



Severe Weather Risk and Resilience in Coastal Virginia

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Severe Weather Risk and Resilience

- What are we observing?
- Regional Risk
- Vulnerability/Risk to Tourism Businesses
- Resilience Approaches and Measures

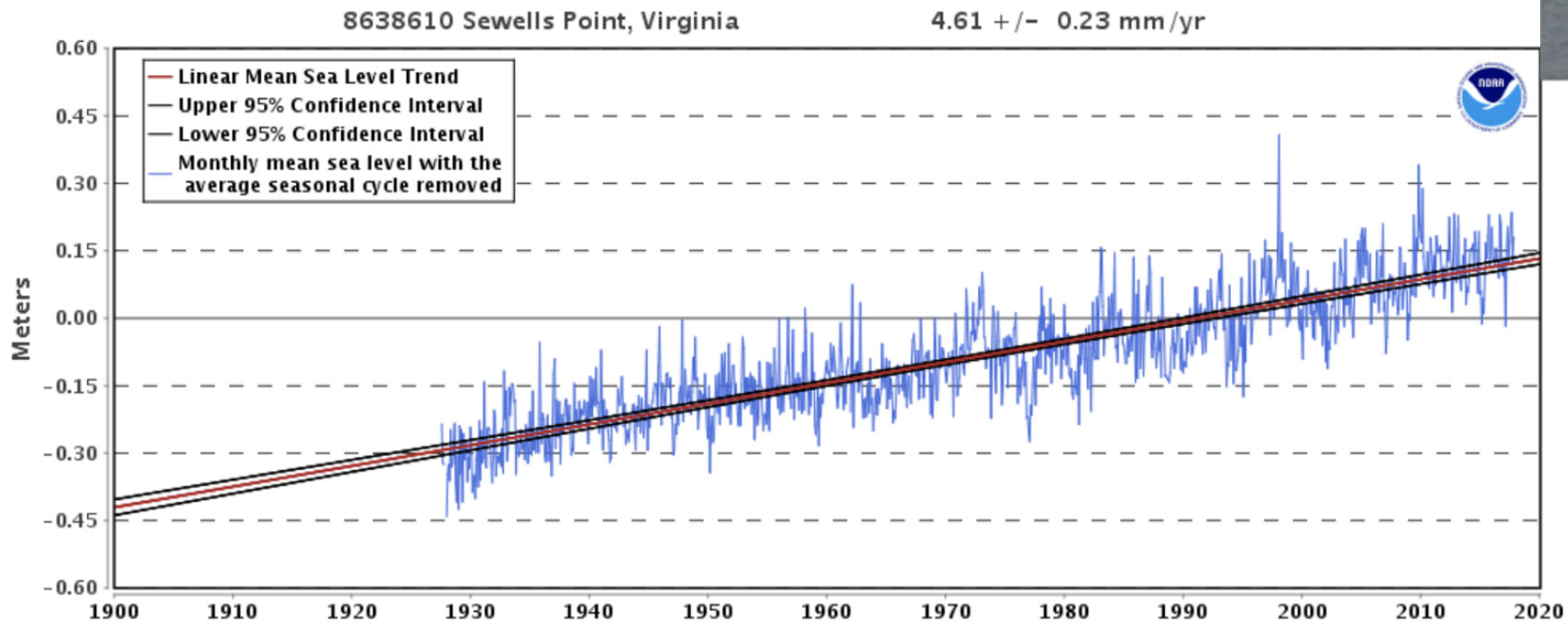




