

Encroaching Tides

*How Sea Level Rise and Tidal Flooding Threaten U.S.
East and Gulf Coast Communities over the Next 30 Years*



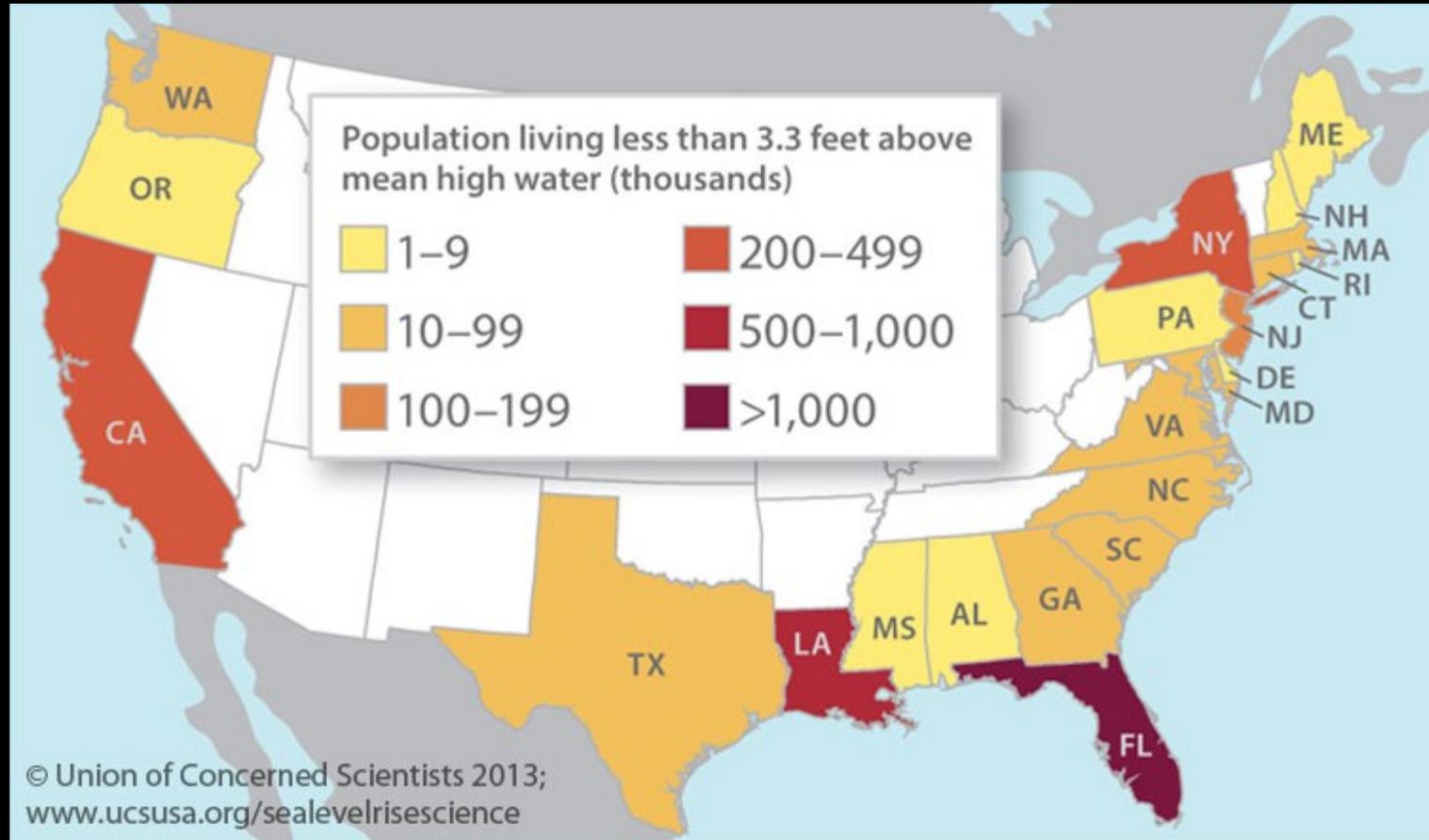
Union of
Concerned Scientists

Erika Spanger-Siegfried
Senior Analyst
Union of Concerned
Scientists

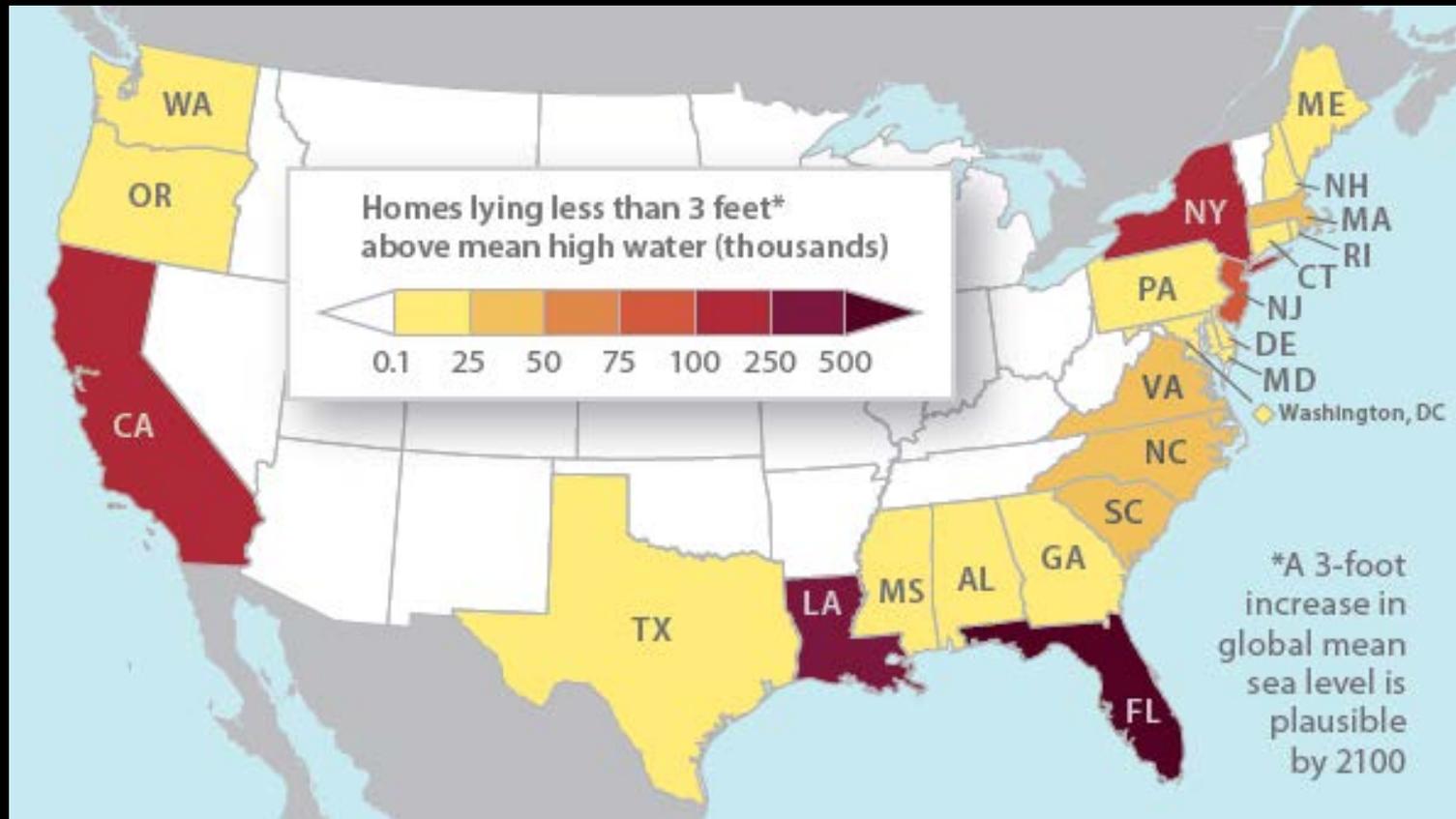
www.ucsusa.org/encroachingtides
esiegfried@ucsusa.org

