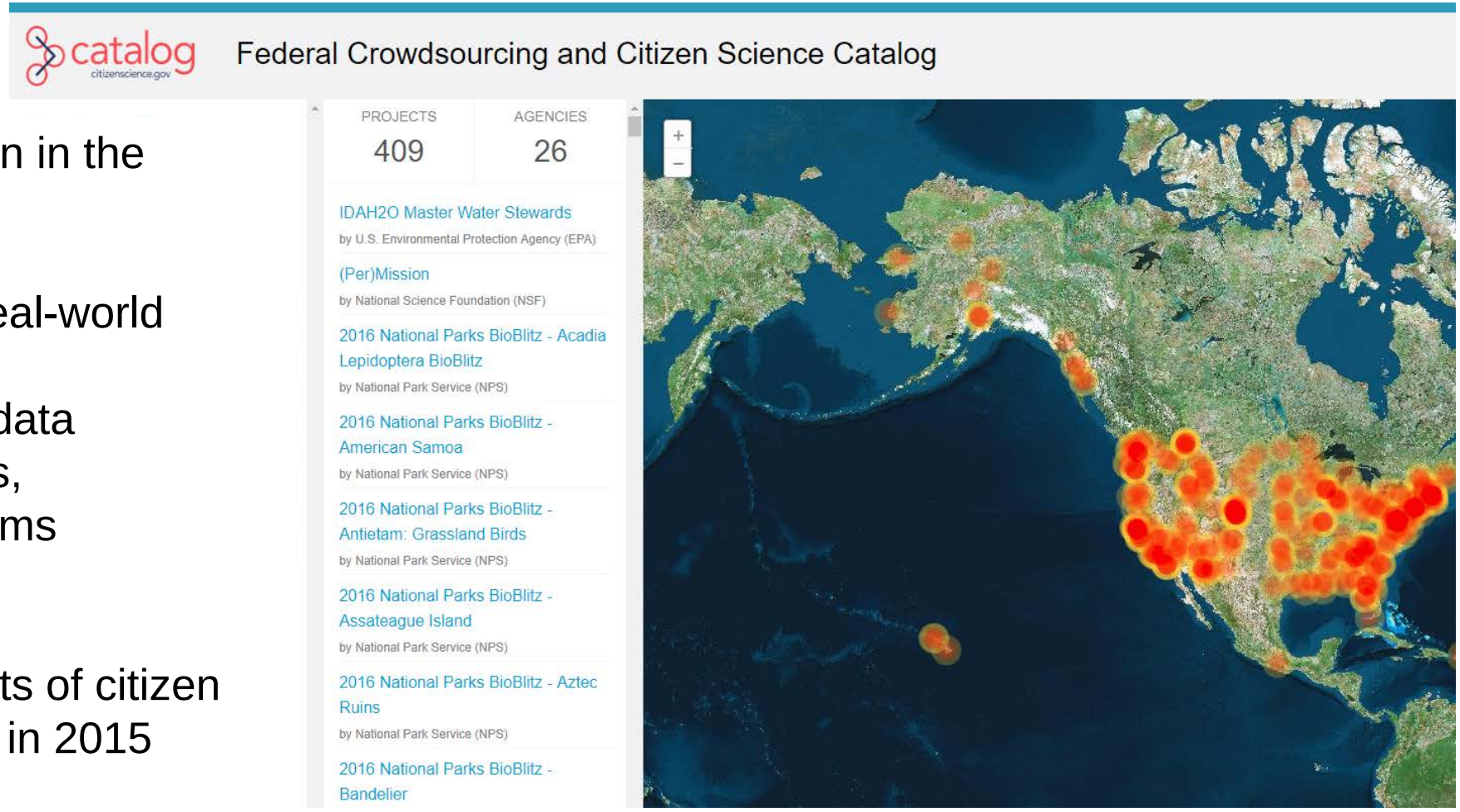
Recording Water Levels Through Citizen Science Reporting