Measuring Water Levels

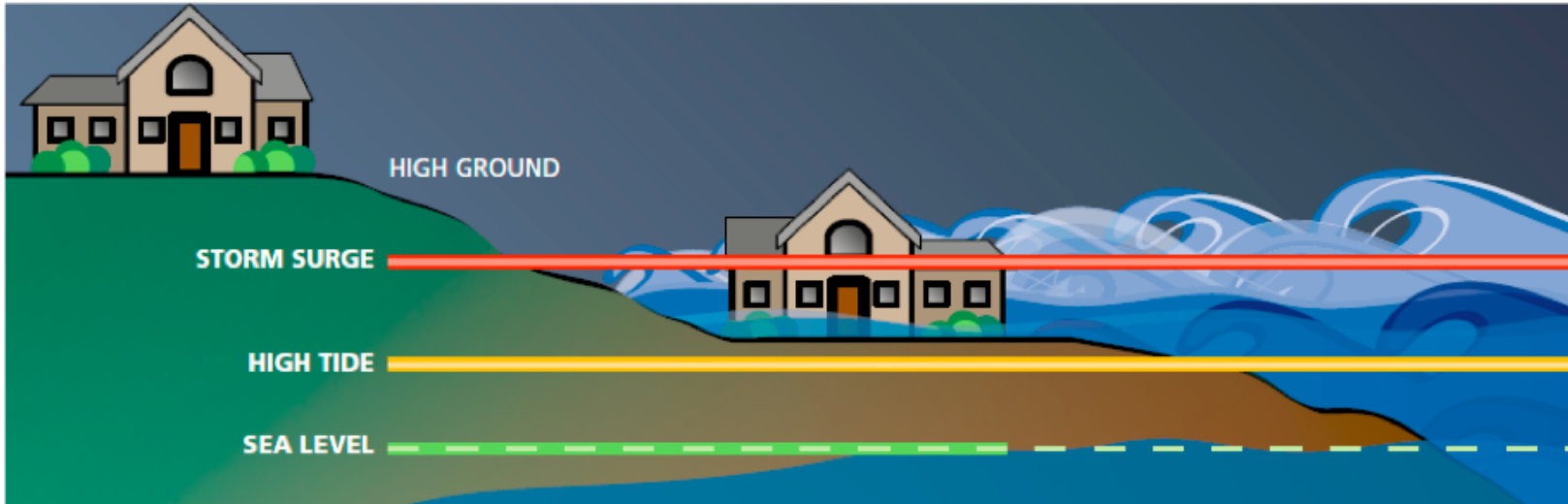


**Mean Sea Level Trend
8638610 Sewells Point, Virginia**





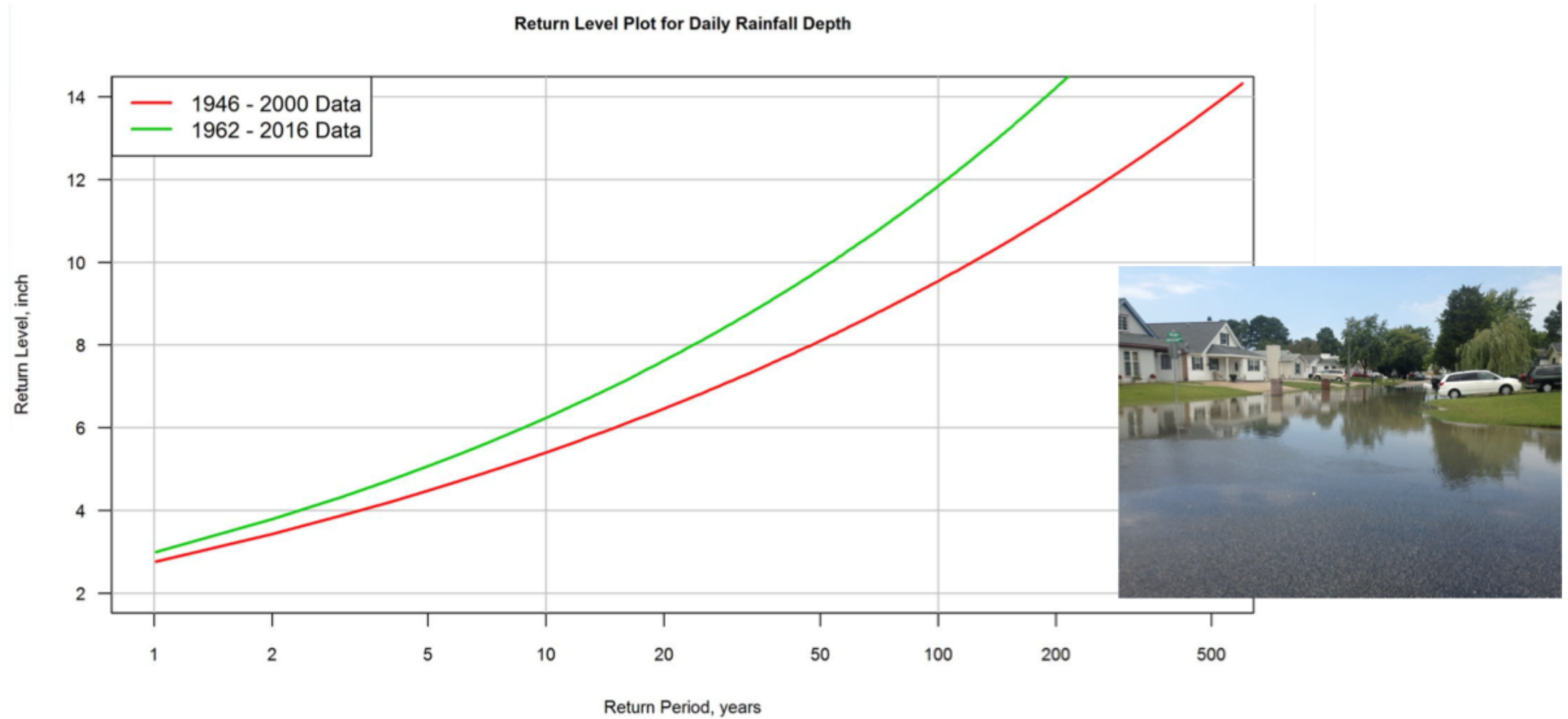
Storm Surge Flooding



Virginia Department of Emergency Management,
[Virginia Hurricane Evacuation Guide](#)



