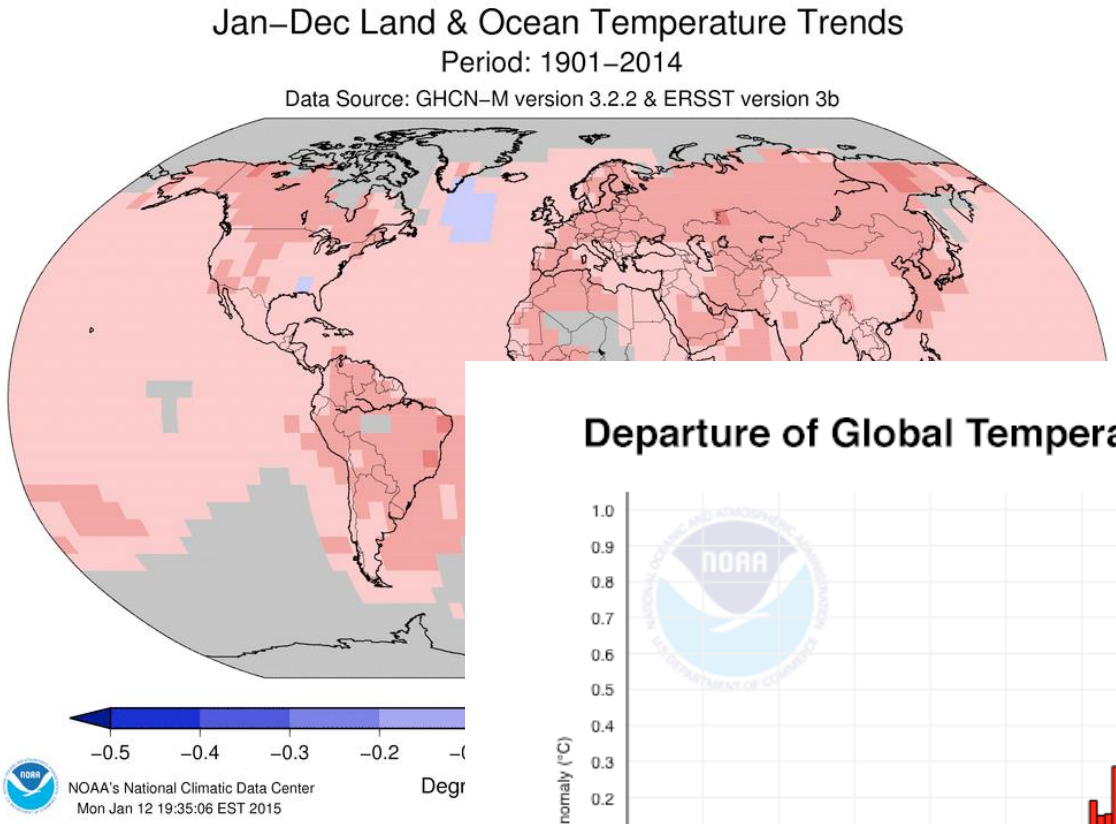
(Probability) (Impact, vulnerability)