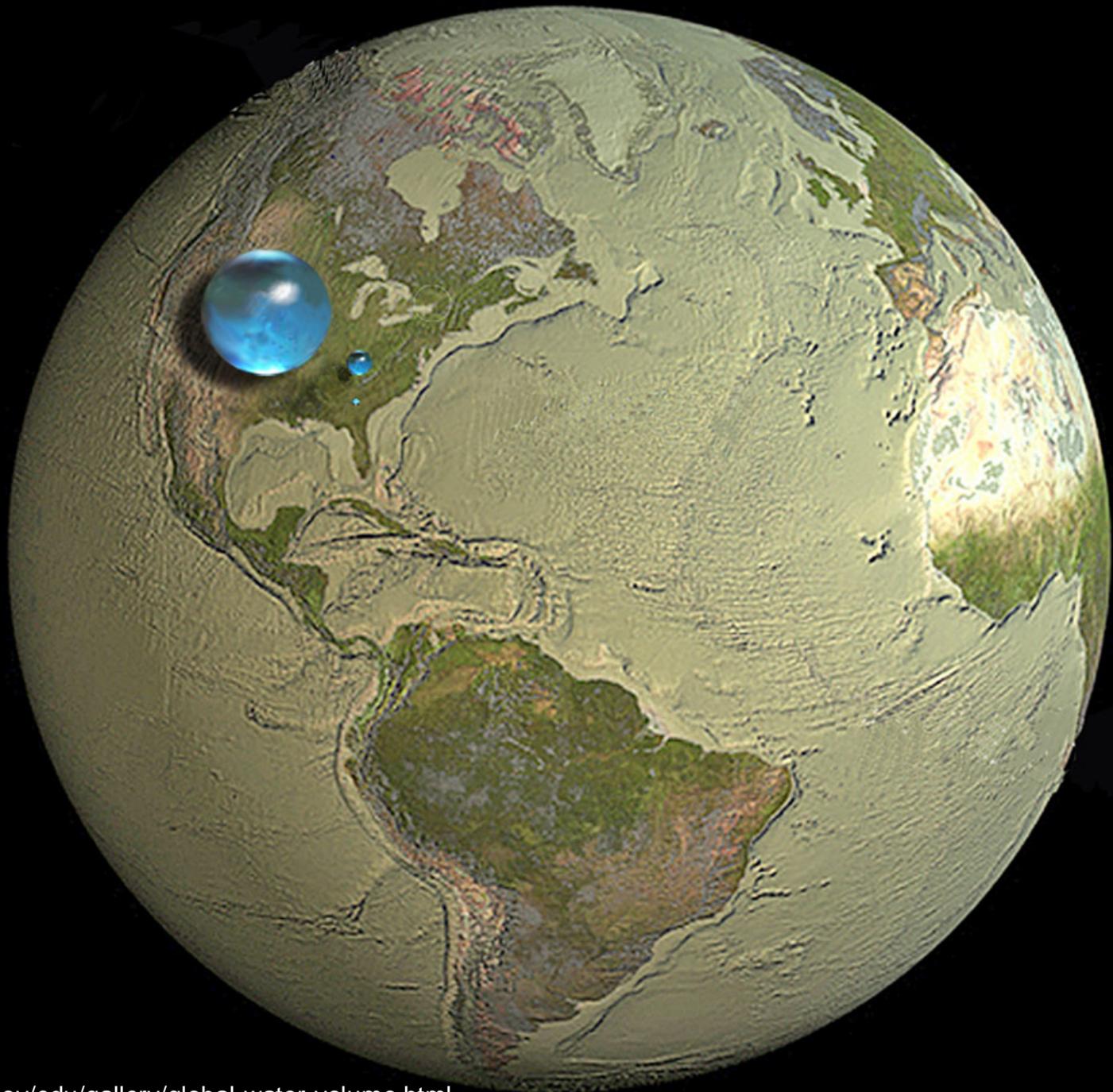


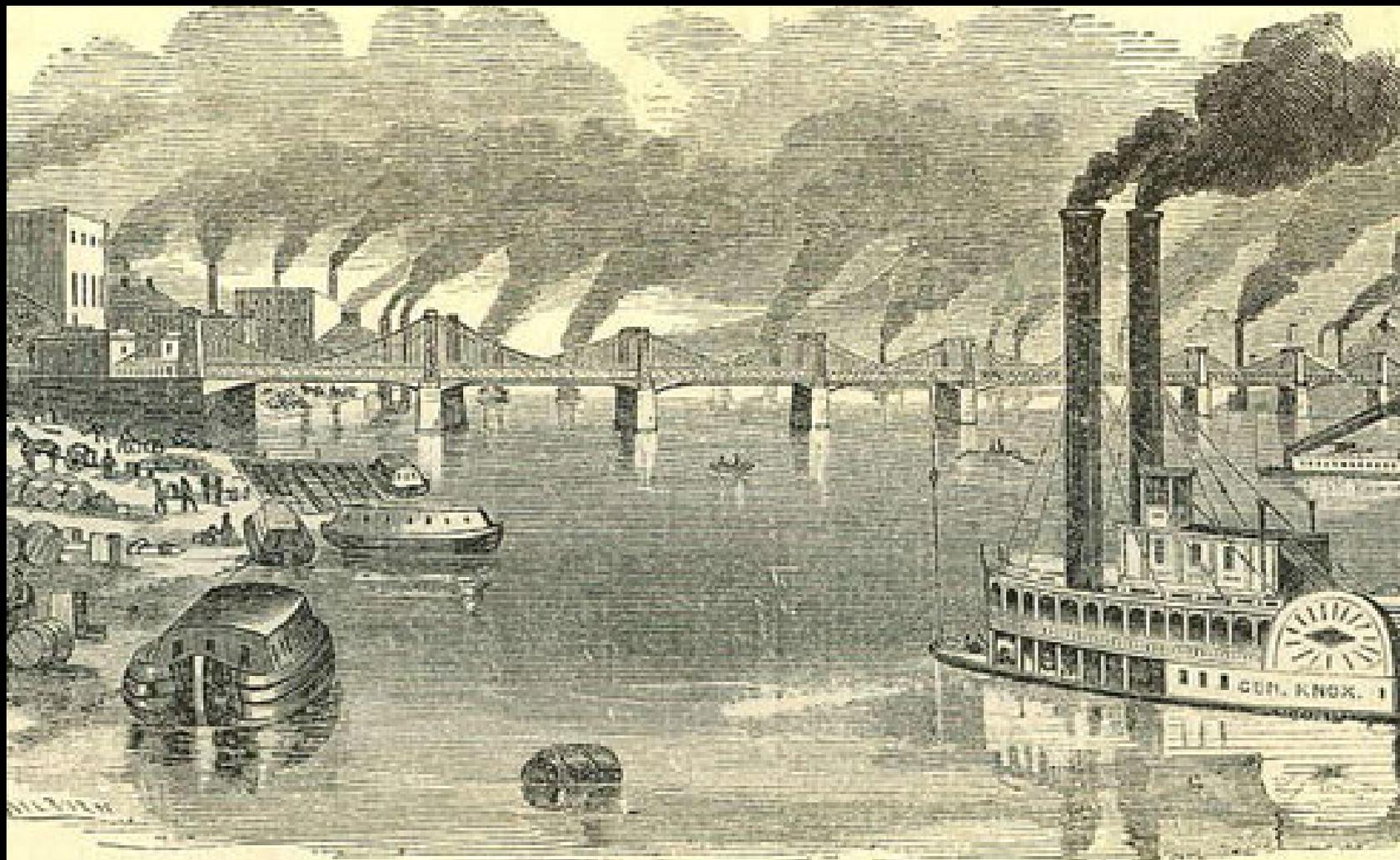
People and Property along the Coast



People and Property along the Coast



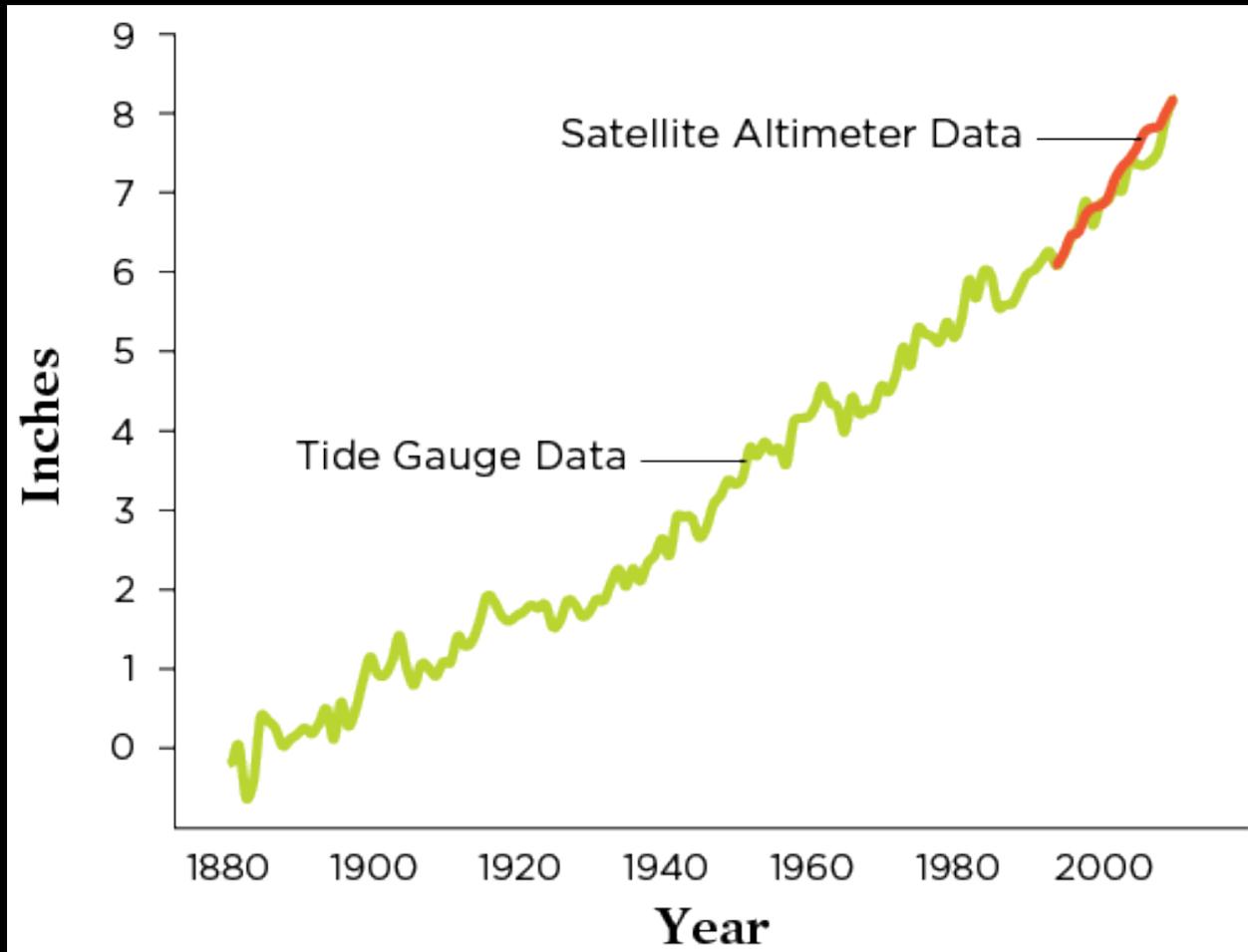




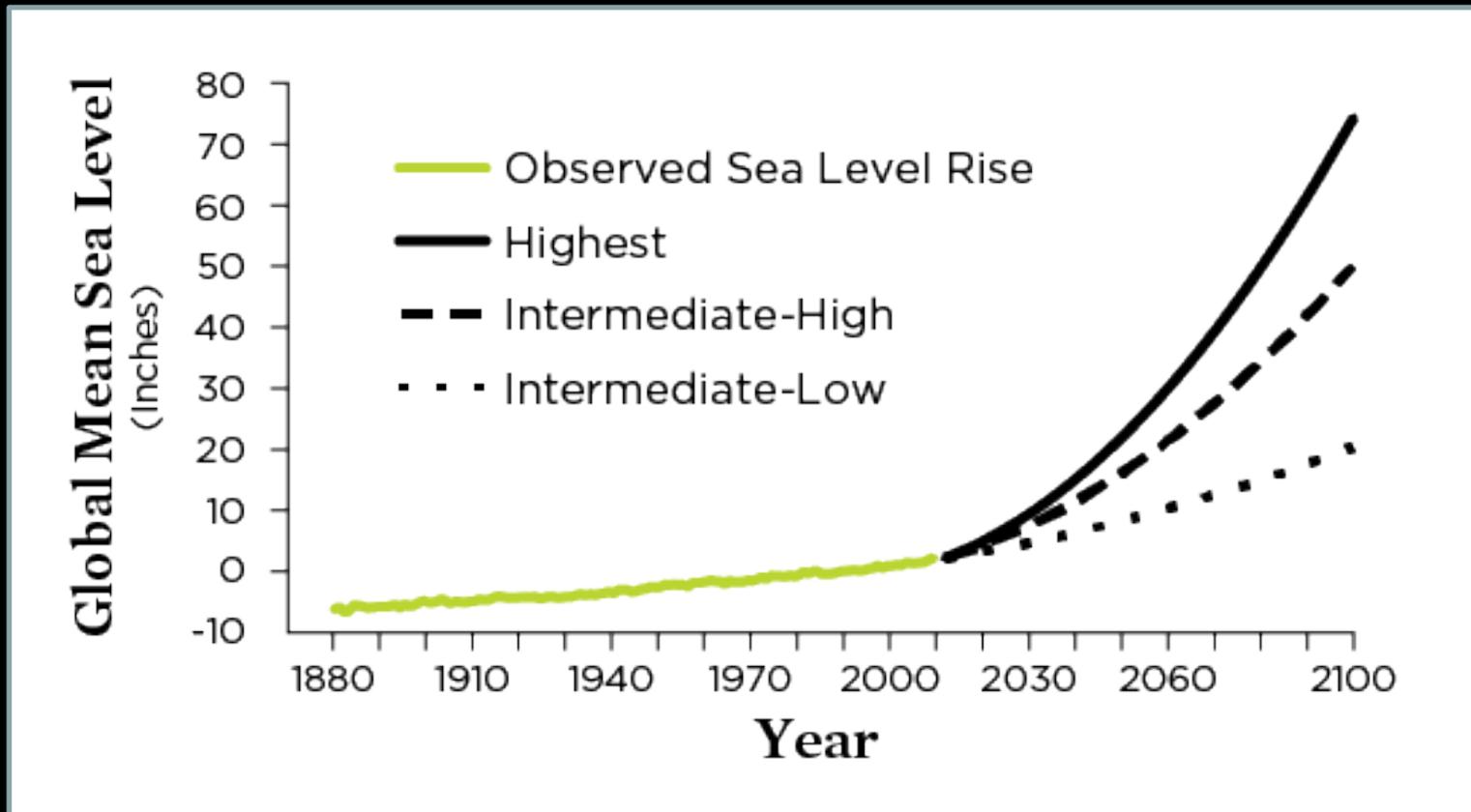
BRIDGE OVER THE MONONGAHELA RIVER, PITTSBURG, PENN.