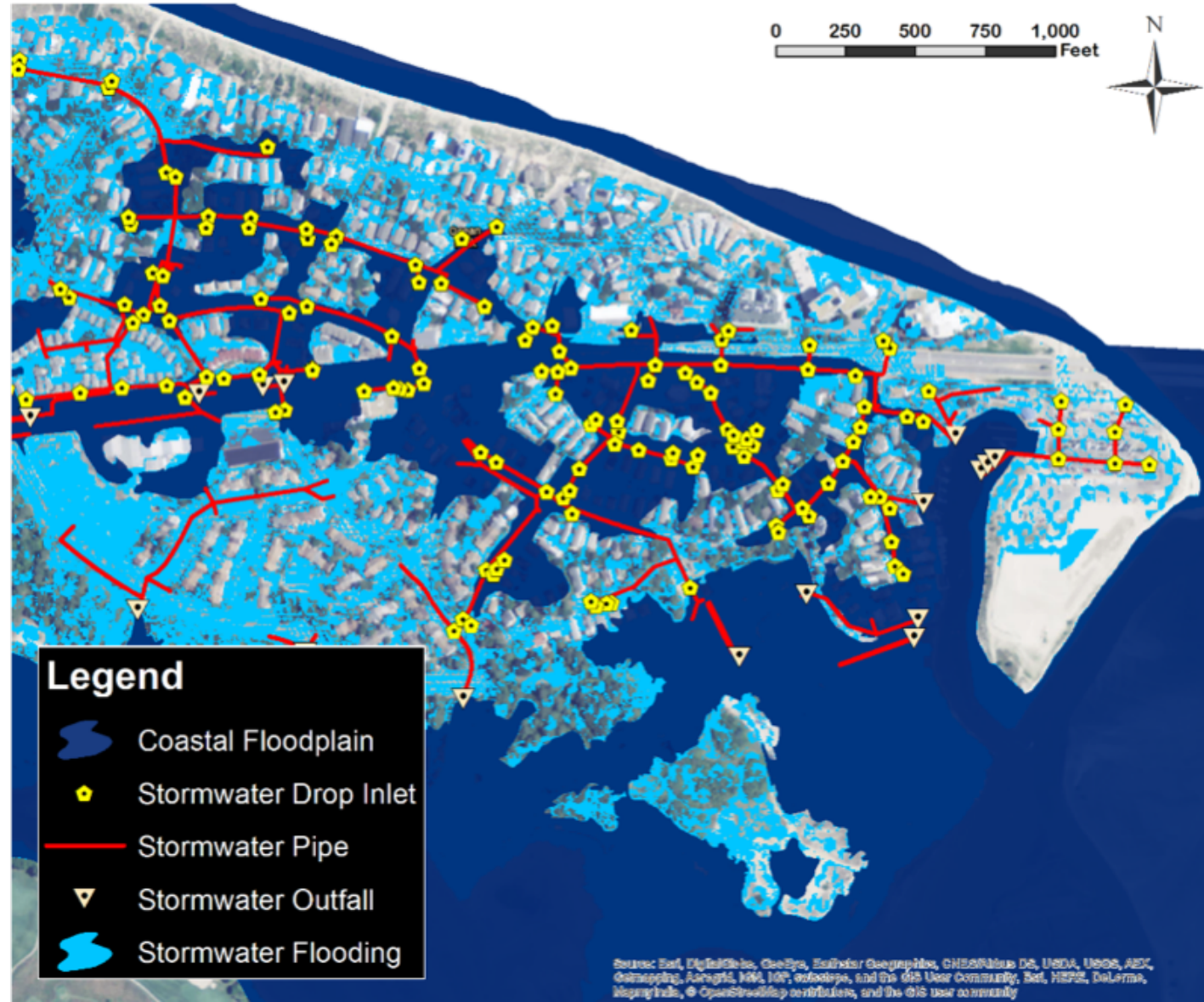
Changing Rainfall Patterns



Study by Peter Pommerenk, Ph.D., P.E.
City of Virginia Beach



Combined Flooding

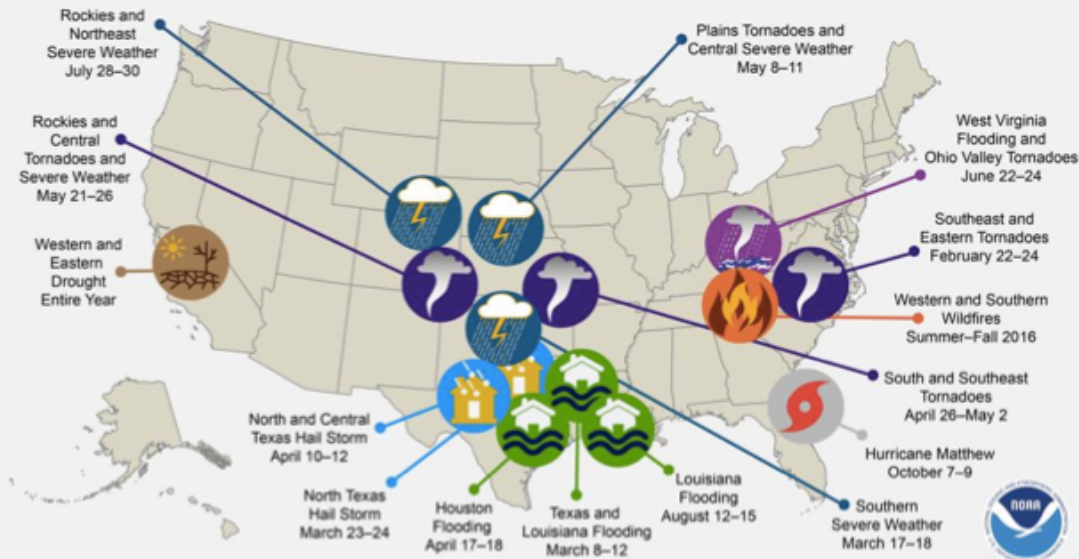


U.S. 2017 Billion-Dollar Weather and Climate Disasters



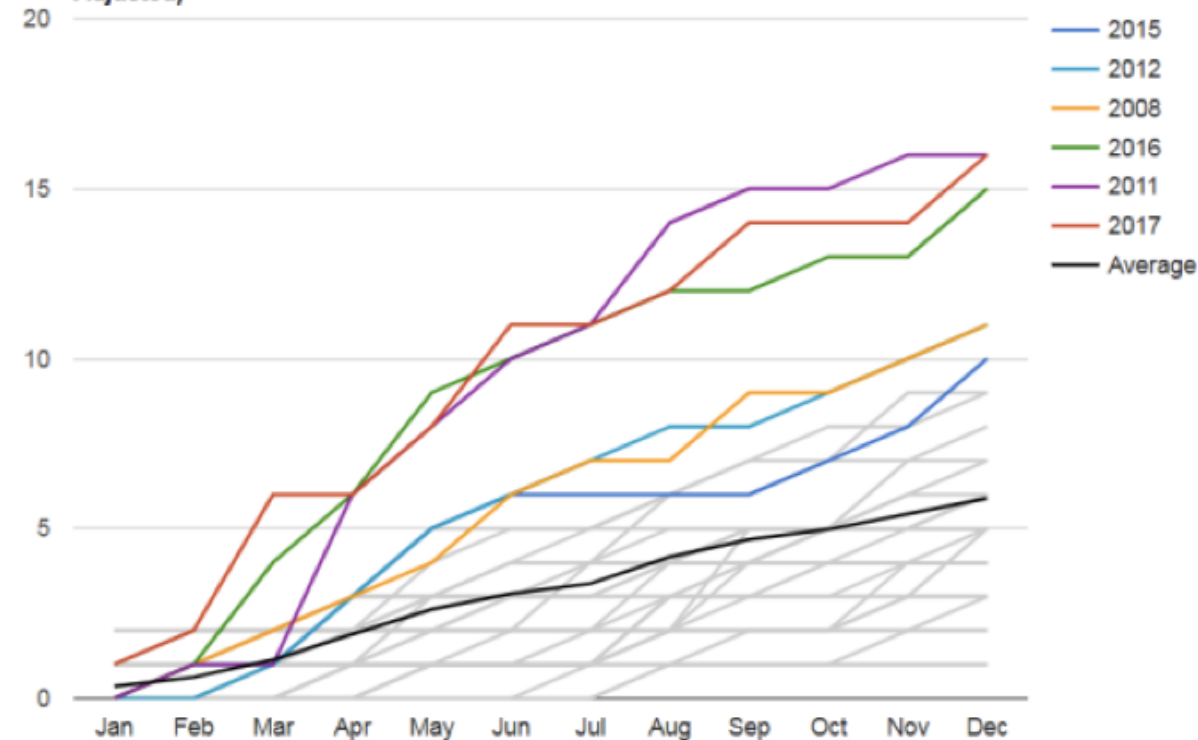
This map denotes the approximate location for each of the 16 billion-dollar weather and climate disasters that impacted the United States during 2017.