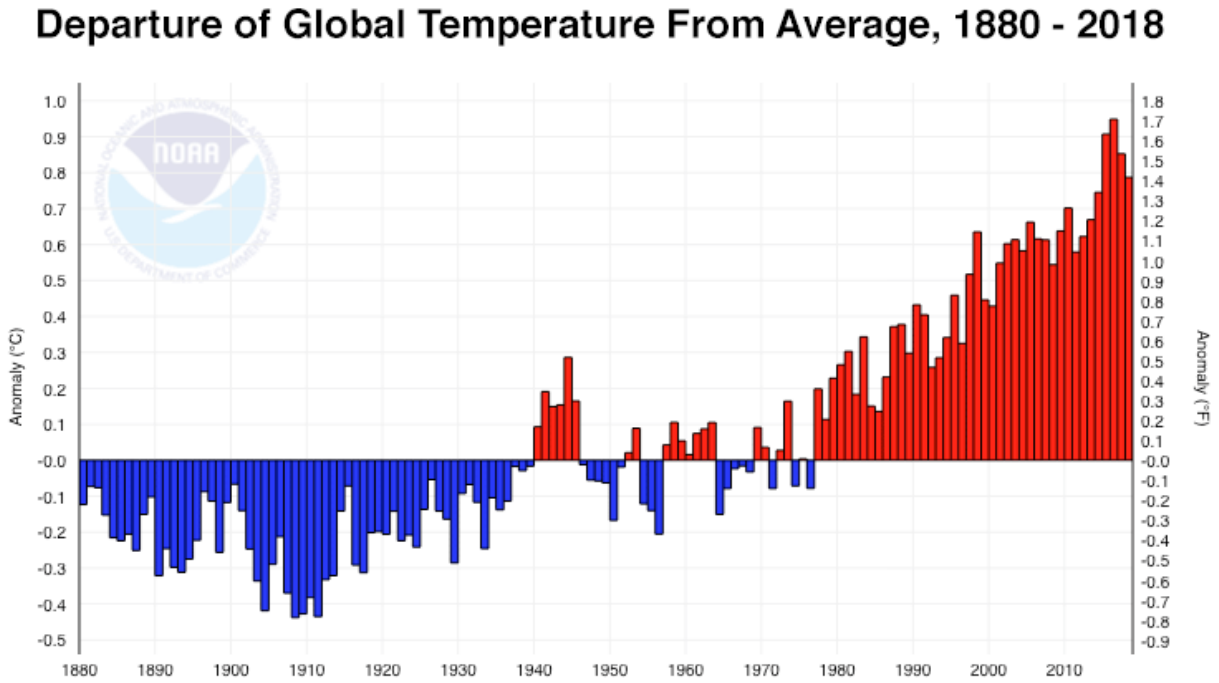


Carbon Dioxide Concentrations

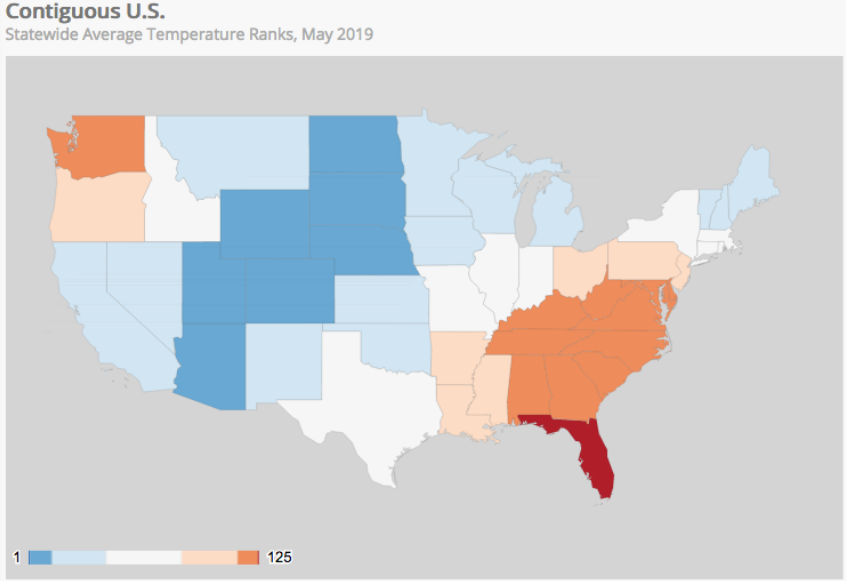


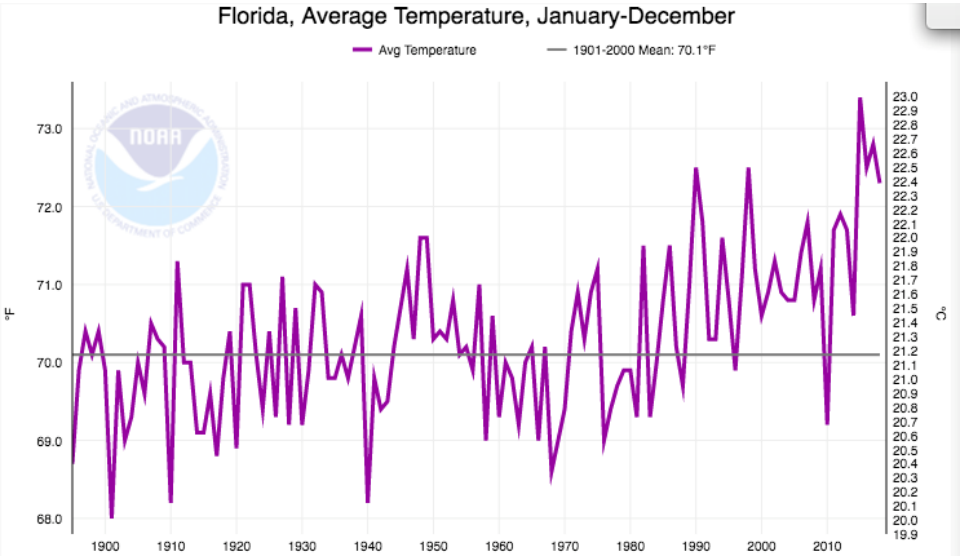
Global Average Temperatures





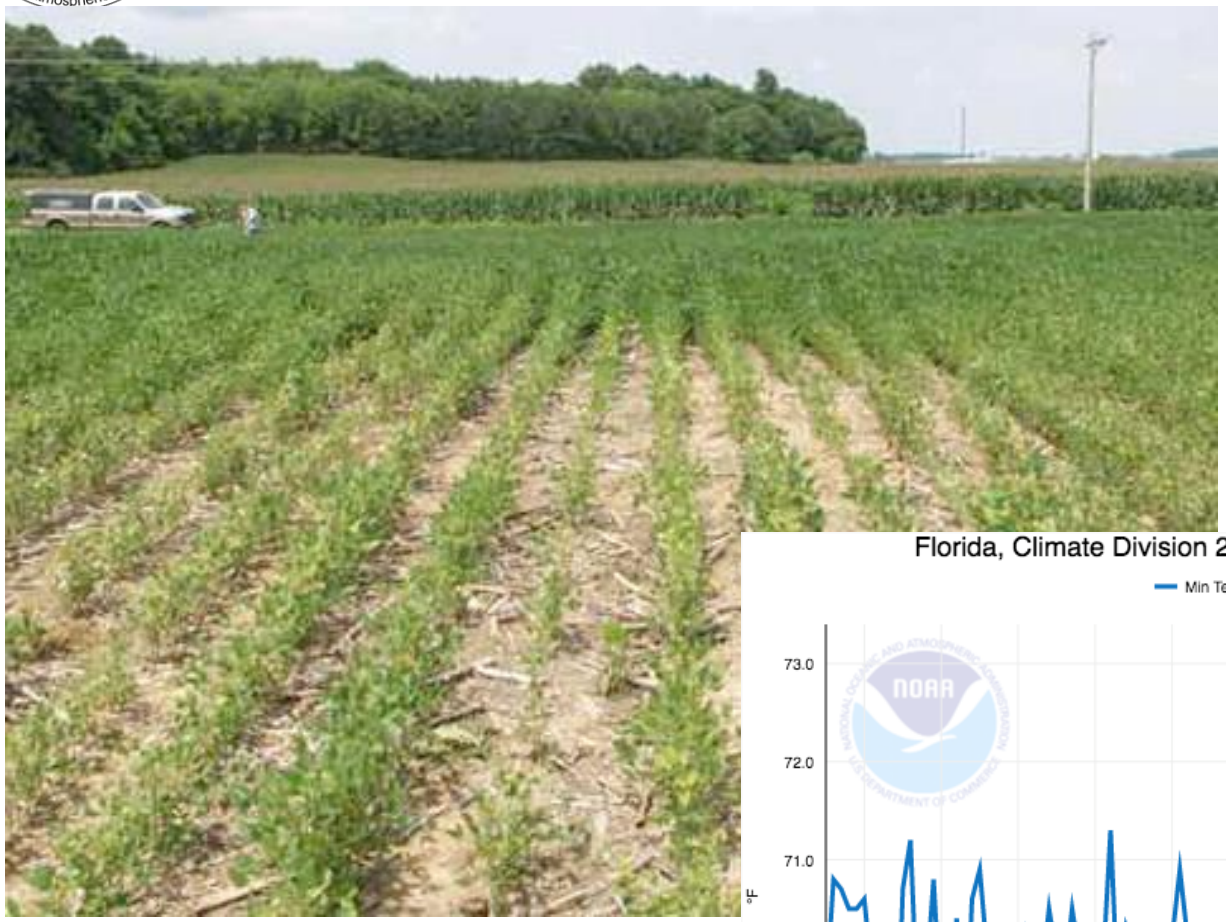
Florida Temperatures