Global sea level rise since 1880



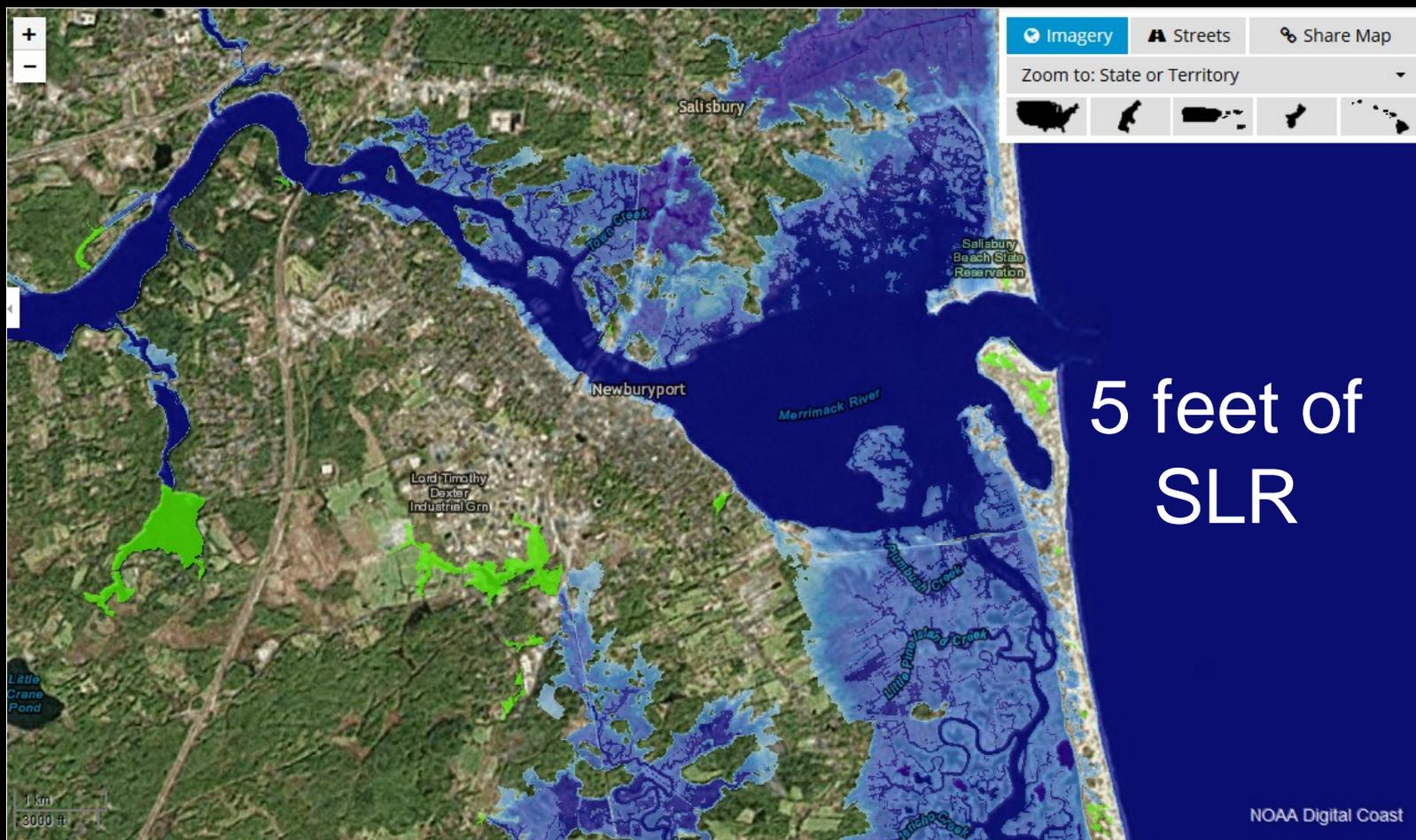
Sea Level Rise Projections



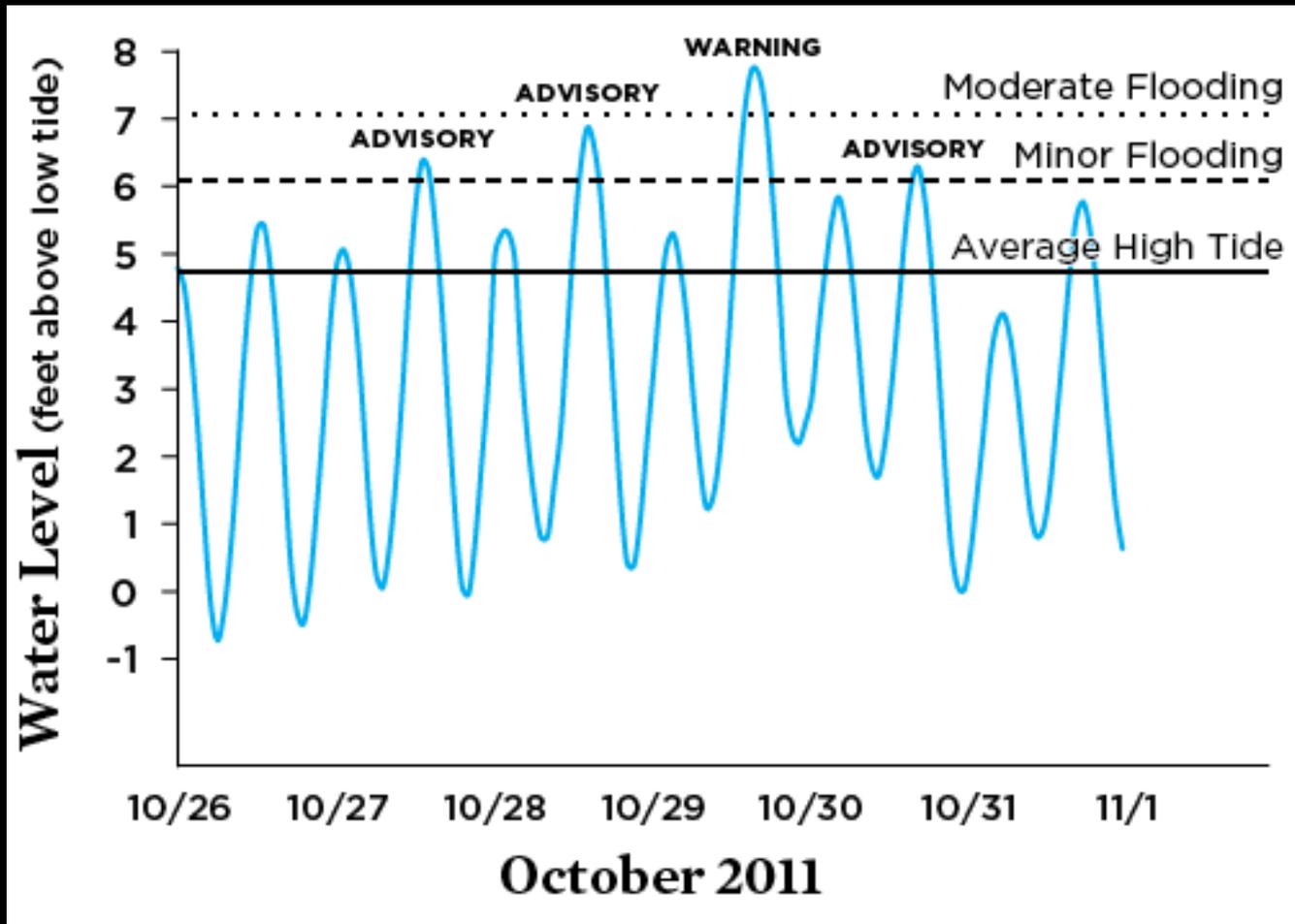
Current Risk



Longer-Term Risk



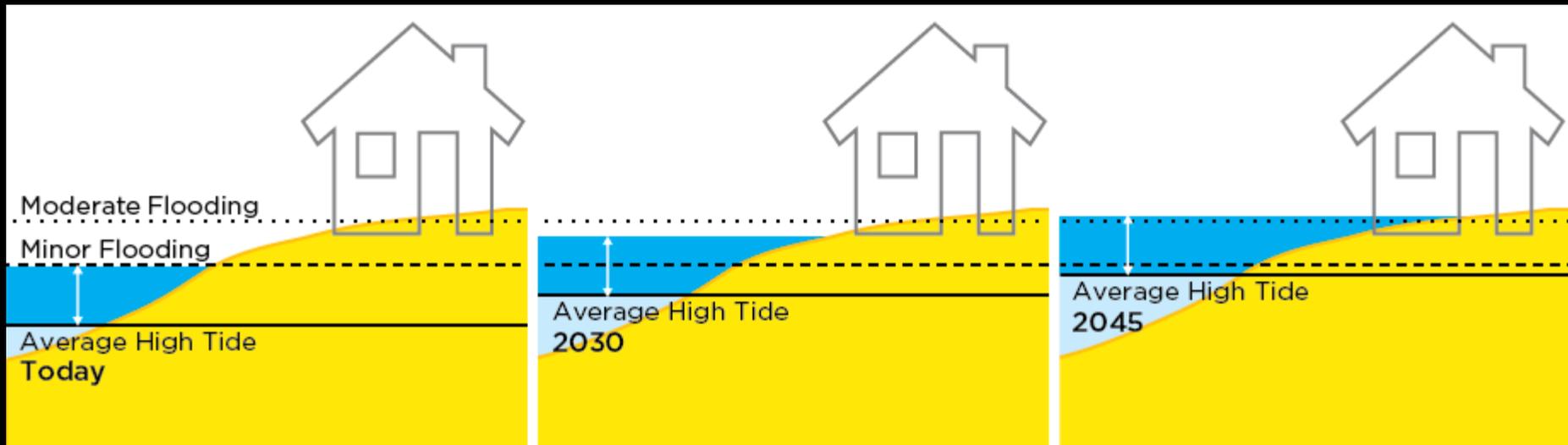
Extreme tides can = tidal floods



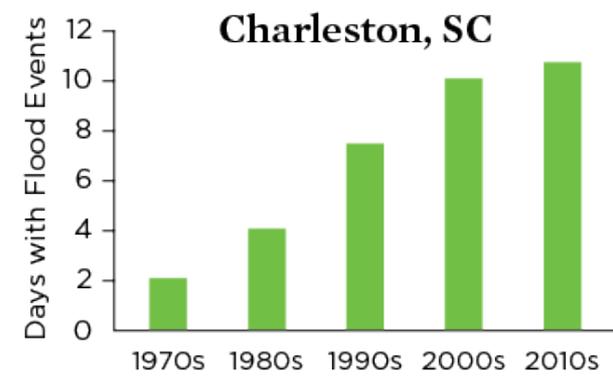
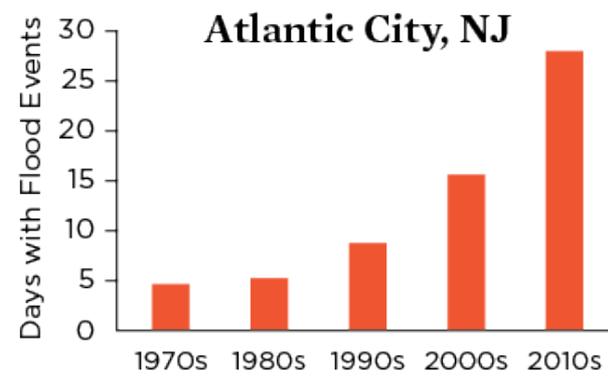
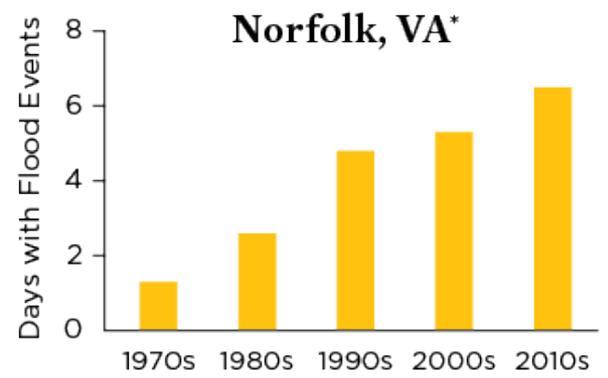
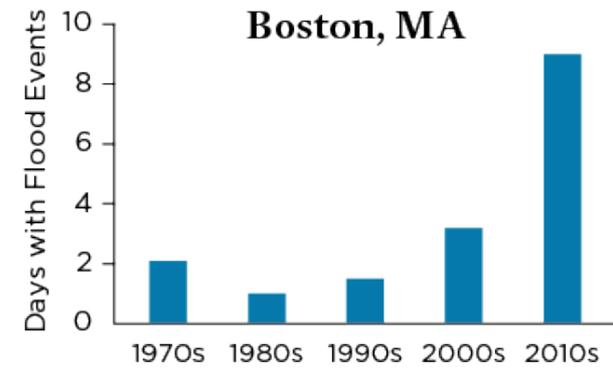
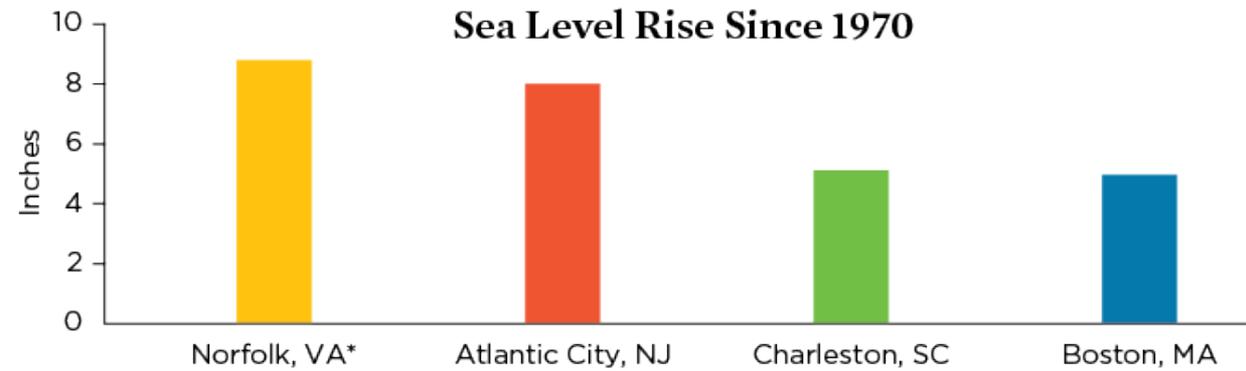


Jim Lee

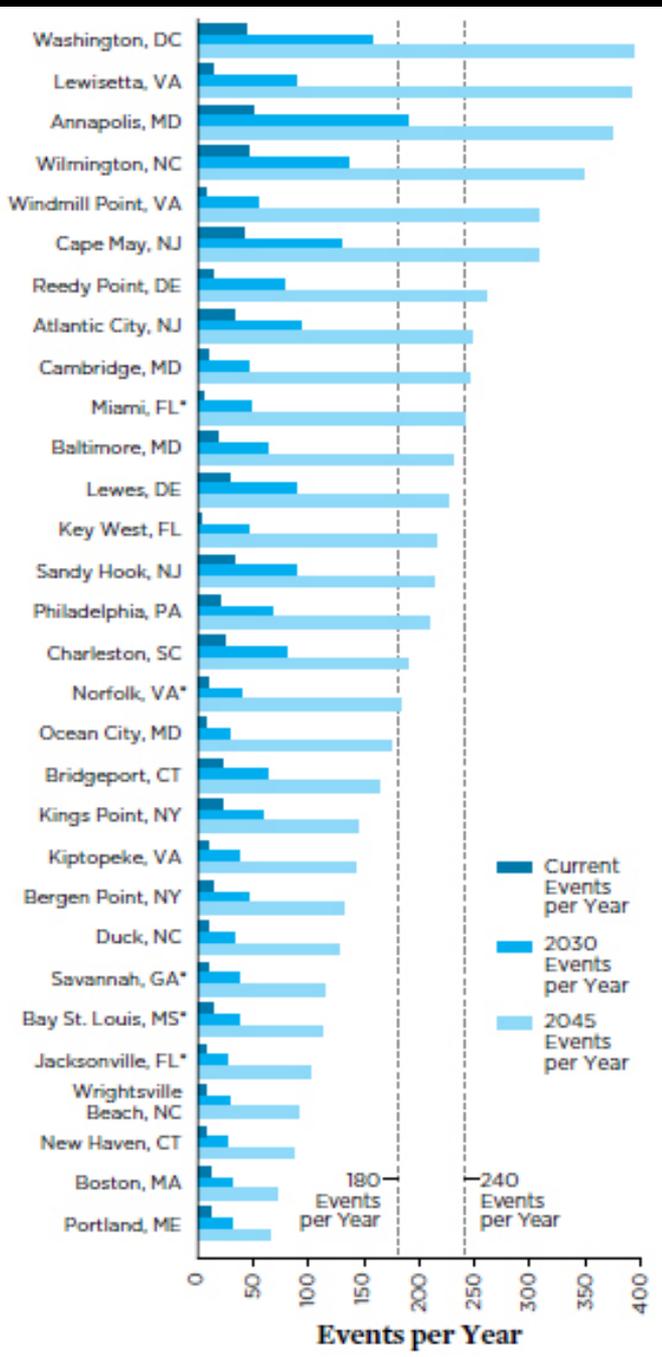
Extreme Tides + SLR = More and bigger tidal floods