U.S. 2016 Billion-Dollar Weather and Climate Disasters



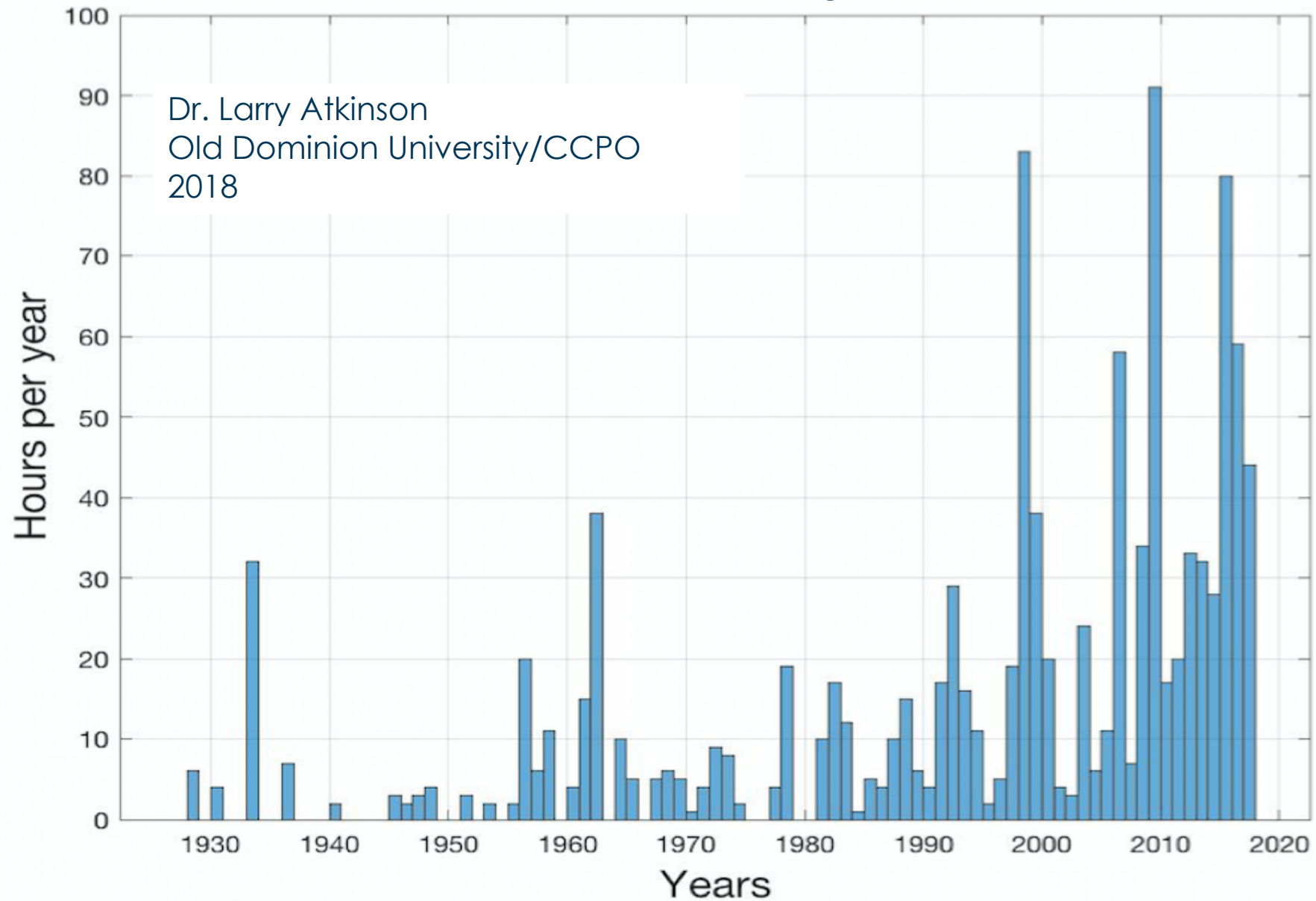
This map denotes the approximate location for each of the 15 billion-dollar weather and climate disasters that have impacted the United States during 2016.

1980-2017 Year-to-Date United States Billion-Dollar Disaster Event Frequency (CPI-Adjusted)





Hours per year nuisance flooding on Hampton Blvd.