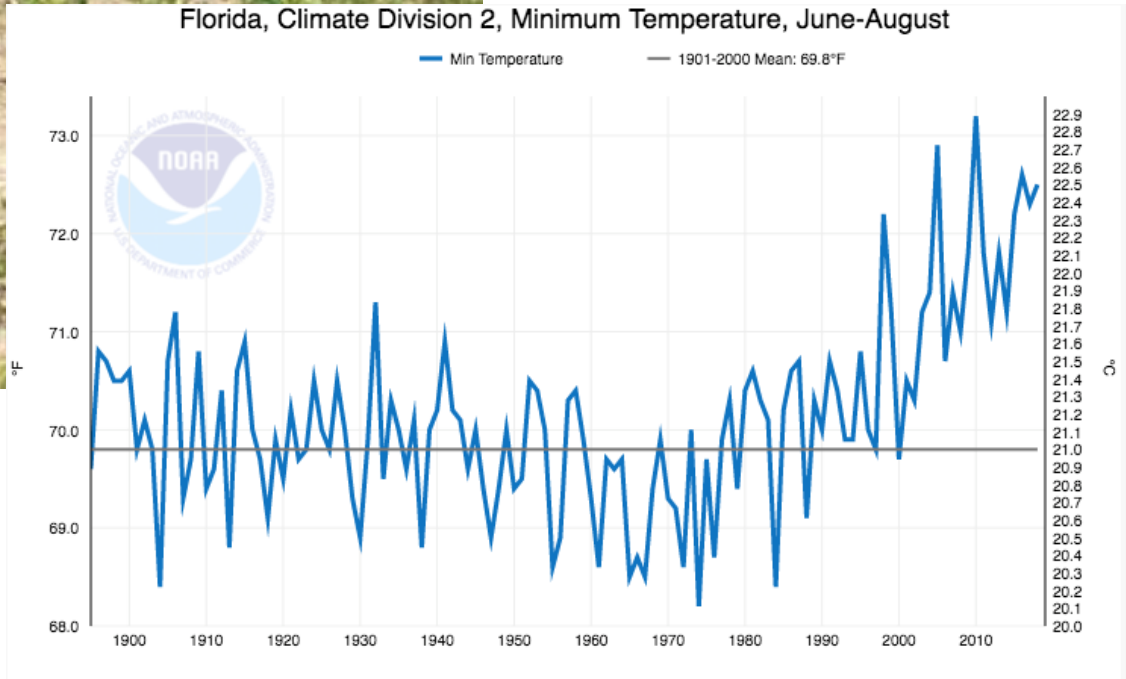




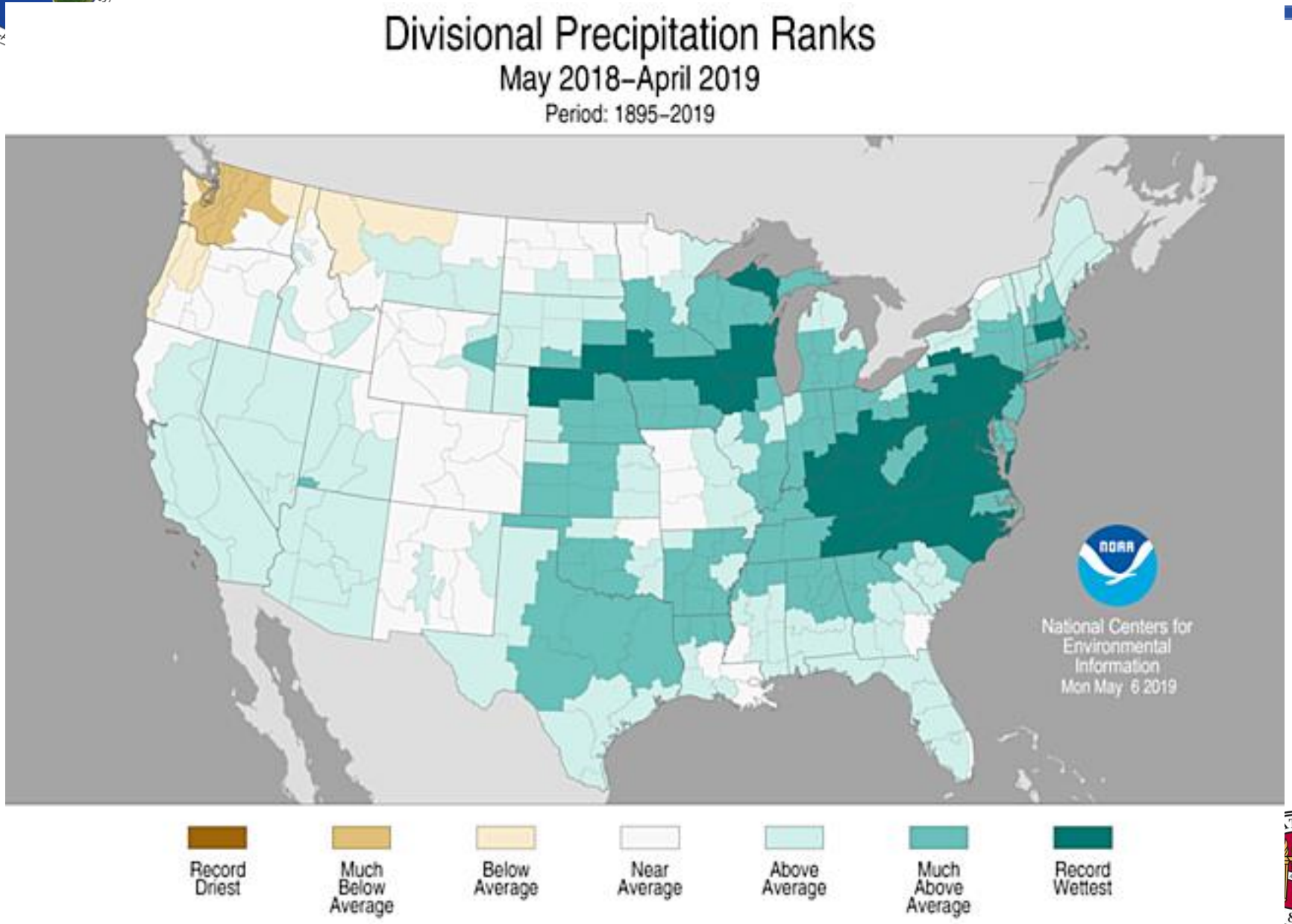
- 49 out of the last 52 months in Florida have been warmer than average
- Includes last 15 months in a row
- Includes 6 months of record warm
- Overnight temperatures affected most