Christine Buckel, NOAA/NOS/NCCOS – Christine.Addison@noaa.gov 12/2017

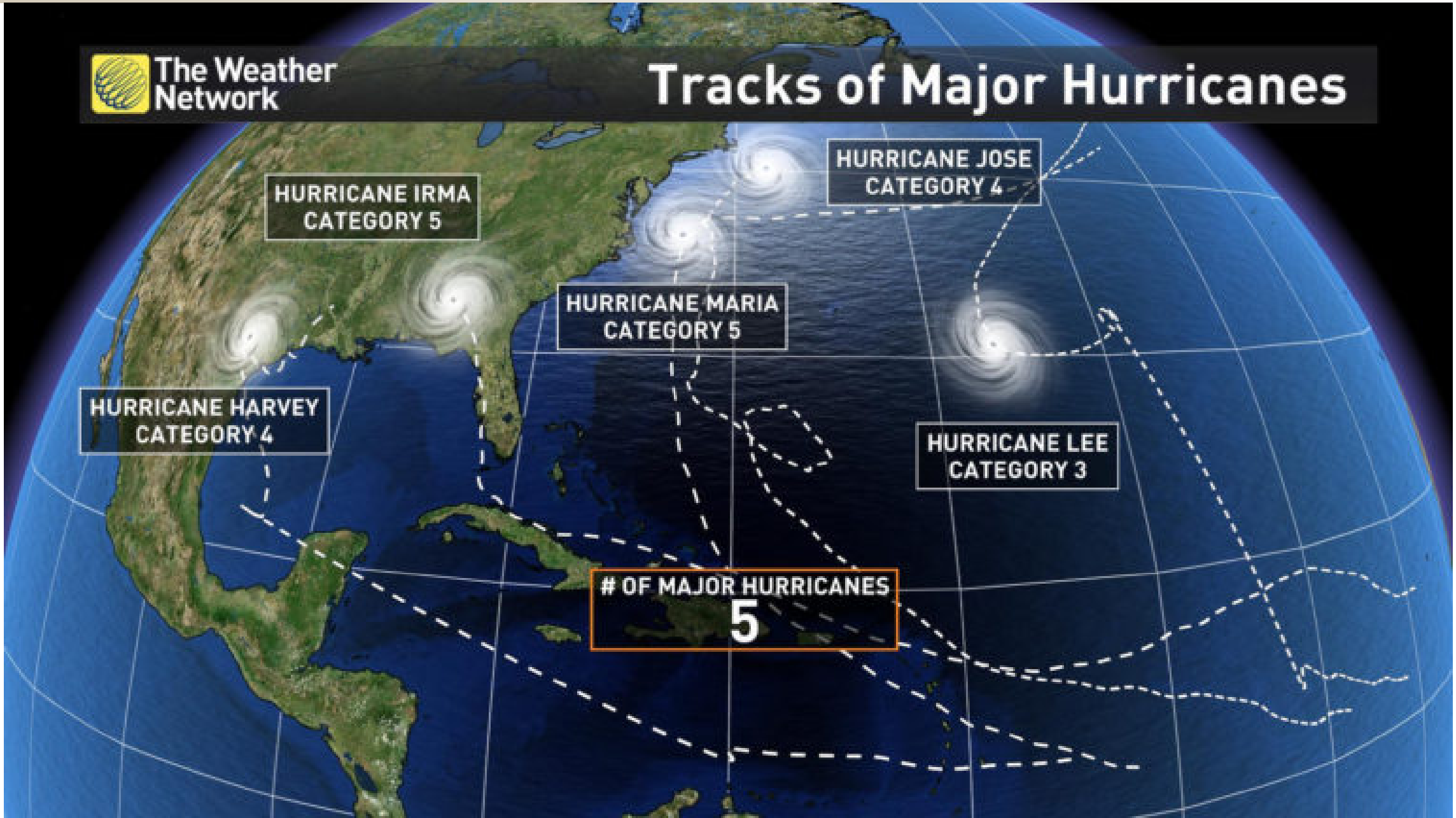
Citizen Science and Crowdsourcing

- Voluntary public participation in the scientific process
- Participants help address real-world problems by
  - Collecting & analyzing data
  - Making new discoveries,
  - Solving complex problems
- US Gov't recognized benefits of citizen science and crowdsourcing in 2015 memorandum