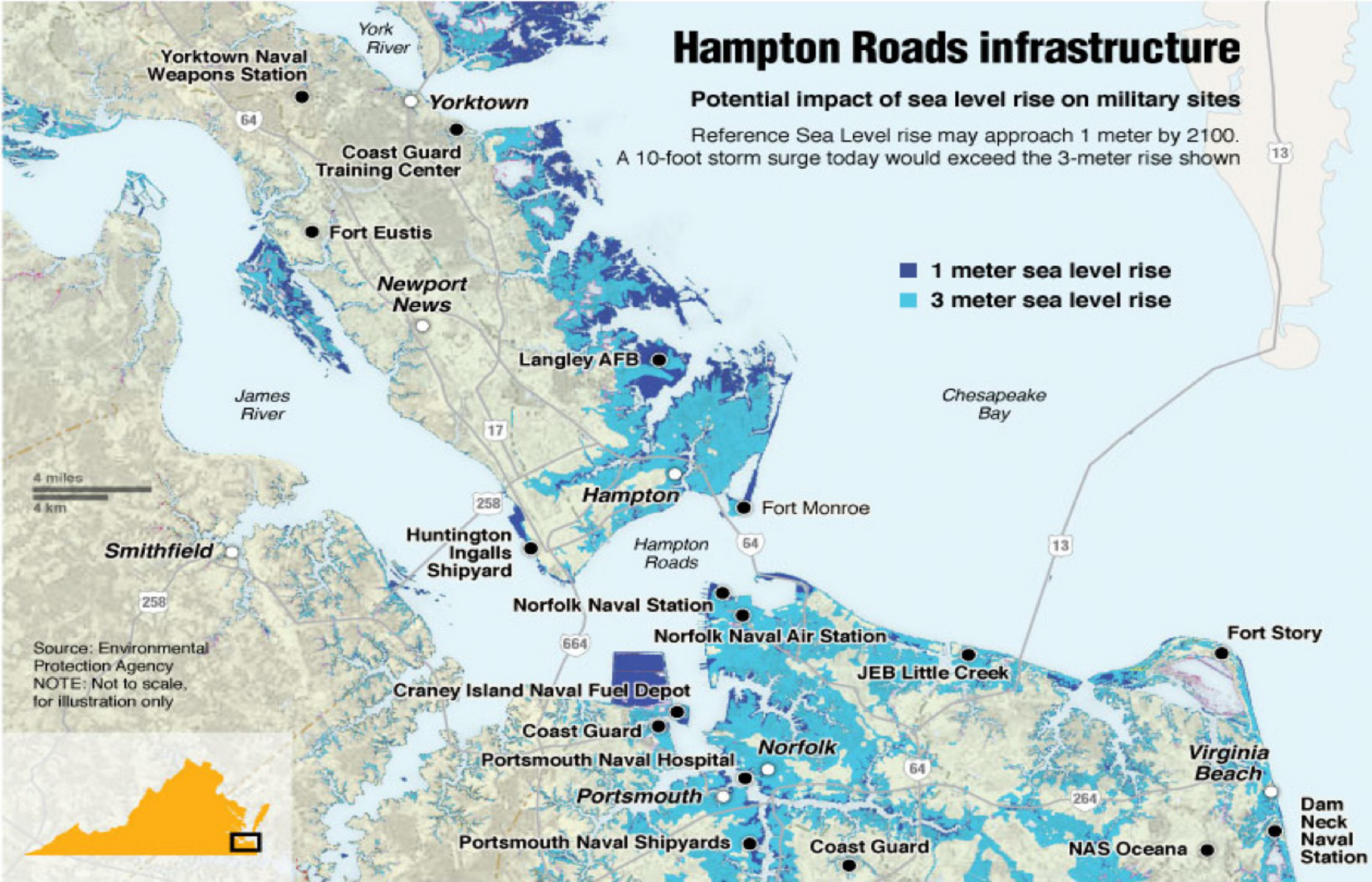


Hampton Roads infrastructure

Potential impact of sea level rise on military sites

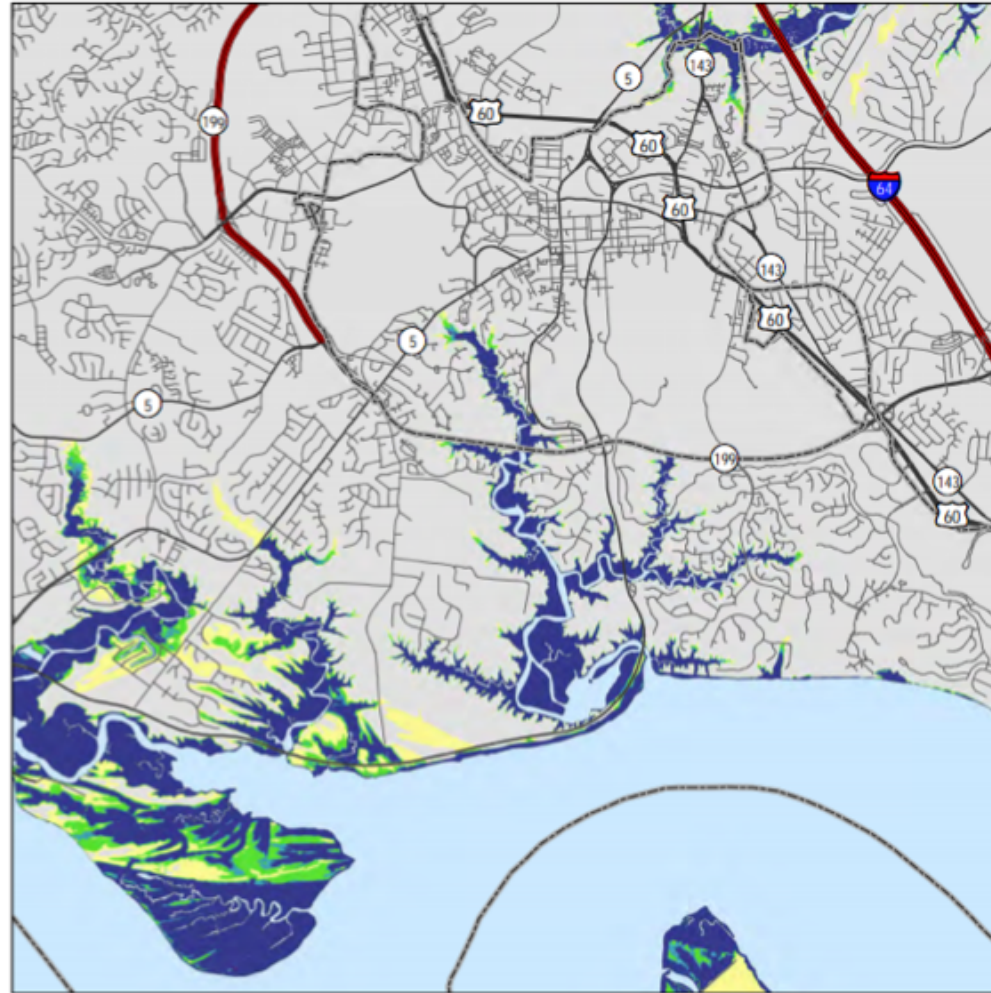
Reference Sea Level rise may approach 1 meter by 2100.
A 10-foot storm surge today would exceed the 3-meter rise shown

- 1 meter sea level rise
- 3 meter sea level rise



MAP 13

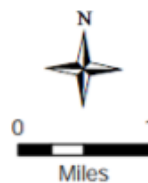
Areas Potentially Vulnerable to Sea Level Rise by 2100