Local SLR and Tidal Flooding, 1970- -2012





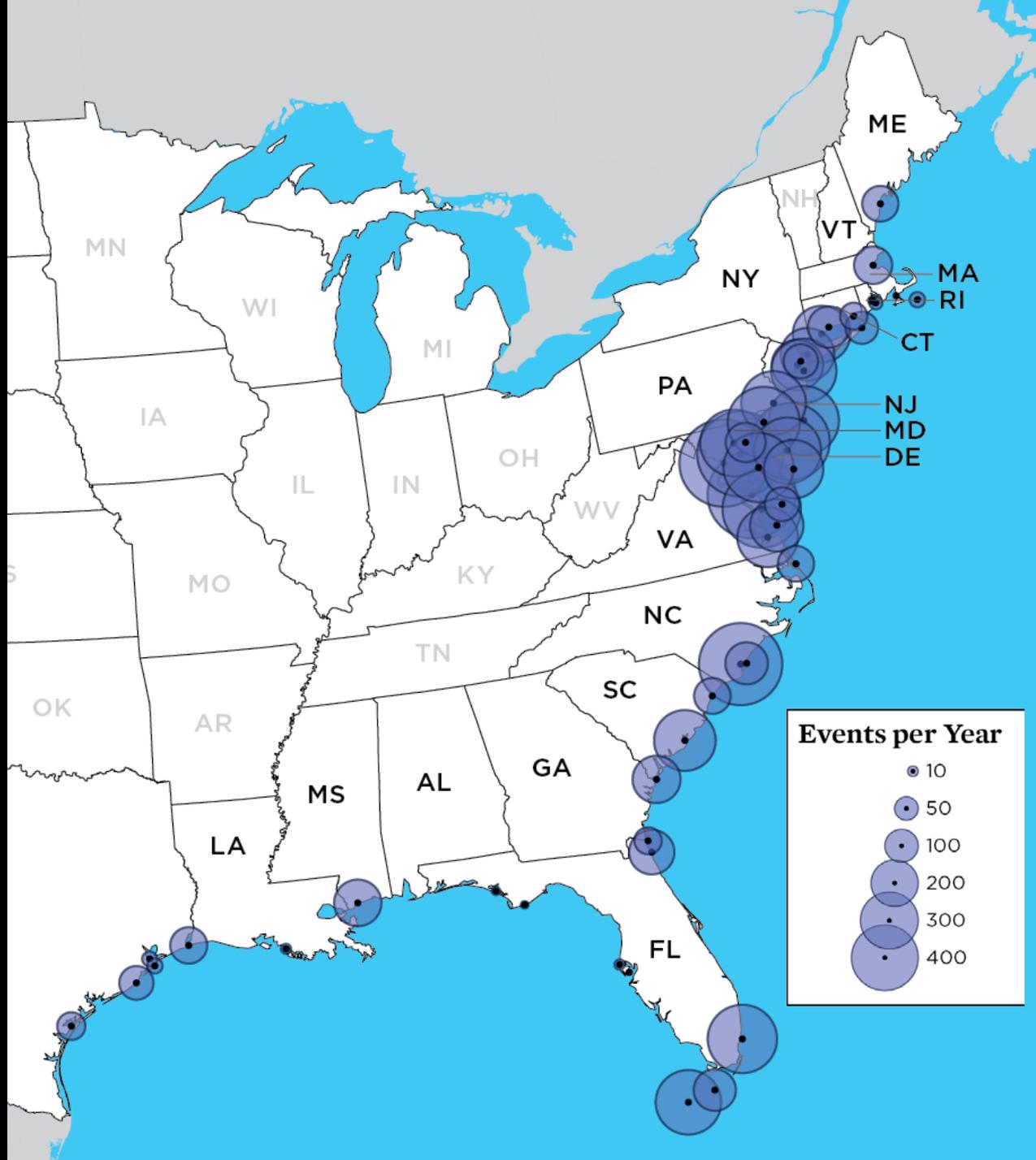


Minor flood events *per year* for the present, 2030, 2045

Expanding Reach of Tidal Flooding



Growing Frequency and Spread of Tidal Flooding

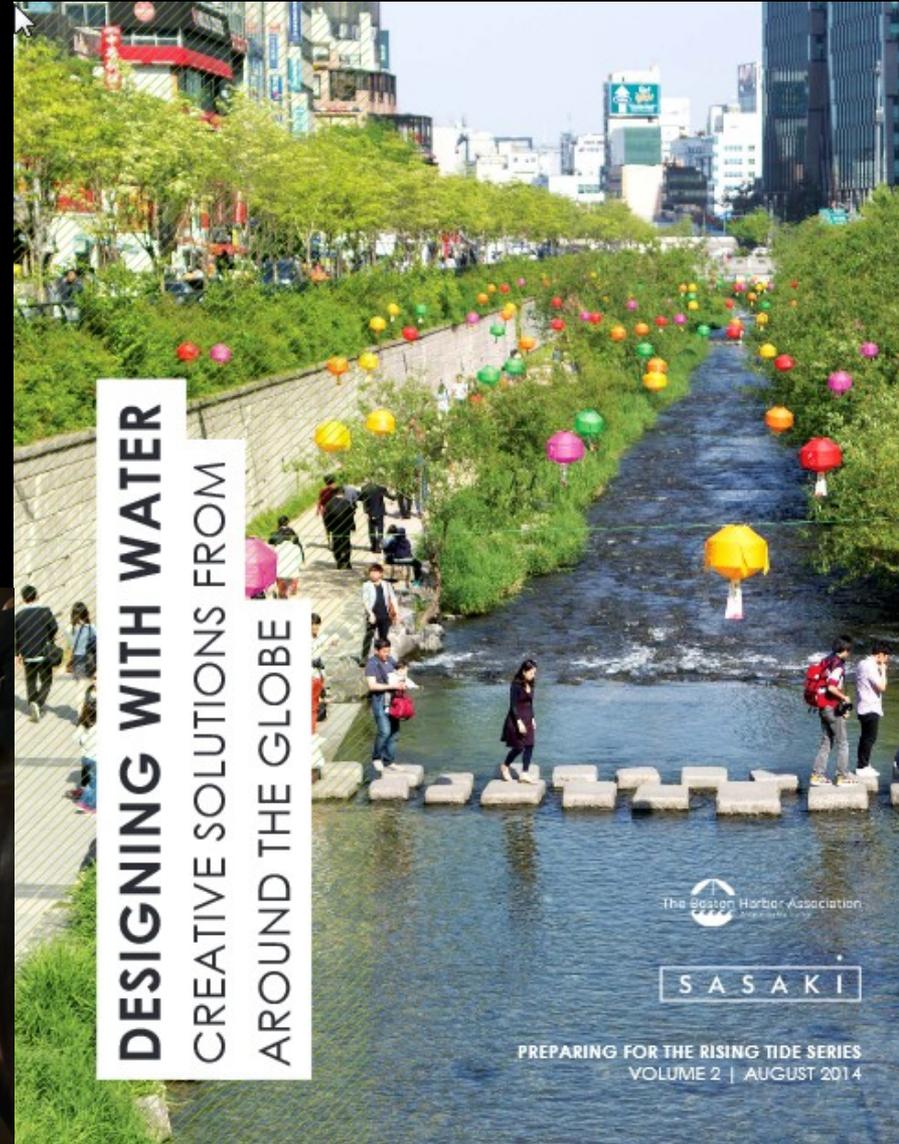




Resilience principles

Cities can...

- Upgrade the built infrastructure in harm's way.
- Avoid putting anything new in harm's way.
- Consider the risks and benefits of adaptation measures.
- Have a long-term vision.