www.citizenscience.gov

Elevated water levels – hurricanes and storm surge



Elevated water levels - Globally

It's not just Harvey: August marked by deadly floods around world

By Madison Park, CNN

Updated 5:50 AM ET, Fri September 1, 2017

Source: CNN

Elevated water levels – High Tide Floods, Nuisance Flooding, and King Tides

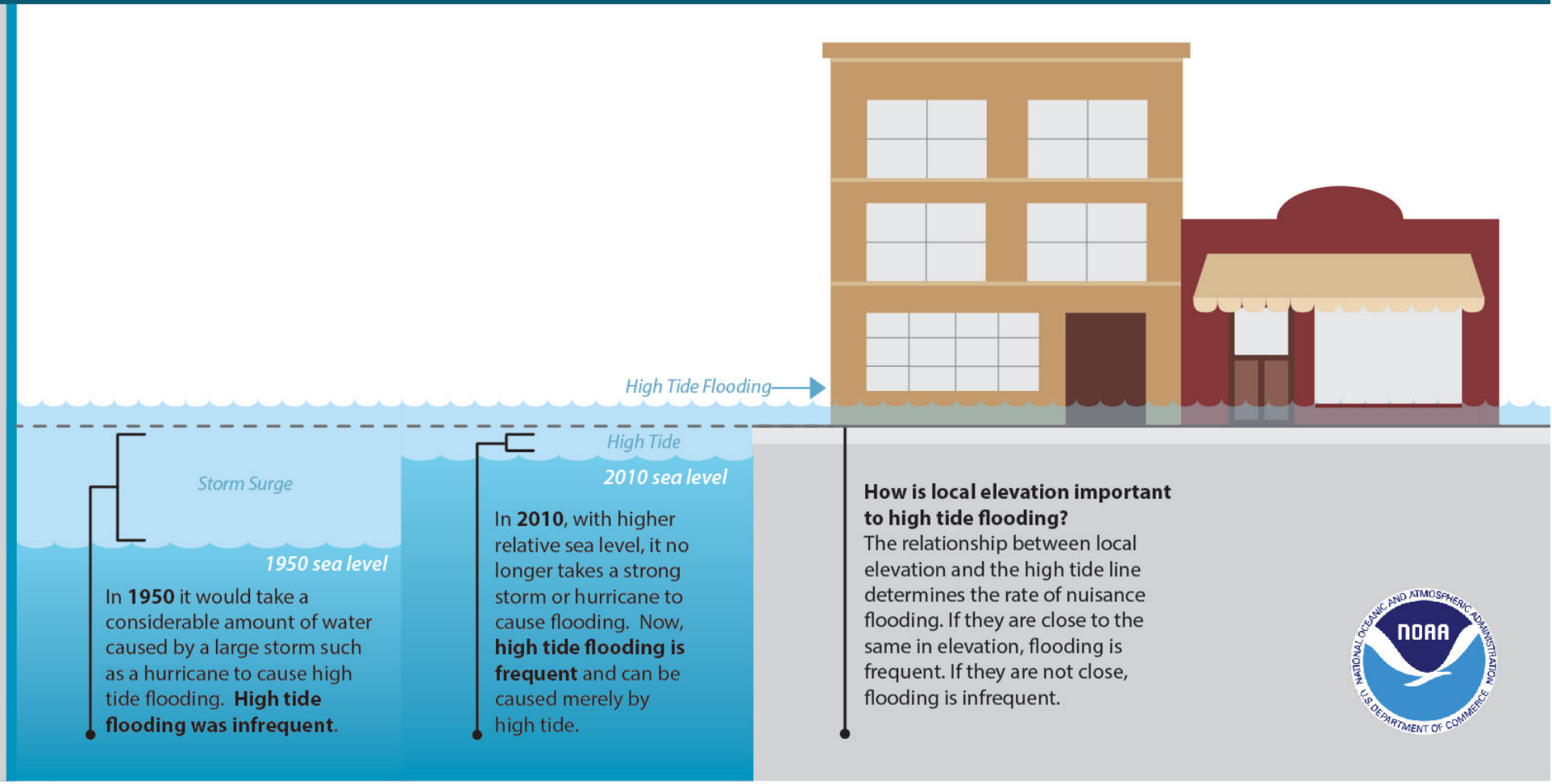
High Tide Flood Events Are Significantly Increasing Around the U.S.