Legend

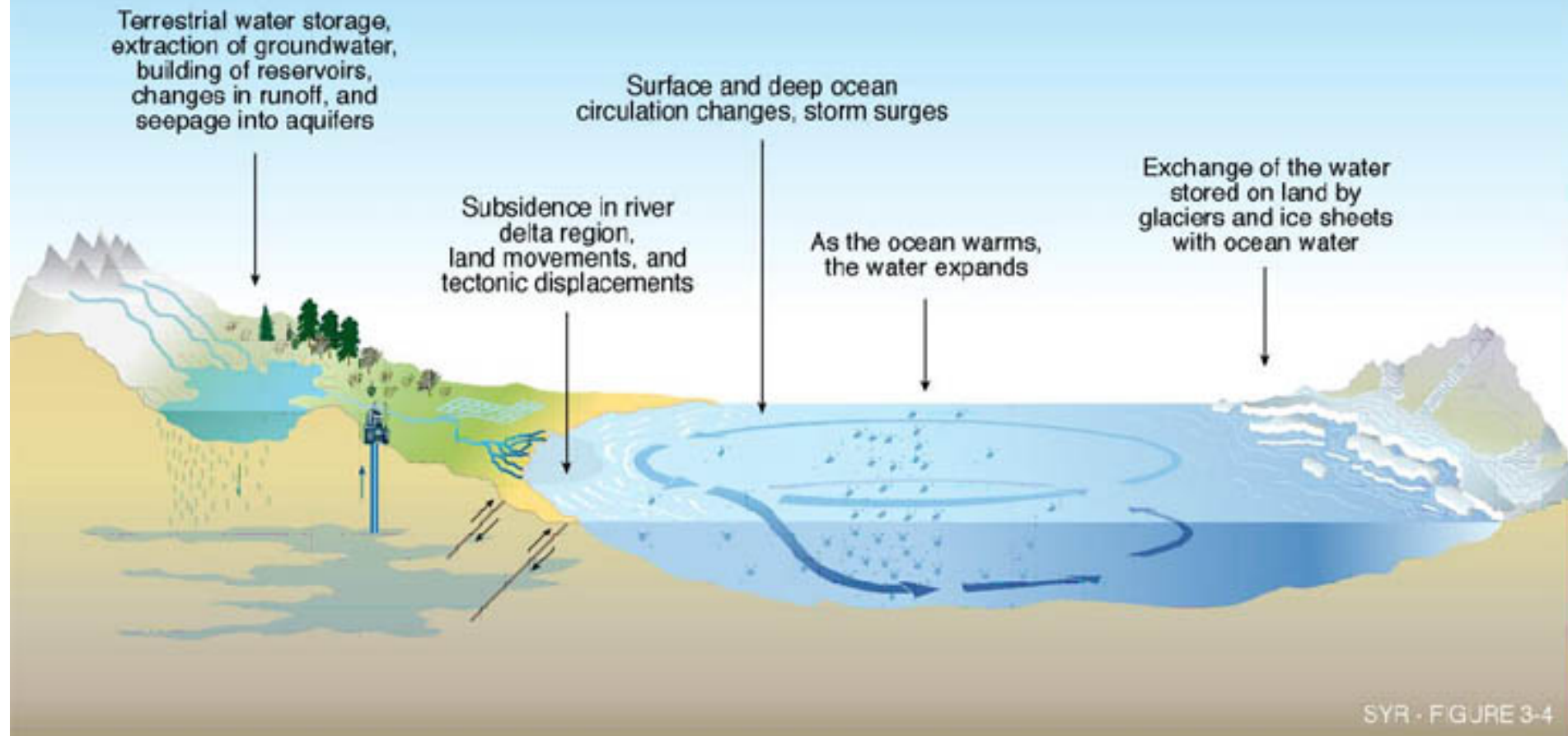
- Historic Scenario (1.6')
- Low Scenario (2.6')
- Intermediate Scenario (4.9')
- High Scenario (7.5')

Projections are for the Sewell's Point tide gauge in Norfolk, Virginia, and are based on global sea level rise scenarios developed for the 2013 National Climate Assessment.



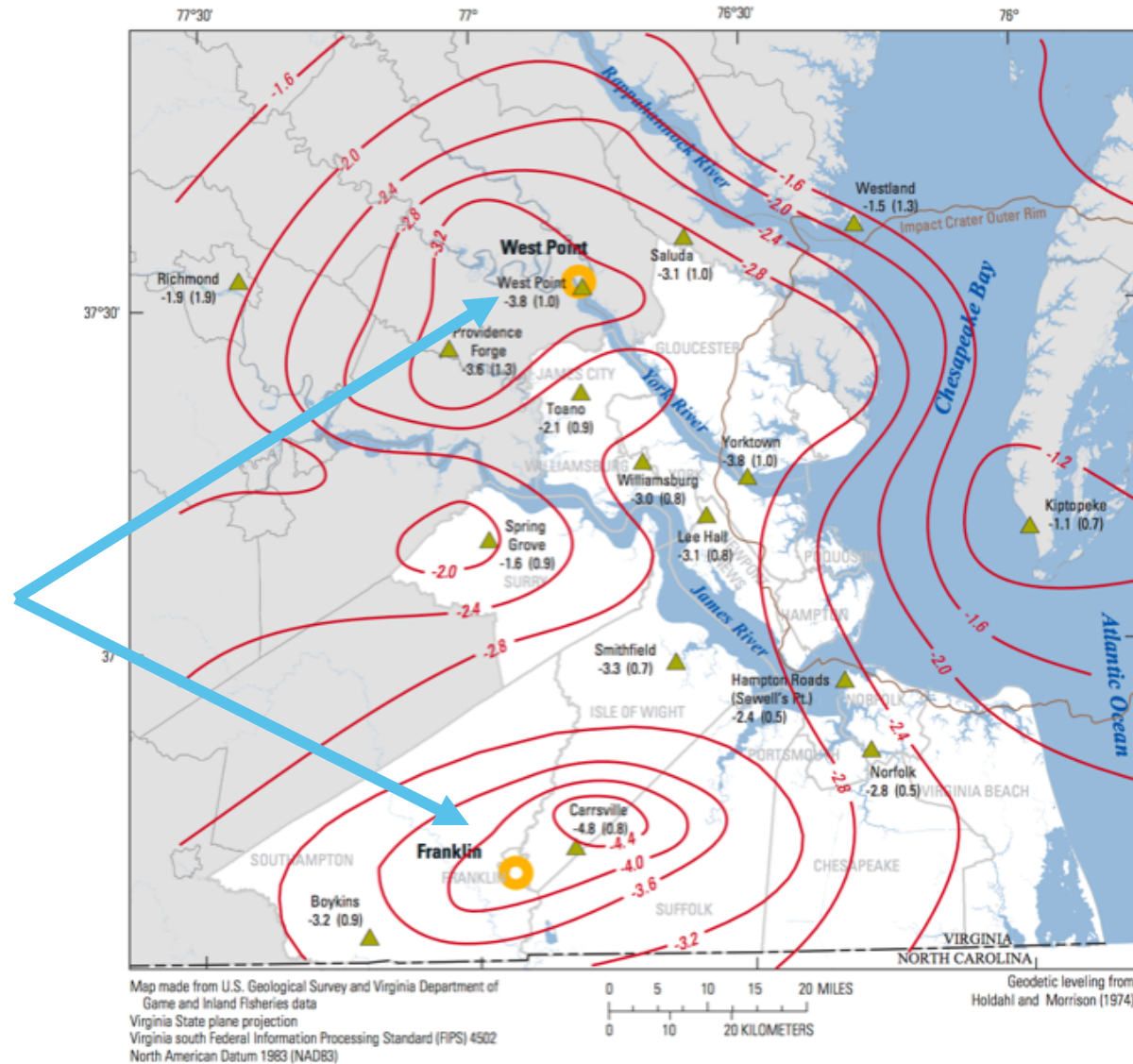


What causes the sea level to change?