DESIGNING WITH WATER
CREATIVE SOLUTIONS FROM
AROUND THE GLOBE

The Estuary Harbor Association
Arlingford Centre

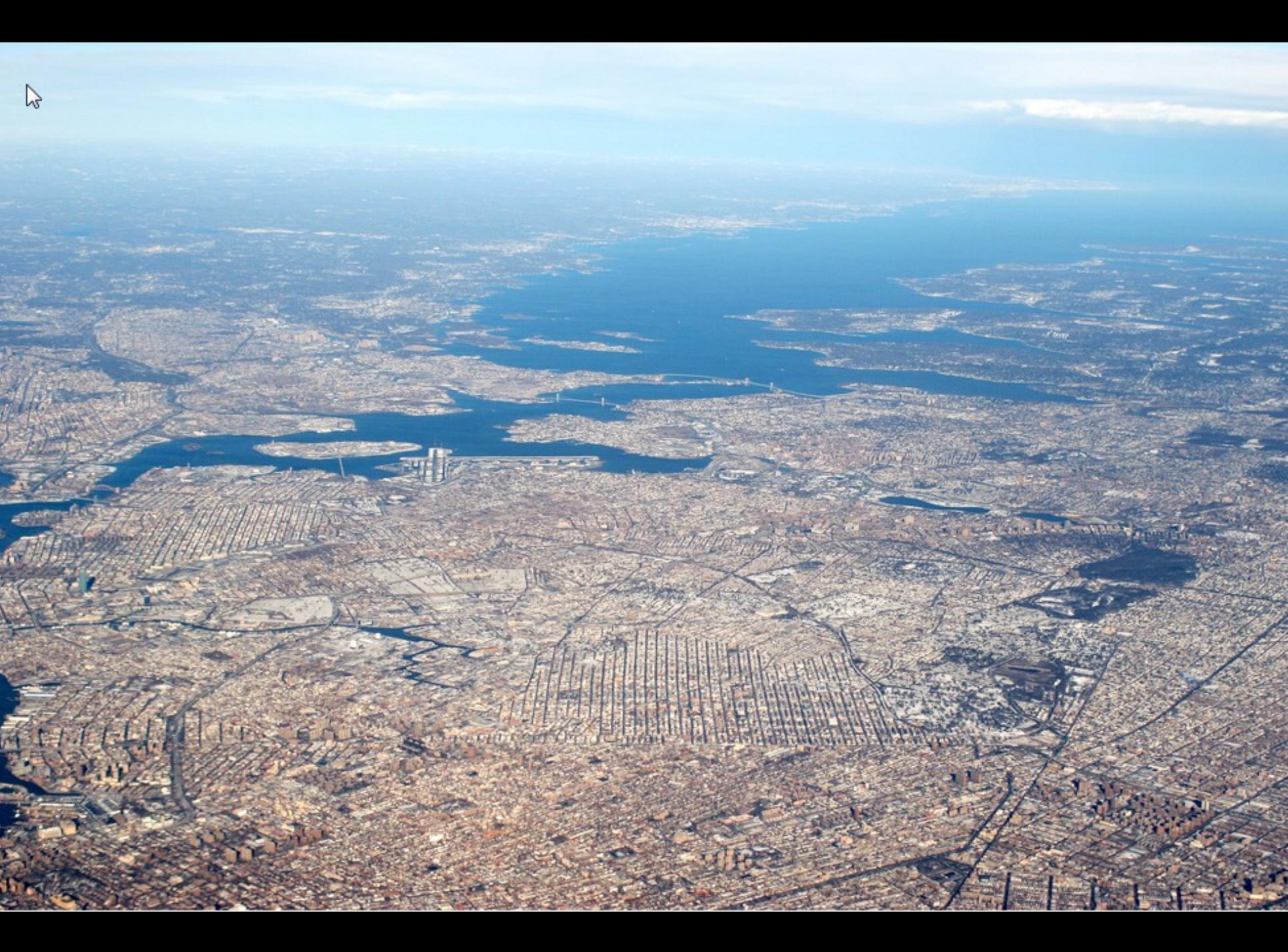
SASAKI

PREPARING FOR THE RISING TIDE SERIES
VOLUME 2 | AUGUST 2014

State and Federal Support

- Coastal monitoring and data-sharing system
- Encourage or mandate the use of good scientific information
- Support planning
- Mobilize funding
- Improve risk management
- Ensure equitable investments
- Reduce heat-trapping emissions