What is high tide flooding?
Flooding which causes public inconvenience.

What are the impacts of high tide flooding?
Frequent road closures, overwhelmed storm drains, and deterioration of infrastructure such as roads and rail.

Where is this happening?
High tide flooding is increasing around the coastal U.S., with more rapid acceleration along the East and Gulf Coasts.

Why is this happening?
High tide flooding is increasing due to climate-related sea level rise and land subsidence (sinking) combined with loss of natural coastal barriers.



Collecting high water levels – King Tides

NOAA Office for Coastal Management

The King Tides Project: Snap the Shore, See the Future

More than half of the world's population lives in coastal areas. Over one trillion dollars' worth of private property, public infrastructure, and businesses are at risk from rising seas caused by climate change (WWF and Allianz 2009). Coastal communities from Baja California to Bristol and Bangladesh are beginning to plan for a future with higher seas, and the King Tides Project is a part of many of these efforts. This project is an easy way for everyday citizens to get a glimpse of this future, while at the same time helping researchers and planners protect lives, homes, and businesses.

Explore this interactive story map to learn more about how the King Tides Project is weaving together some of the most exciting trends in citizen science, digital storytelling, and community mapping.

What is Sea Level Rise?

Just as the surface of the Earth is not flat, the surface of the ocean is not flat. For instance, the absolute water level height is higher along the West Coast of the United States than the East Coast. The surface of the sea changes at different rates around the globe.