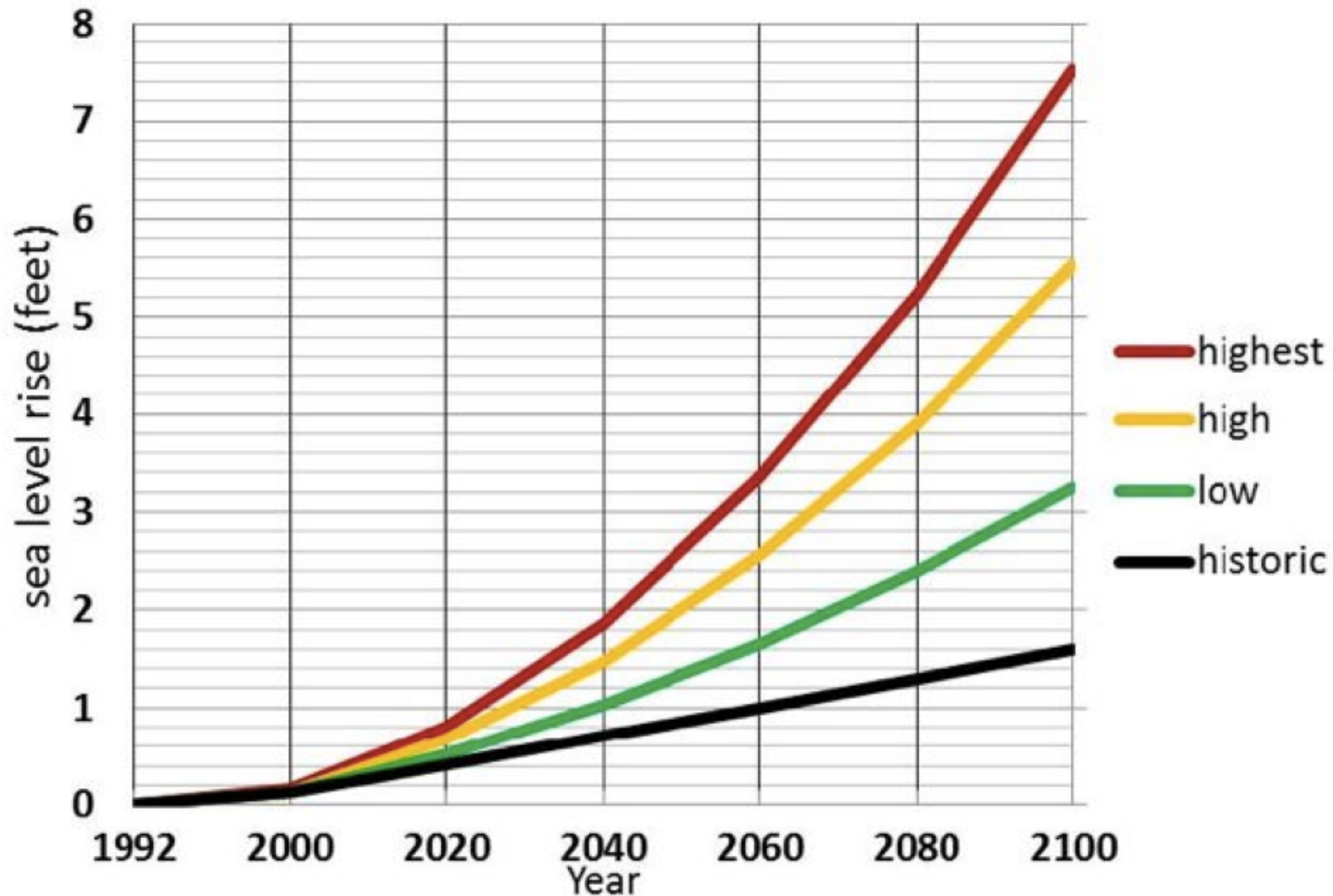


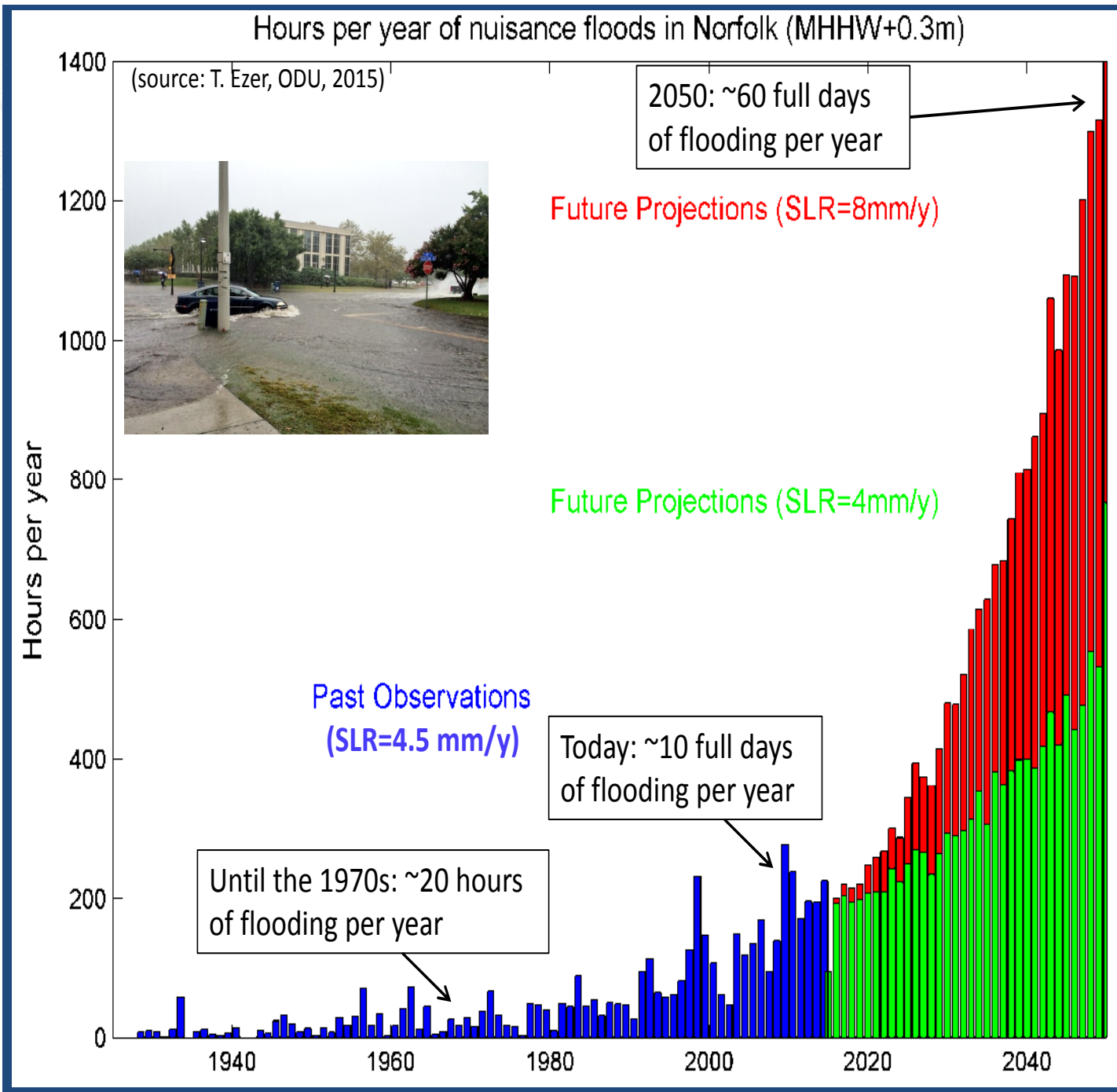
Land subsidence about 1 ft. per century in Virginia