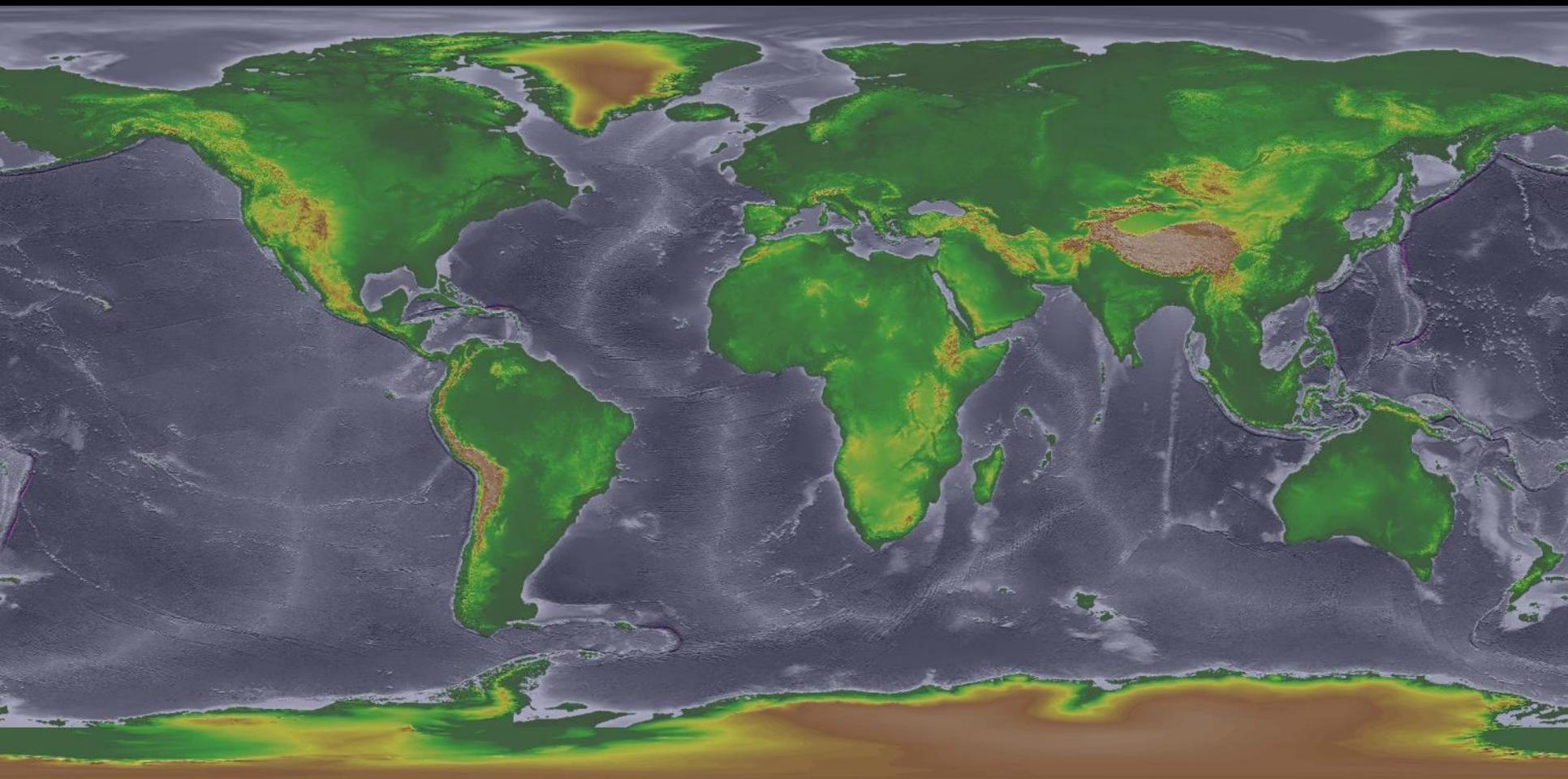




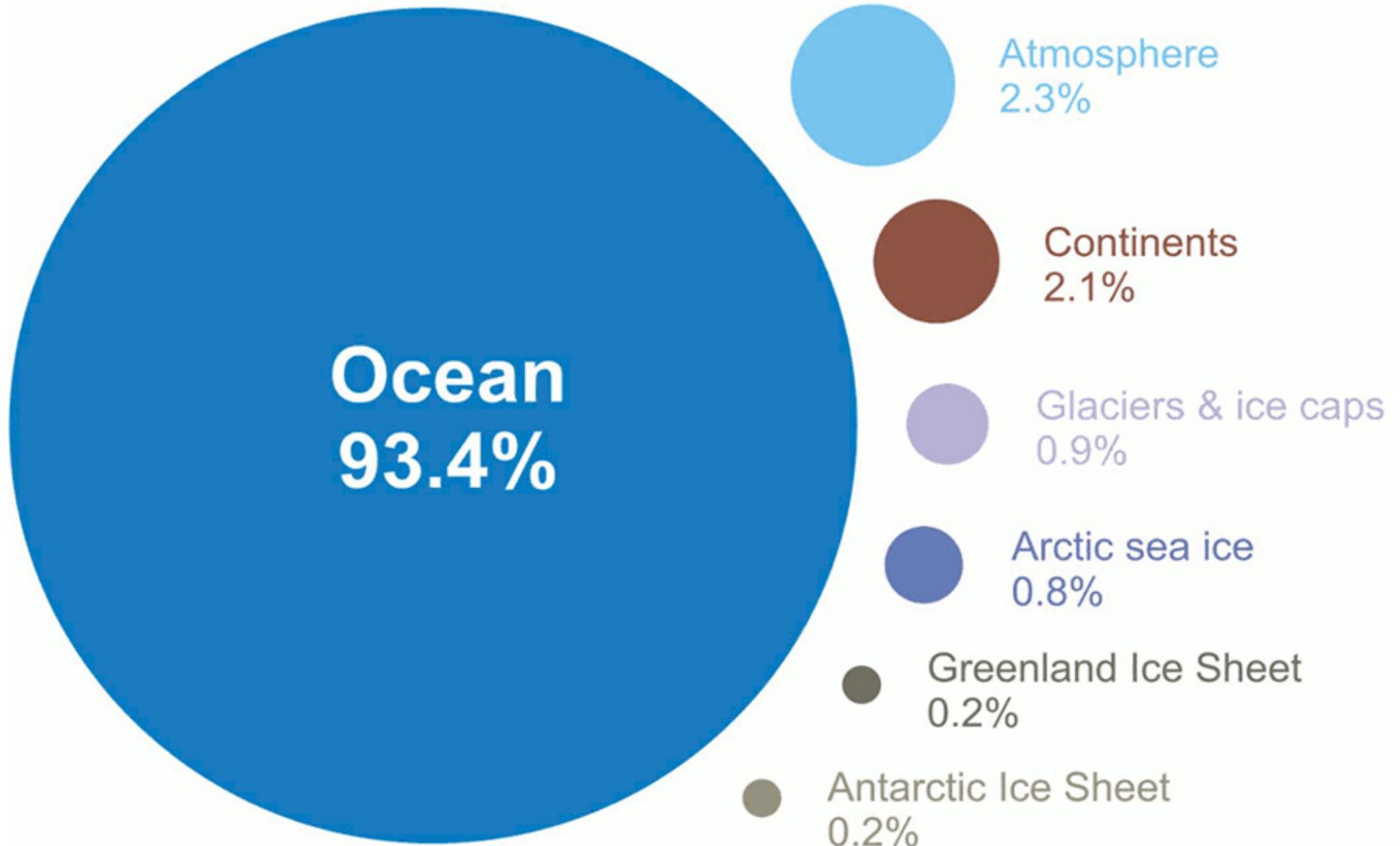
Thank You

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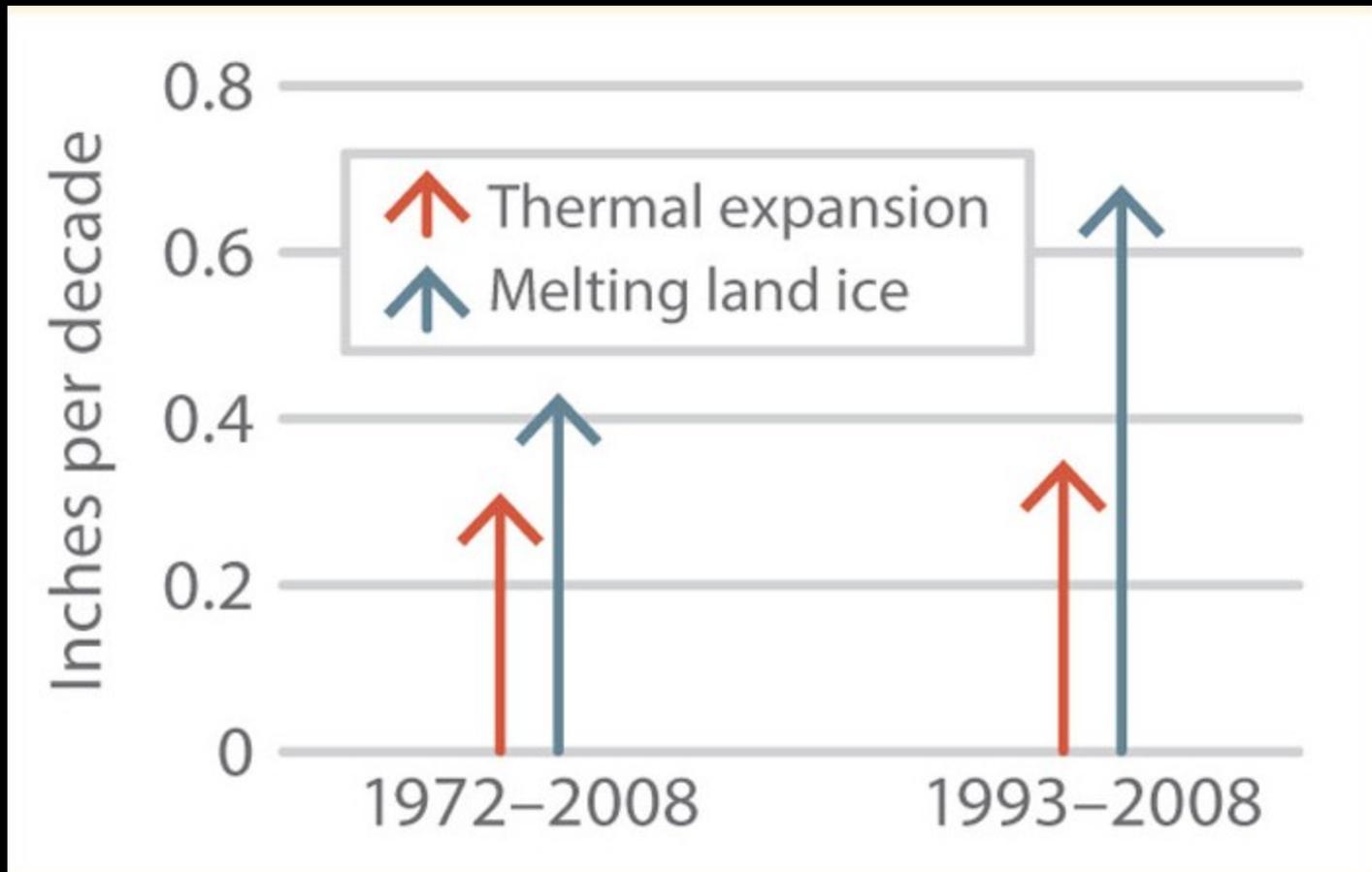
Extra slides



Where Global Warming is Going



Recent contributions to sea level rise

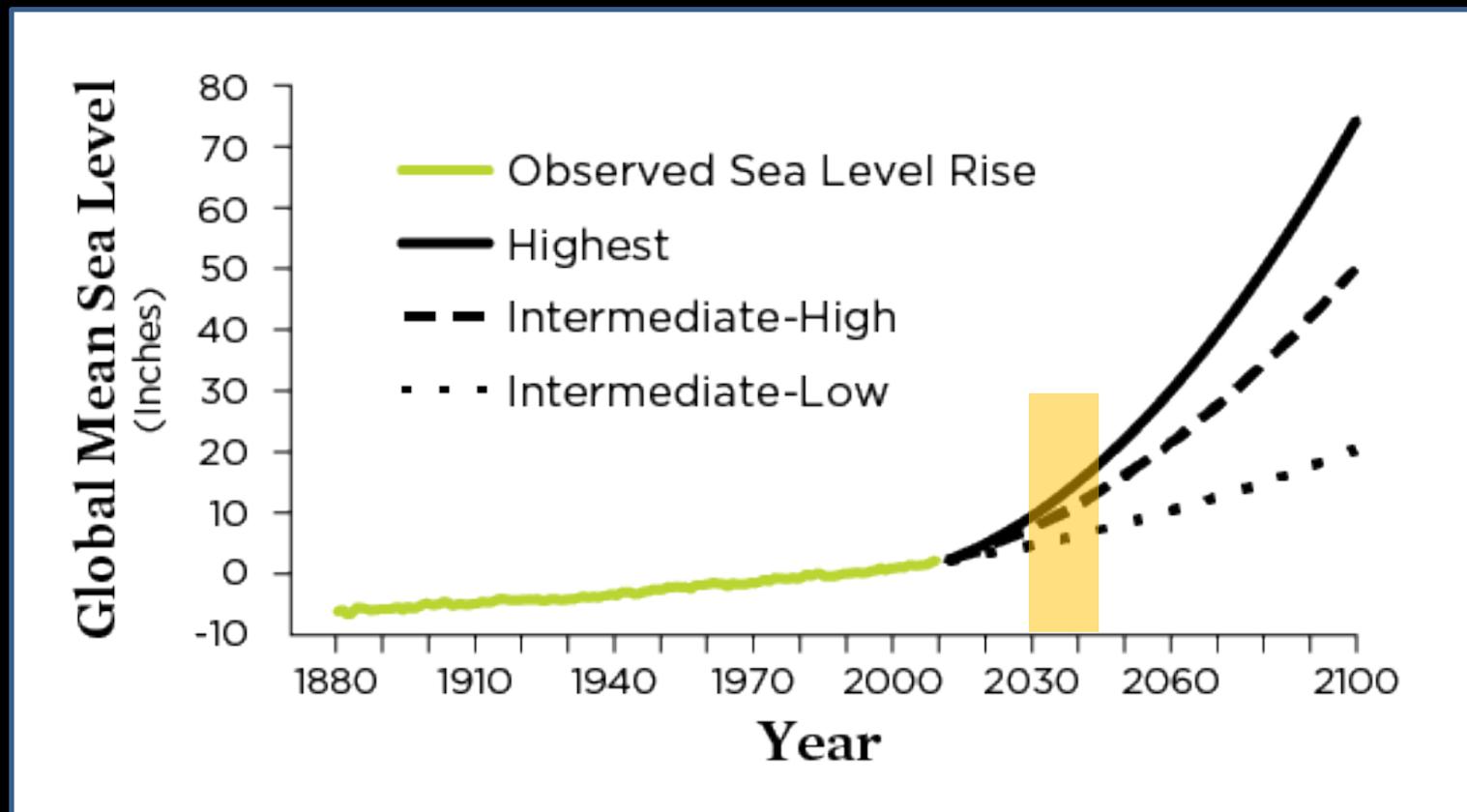


This Report....

- Looks at 52 locations on U.S. East and Gulf Coasts
- Uses local minor and moderate flooding thresholds, correlated with local flooding
- Uses localized NCA SLR projections for 2030 & 2050
- Projects the frequency and duration with which future tides exceed flooding thresholds
- Shares stories about communities' experiences



Sea Level Rise Projections



- Intermediate High Scenario from U.S. NCA