North Florida Summer Nighttime Temperature

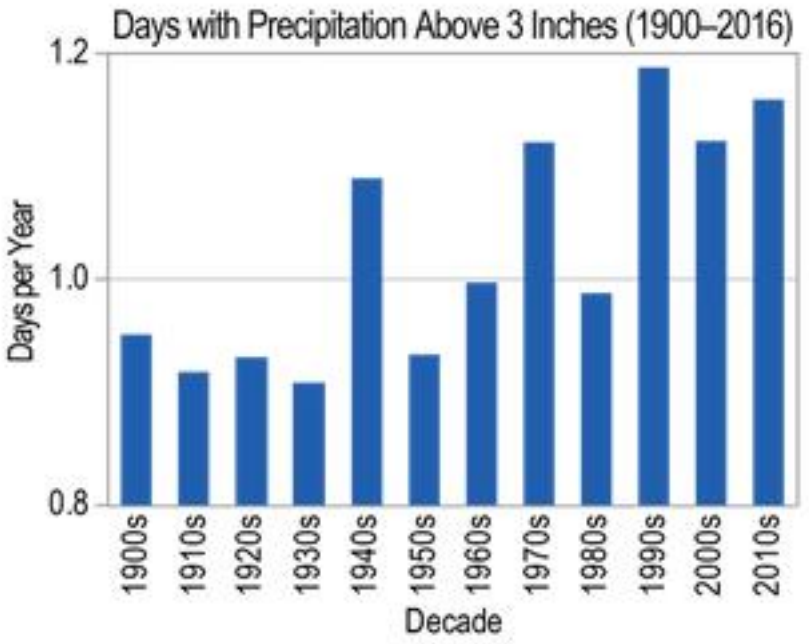


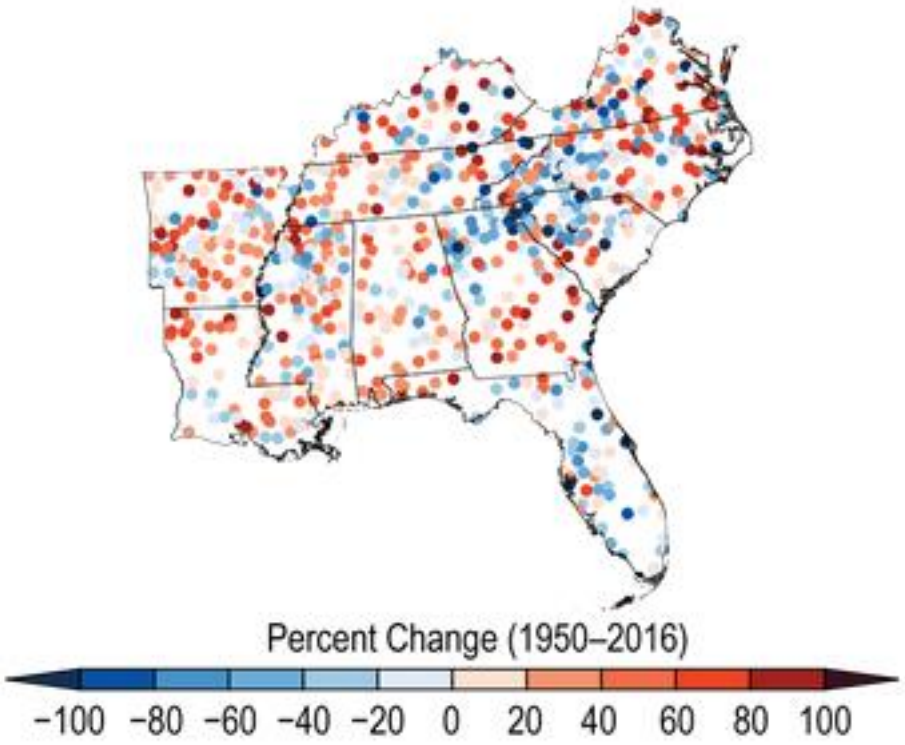


Wettest 12-month period in U.S. History

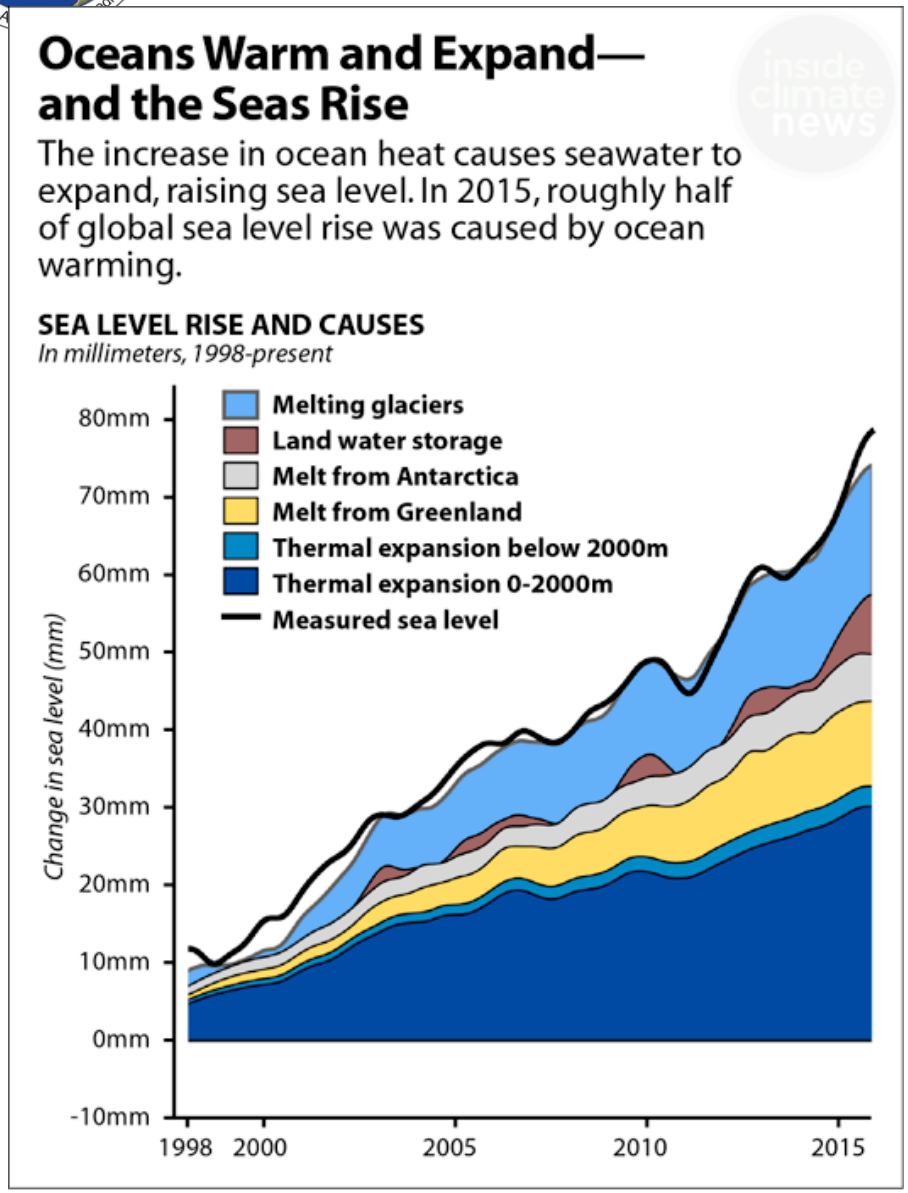


Heavy Precipitation