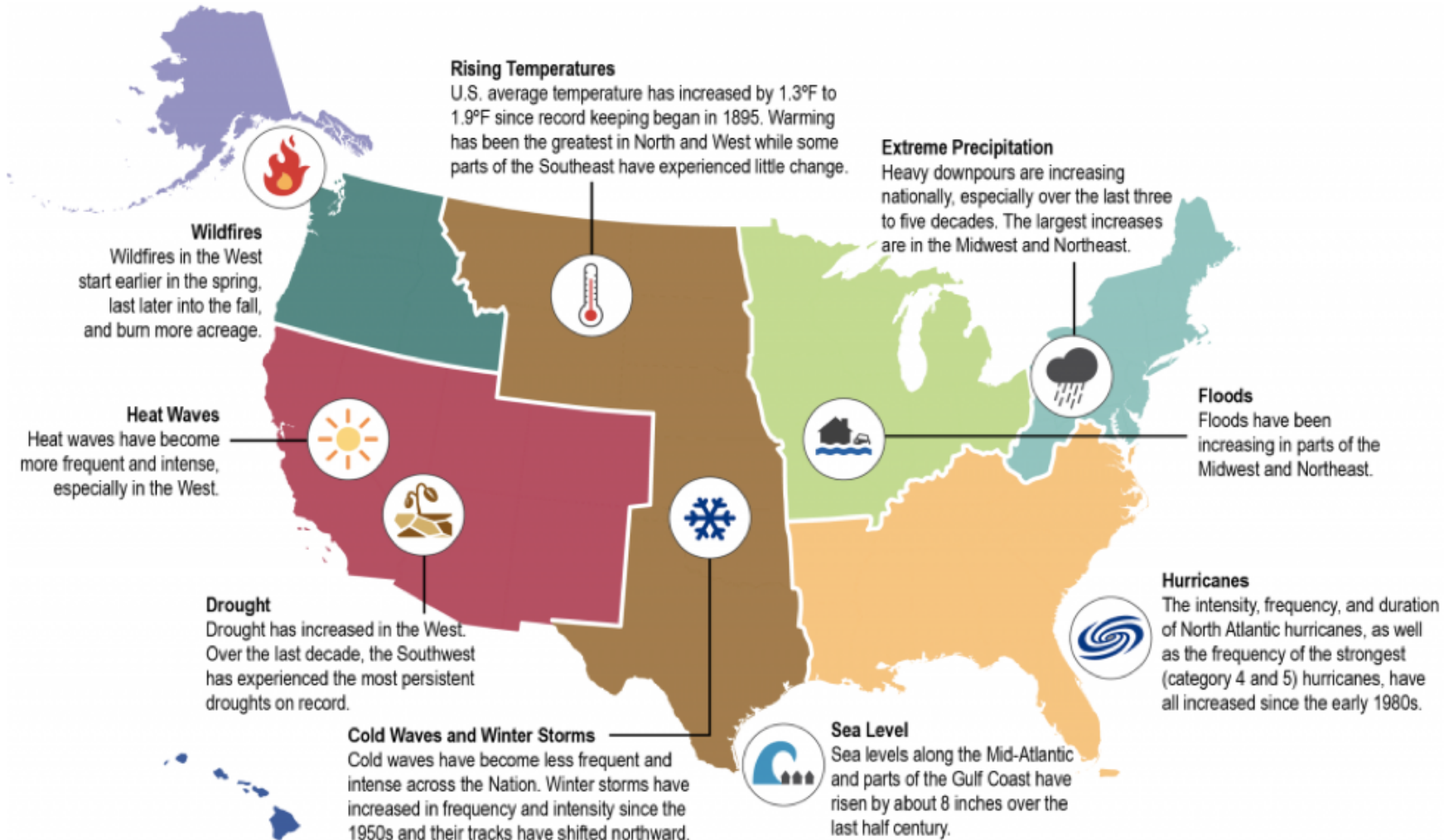
SE Virginia sea level rise scenarios







Other Trends in Severe Weather



National Climate Assessment 2017



Vulnerability of Tourism and Service Sectors

- **Tourism infrastructure is highly vulnerable due to proximity to ocean and waterways**
 - Erosion and flooding threaten coastal infrastructure
- **Many tourism activities are highly weather-dependent**
- **As hosts in the service industry, you are responsible for the safety of many people!**
 - Employees
 - Guests



Risks to Tourism and Service Sectors

- **Disruption of food and beverage supply chain for restaurants**
- **Travel disruption**
 - Guests cannot get to destination or around within destination
- **Employees in tourism and dependent sectors**
 - Unable to get to work
 - Loss of work due to closure
- **Damage repair and recovery**
- **Destination image repair**



What is Resilience?





What Can Your Business Do?

- **Comprehensive planning!**

- Strategic business plan
- Emergency preparedness plan
- Insurance planning
- Continuity of operations plan
- Communication plan

- **Collaborate!**

- Other businesses in your sector
- Tourism networks and organizations
- Emergency management officials
- Local and state officials

Thank You

bit.ly/Tourism_Resilience