- Global sea level rise of 5 inches above 2012 levels by 2030, and about 11 inches by 2045.

Tides that Cause Minor Floods on Track to Cause Moderate Floods in Year....



\$6.6 trillion

Contribution to GDP from Coastal Shoreline Counties, just under half of U.S. GDP in 2011.

Source: NOAA stics.noaa.gov estimates of BEA GDP, 2012

51 million

Total number of jobs in Coastal Shoreline Counties of the U.S. in 2011.

Source: BLS, 2012

\$2.8 trillion

Wages paid out to employees working at establishments in Coastal Shoreline Counties in 2011.

Source: BLS, 2012

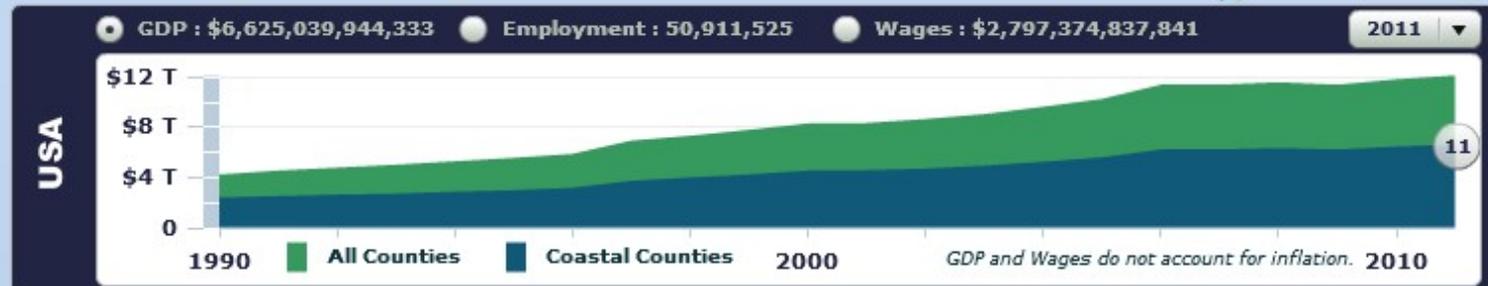
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Global GDP rank in 2011 (behind the U.S. and China) of the Coastal Shoreline Counties, if considered an individual country.