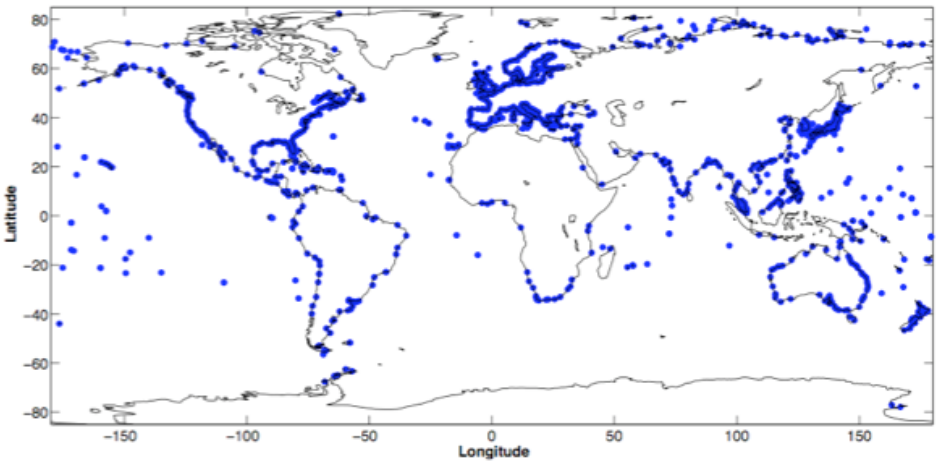


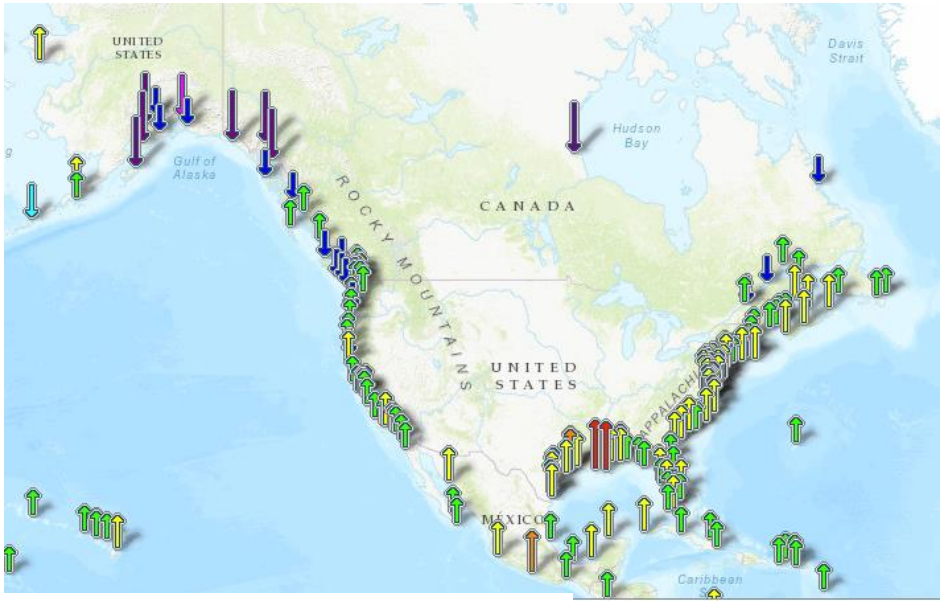
Causes of Sea Level Rise



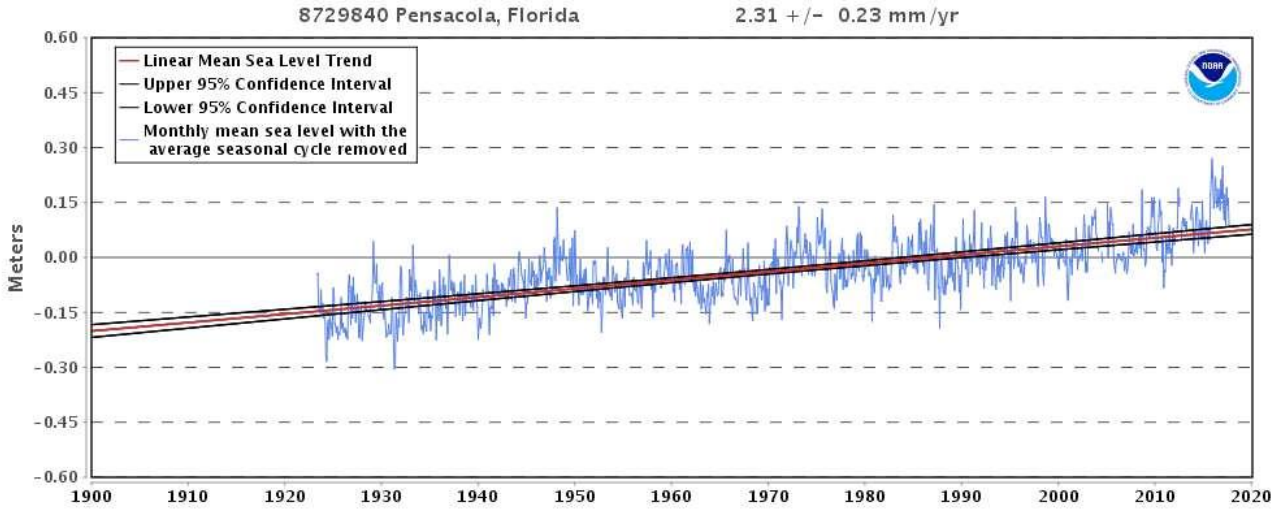
- Thermal expansion of ocean water (steric)
- Melting of glaciers and continental ice sheets
- NOT from melting sea ice