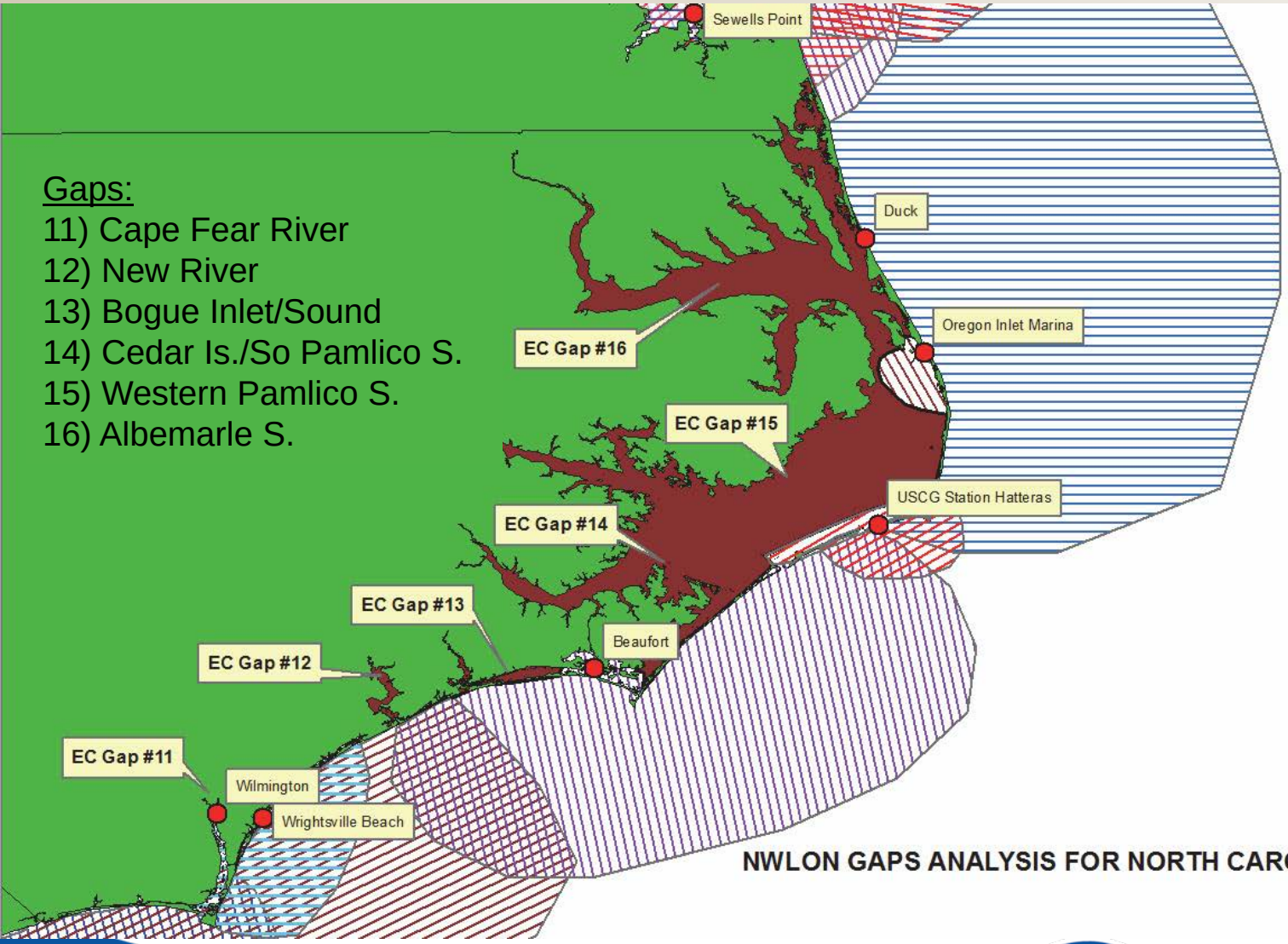
The term "global sea level" refers to the average height of all of the Earth's ocean basins. "Global sea level rise" refers to the increase in the average global sea level trend. "Local sea level" refers to the height of the water measured along the coast relative to a specific point on land. Tide stations measure local sea level. "Relative sea level trends" reflect changes in local sea level over time. This relative change is the one most critical for many coastal applications, including coastal mapping, marine boundary delineation, coastal zone management, coastal engineering, sustainable habitat restoration design, and the general public enjoying

Demonstration of “What’s your water level?”

Interactive Map – summary data and other websites to learn more:
https://noaa.maps.arcgis.com/apps/MapSeries/index.html?appid=8e4a278576964f47b4fc050e51f344ca

Report – make a report on mobile device or computer:
https://noaa.maps.arcgis.com/apps/GeoForm/index.html?appid=3b55f51105d64d5895f252374e7c902a

Data users and application – University of North Carolina



Gaps:
11) Cape Fear River
12) New River
13) Bogue Inlet/Sound
14) Cedar Is./So Pamlico S.
15) Western Pamlico S.
16) Albemarle S.