Source: BLS, 2012; World Bank, 2012

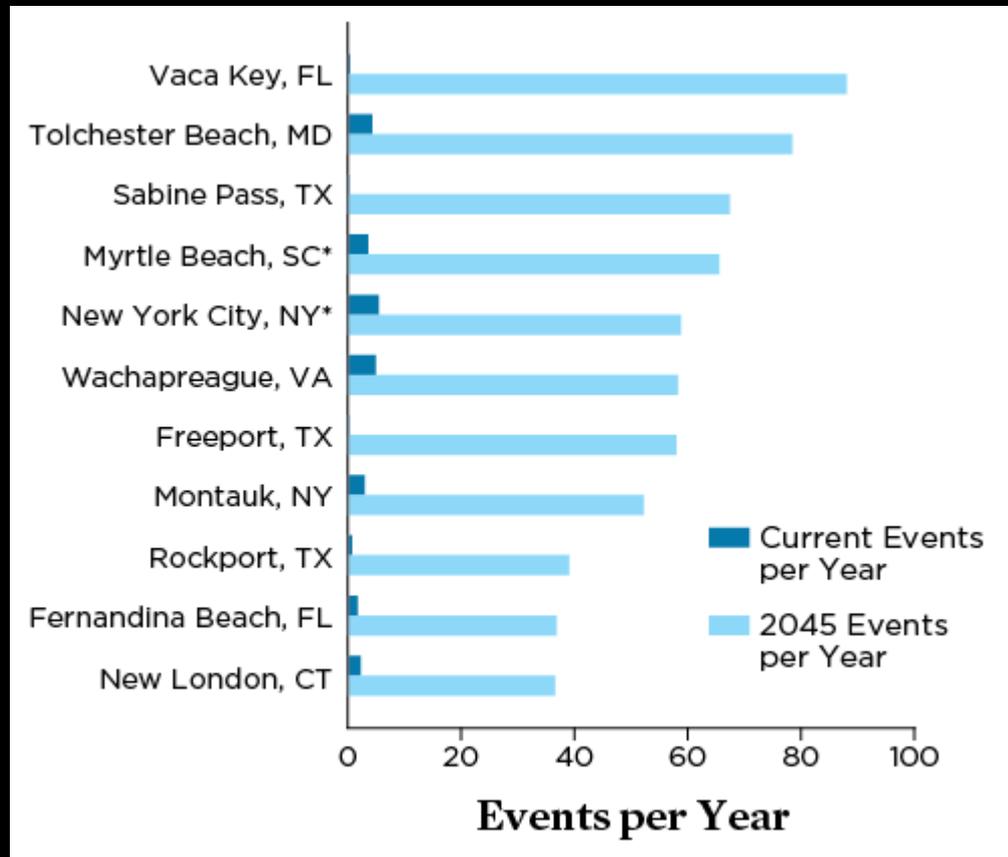
Economic Production in Coastal Shoreline Counties, 1990-2011

STATE OF THE COAST

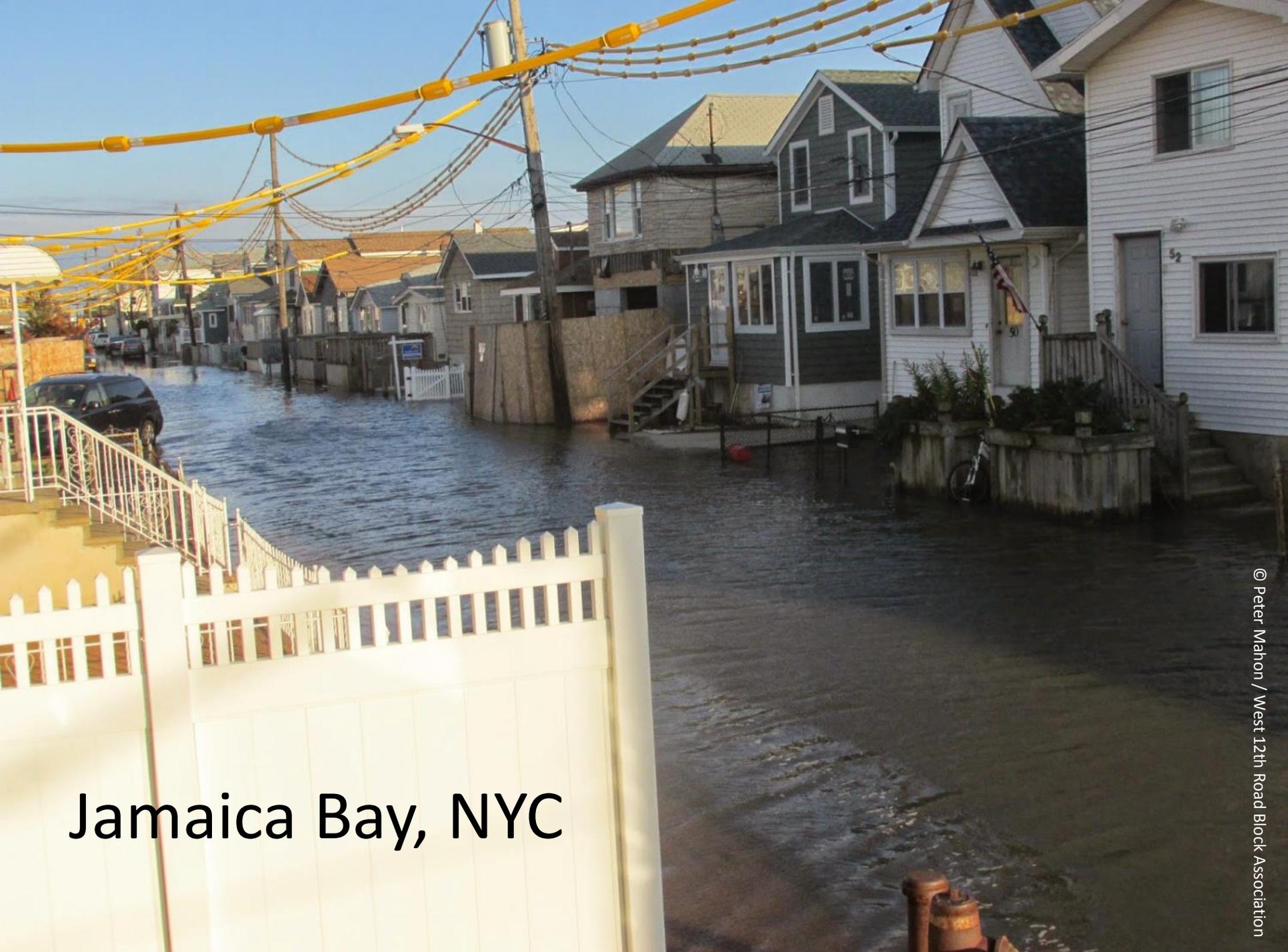


Source: BLS, 2011; NOAA stics.noaa.gov estimates of BEA GDP, 2011; BEA, 2011; Government Development Bank [Download Coastal Economy Interactive Map and Data \(1.18mb\)](#) of Puerto Rico, 2010

More Locations Join the Tidal Flooding Front Line







Jamaica Bay, NYC

- “Fifteen years ago I didn’t believe in sea level rise, but I do now. Flooding has become so common that we live by the tidal cycles in Broad Channel.”

- Dan Mundy, Sr., retired fire chief and former neighborhood association President

Annapolis MD



- "I walk [...] to lunch and I anticipate, on some high-tide days, that I'm not going to be able to walk back; I'm going to have to take the long way around."

- Lisa Craig, Chief of Historic Preservation, City of Annapolis

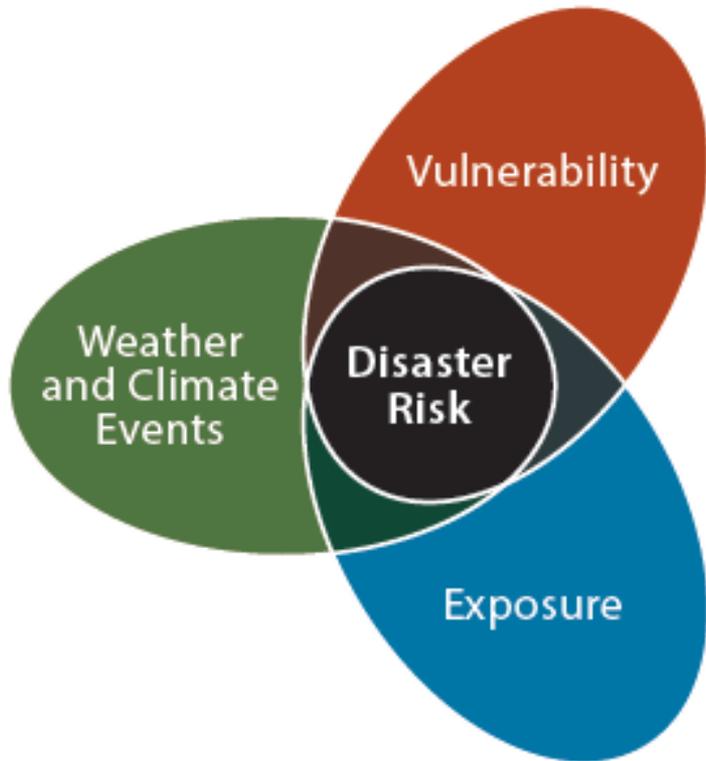
<http://www.npr.org/2014/10/08/354166982/climate-change-worsens-coastal-flooding-from-high-tides>

Savannah and Tybee Island, GA



- “Now is the time to plan and budget for infrastructure that we’ll need 20, 50, and 100 years from now to deal with the impacts of sea level rise.”
- - Paul Wolff, Tybee Island’s longest-sitting city council member

Coastal Communities at Risk



- Increasing coastal populations
- Increasing coastal development
- Climate factors