Measuring Sea Level – Tide Gauges

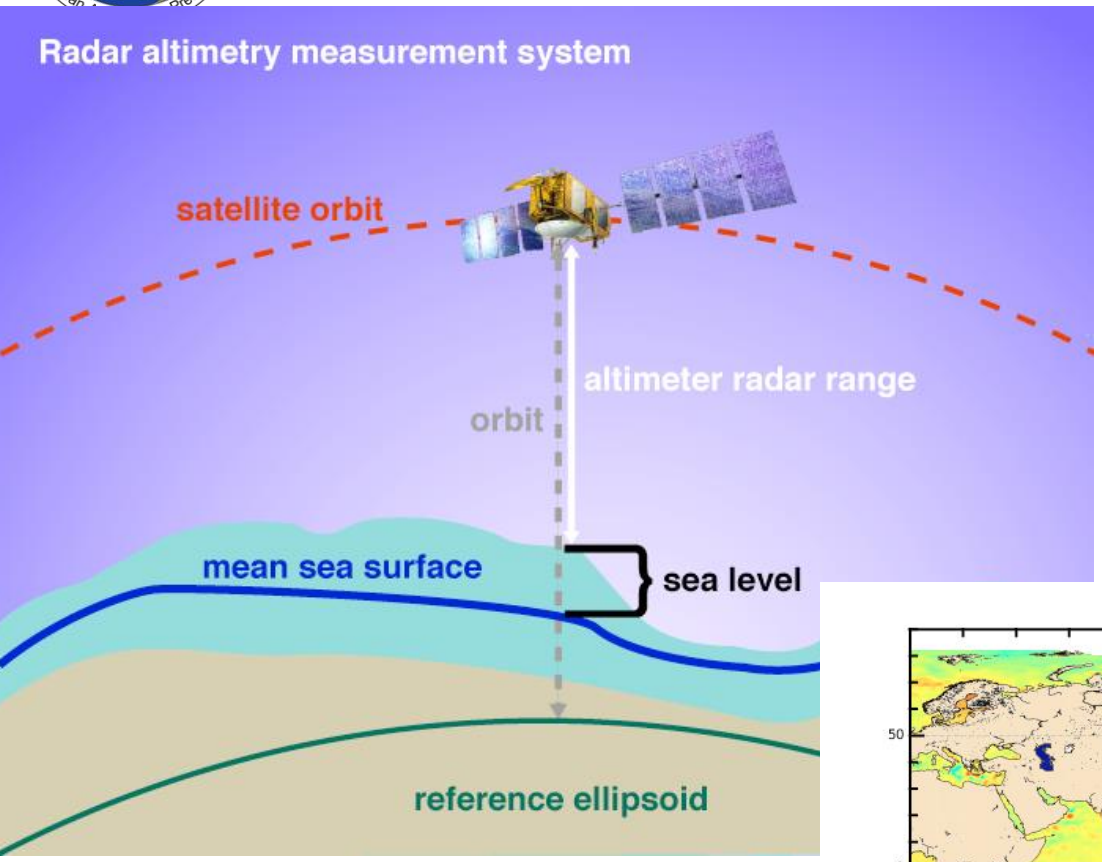




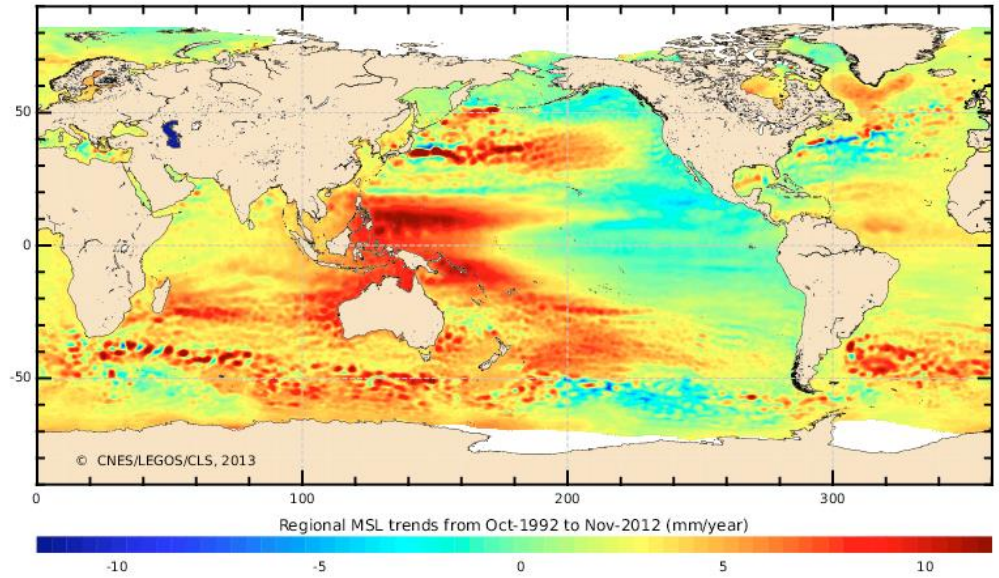
Mean Sea Level Trend
8729840 Pensacola, Florida