1. King Tides
   (education & outreach)

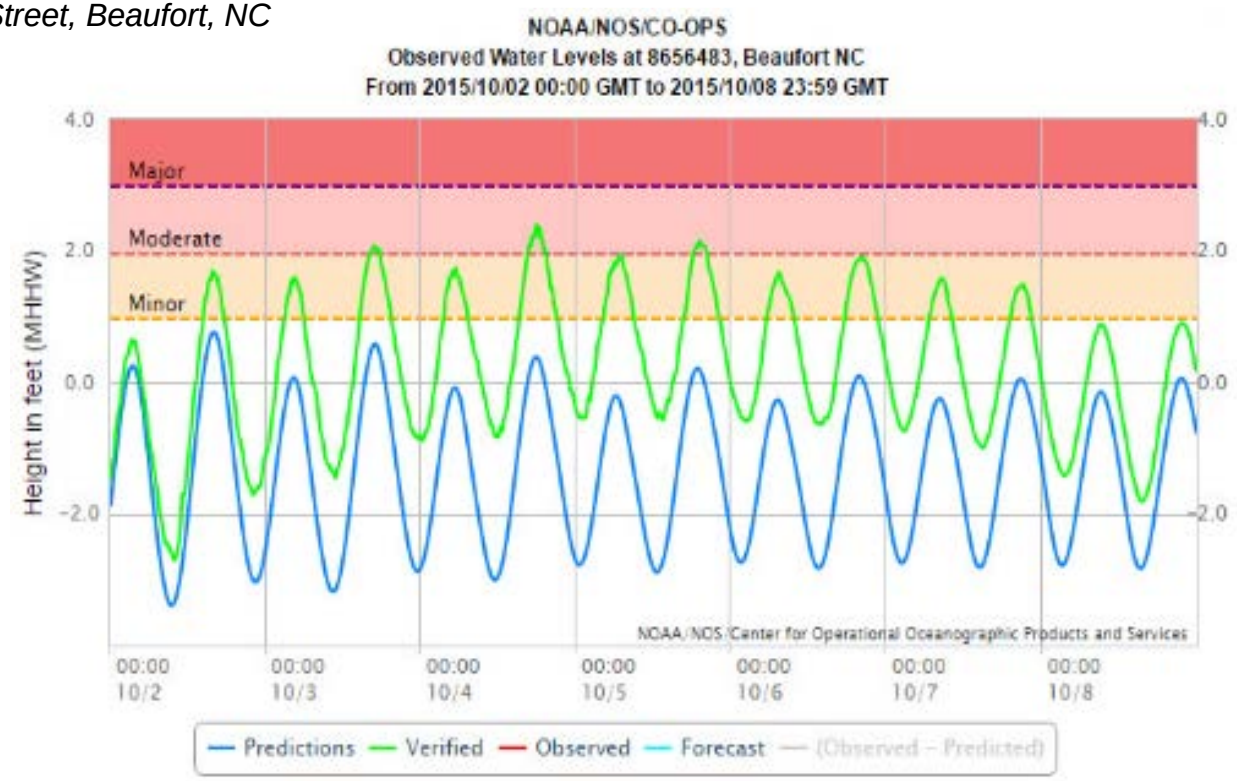
2. Cit. Sci. Water-Level Monitoring
   (NC Sea Grant & CISA)

http://nckingtides.web.unc.edu/

Data users and application – NOAA's Center for Operational Oceanographic Products and Services (COOPS)