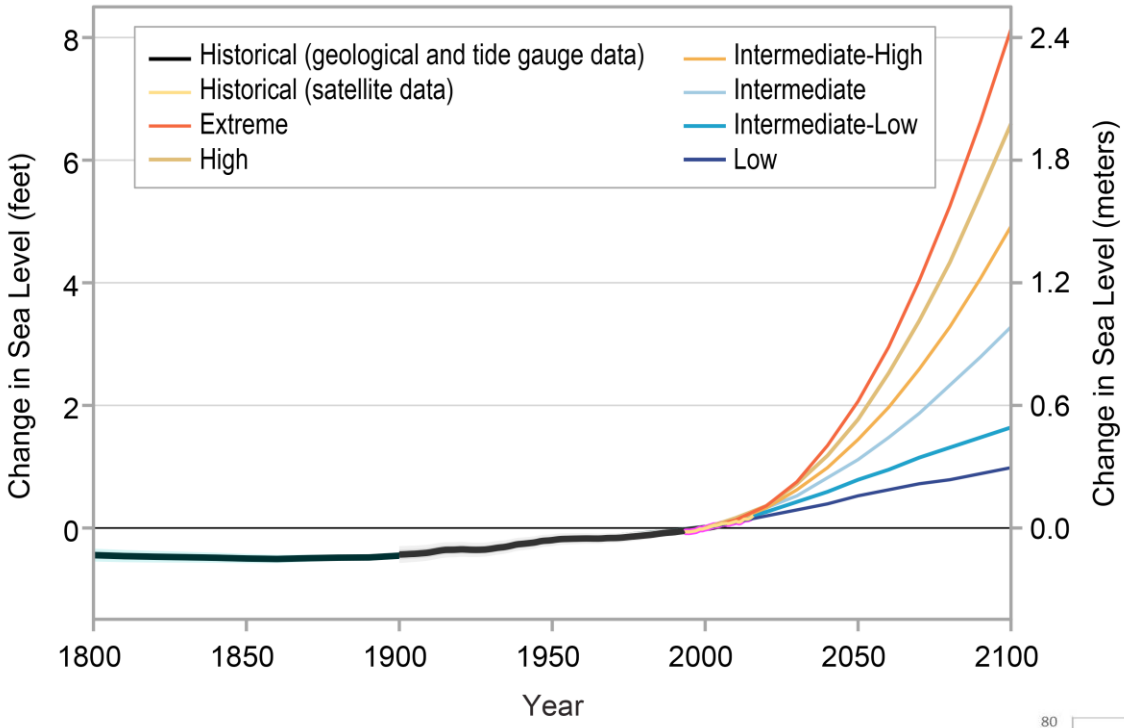
Measuring Sea Level - Altimeters

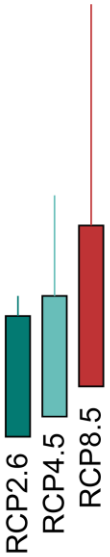


- Reliable observations since 1992
- Precision to within a few millimeters



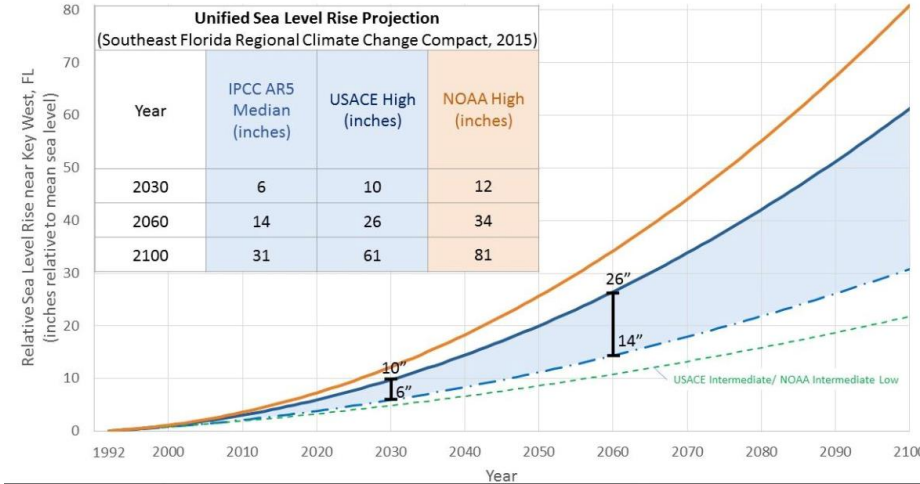
Sea Level Rise



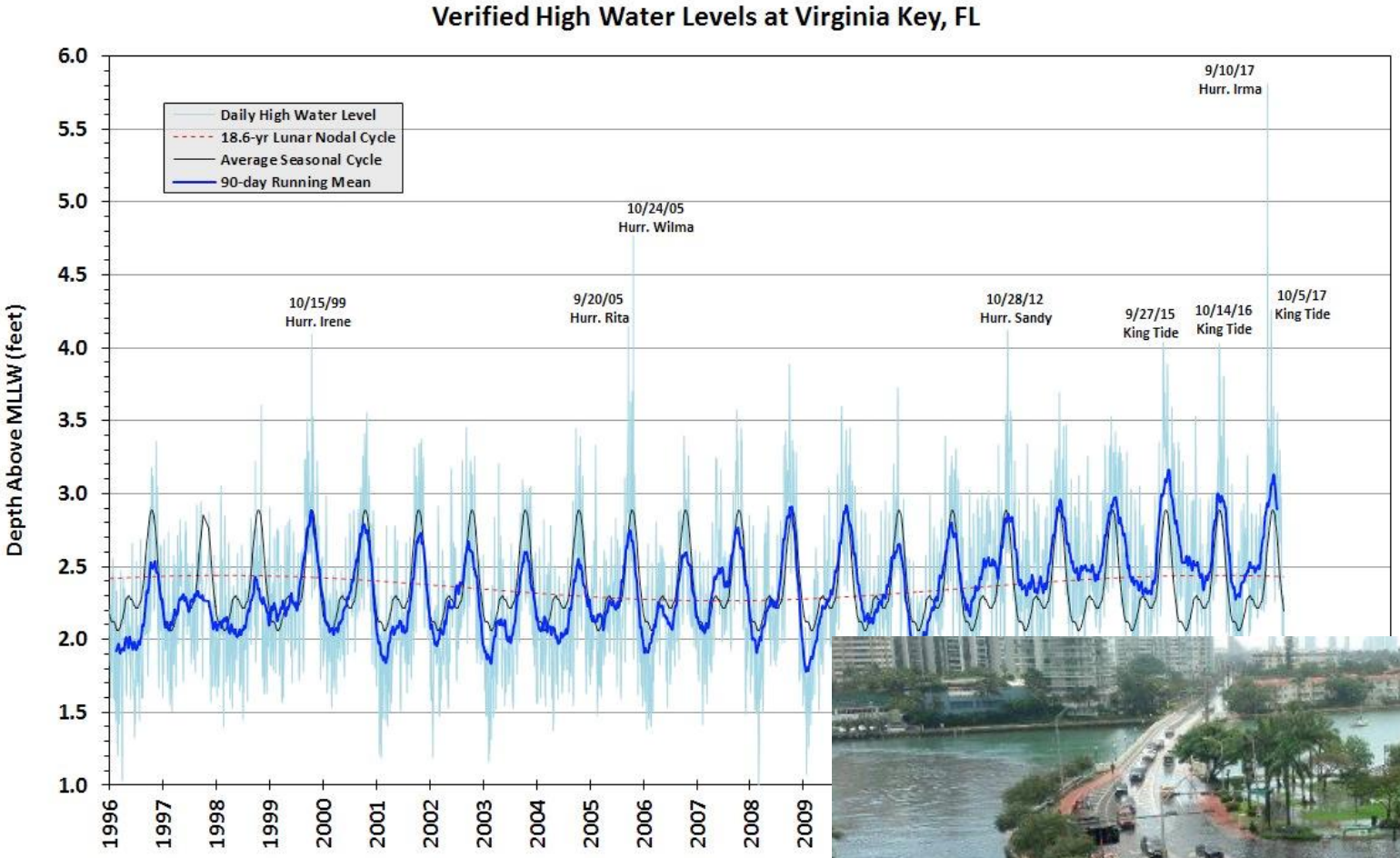


Unified Sea Level Rise Projection
(Southeast Florida Regional Climate Change Compact, 2015)

Year	IPCC AR5 Median (inches)	USACE High (inches)	NOAA High (inches)
2030	6	10	12
2060	14	26	34
2100	31	61	81