Inundation Landmarks & Impact Graphics

Front Street, Beaufort, NC



https://tidesandcurrents.noaa.gov/inundationdb/

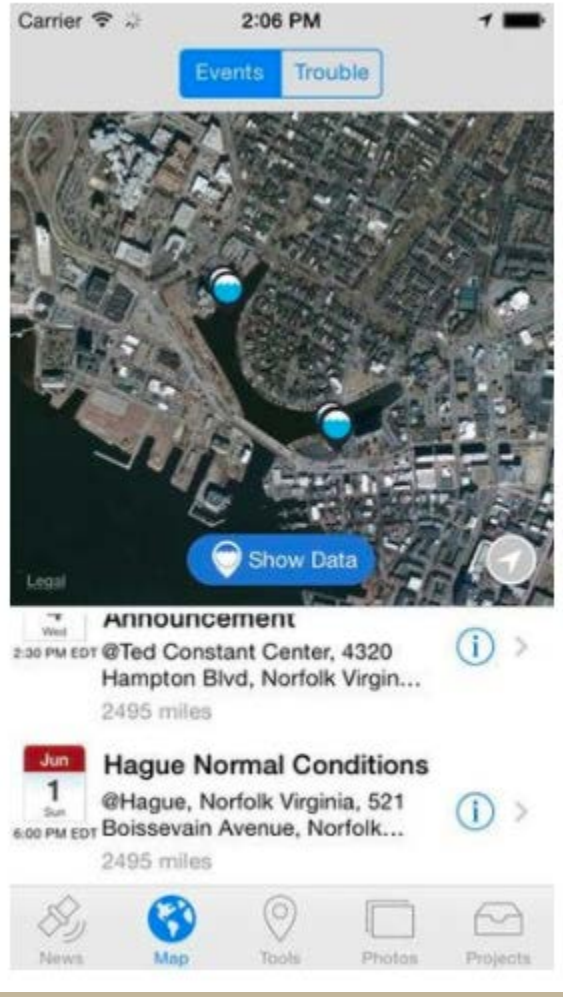
Data users and application

- National Weather Service
- Local Government
- Town Planners
- Model Validation
- Schools

Other available apps

Sea Level Rise

Welcome to Sea Level Rising!
We provide groups and toc
regions throughout the w



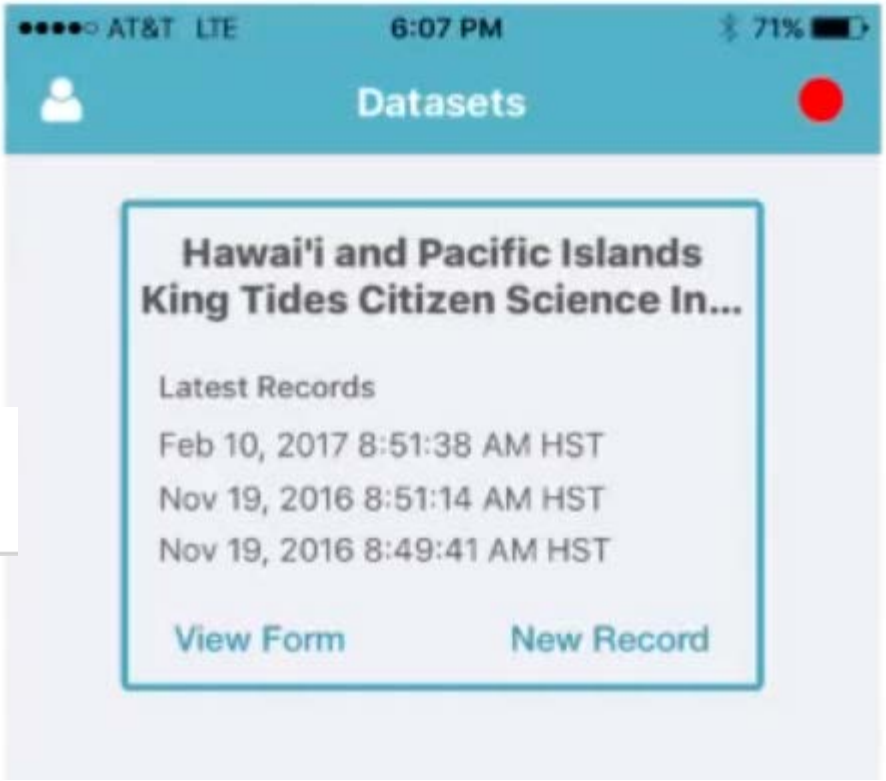
MyCoast

(SC, ME, MA)

Liquid Field Notes

Liquid Productivity

Everyone



Feedback - Discussion

- Using the application,
- Diversifying Use,
  - Expanding geographically
  - Other applications of the data
- Suggestions for getting the word out
- Other Suggestions - Recommendations