Miami Sea Level Rise

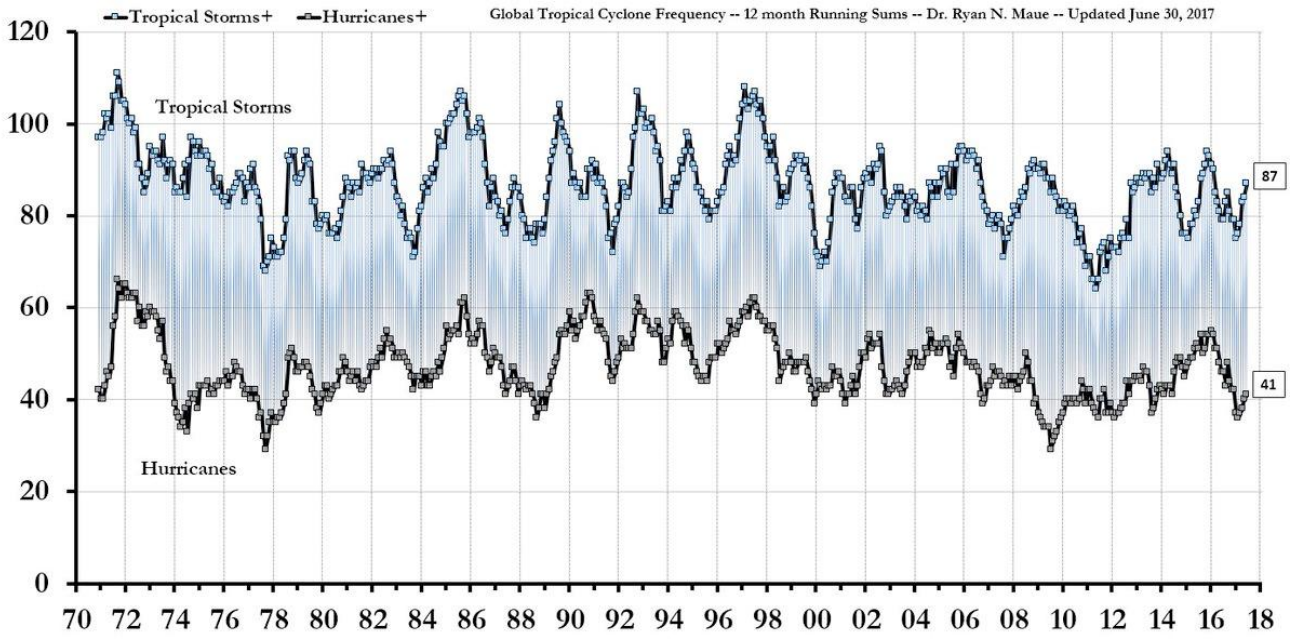


Changes in Tropical Cyclones

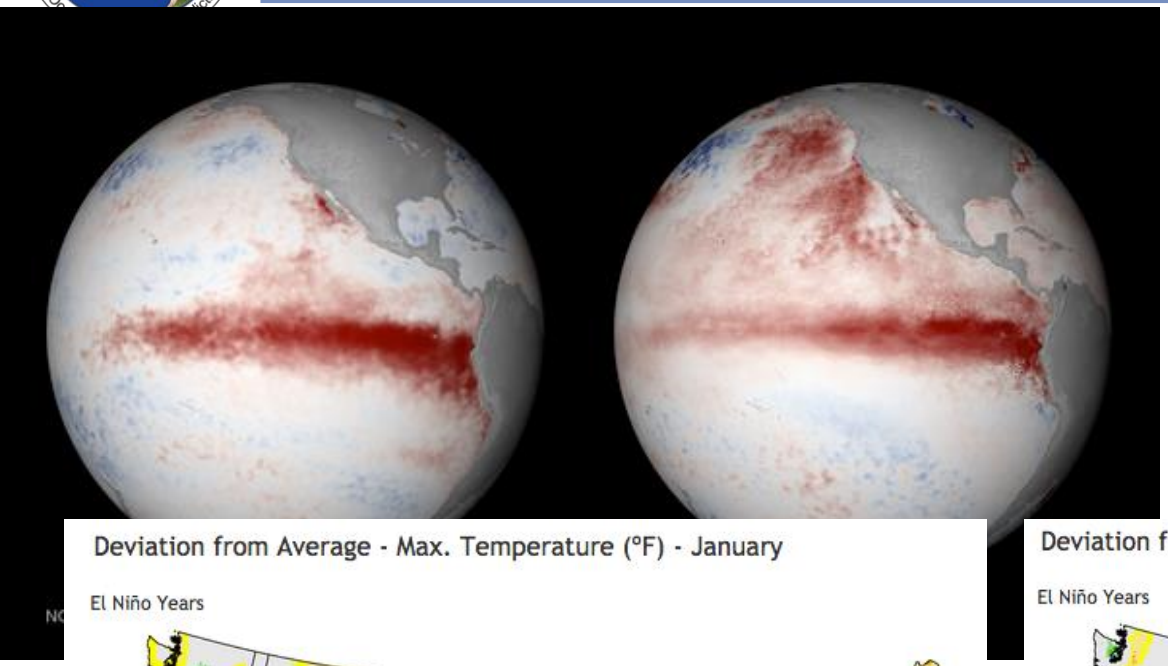
Most confident

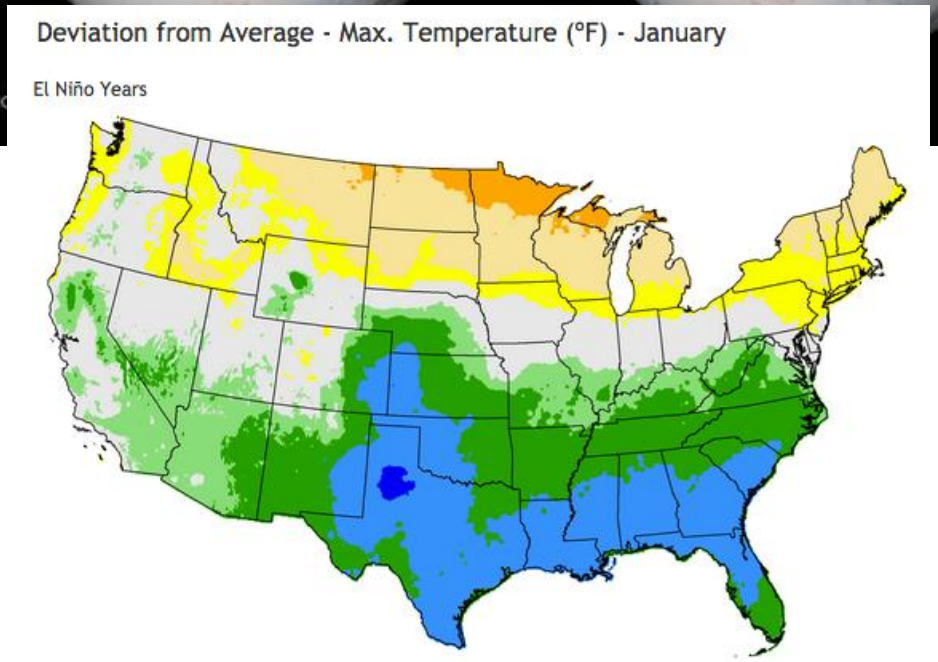
Least confident

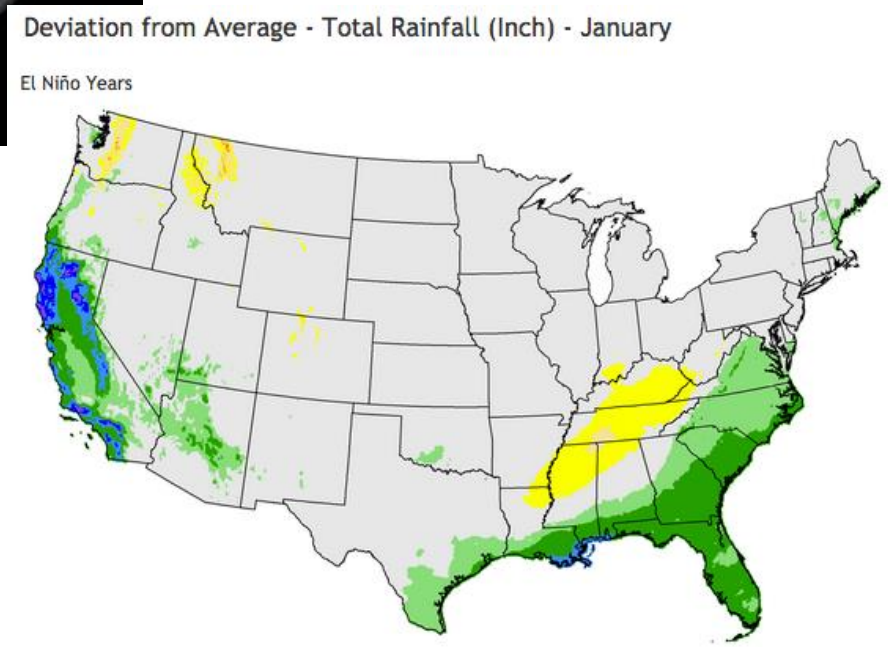
- **Coastal flooding from storm surge will be worse because of sea level rise**
- TC rainfall likely to increase
- TC intensity likely to increase
- Number of TCs likely to change little or decrease



Climate Variability

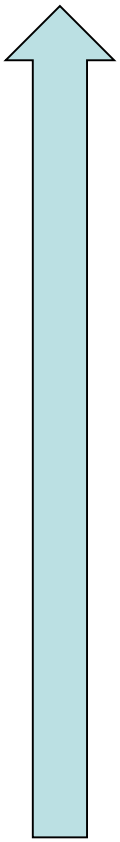






Potential Changes to Climate/Weather Threats

Increasing confidence



Sea level rise – Global sea levels will continue to rise at a minimum the current rate, with the likely range of 1-4 ft. by 2100.

Temperature – very likely to continue rising with increasing CO2. Florida less than interior North America.

Drought – rising temperature alone could lead to more frequent/longer periods of drought. Rainfall changes uncertain.

Rainfall – some evidence of more extreme events, changing seasonal patterns uncertain.

Hurricanes – Uncertain in changes to the number or frequency, strength of strongest storms likely to increas

Severe Weather – difficult to discern past changes, difficult to model