

USGS Storm-Tide Monitoring and Reporting



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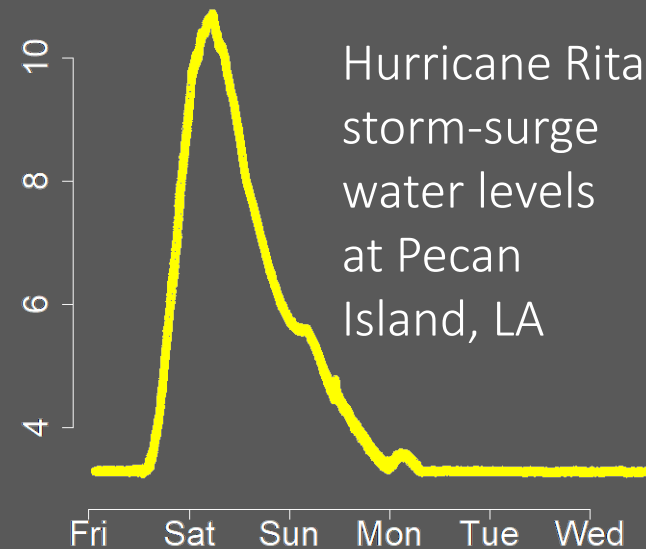
USGS Storm-Tide Monitoring

- Supplements USGS and NOAA *in situ* coastal water-level observations
- Can be geographically broad, highly detailed, with high temporal resolution
- Provides water-level data for “hydrodynamic snapshots” before, during, and after hurricane landfall
- Helps address needs of
 - FEMA -flood-extent and flood-damage documentation
 - NOAA/USGS –storm-surge model performance verification
 - NOAA Coastal Act damage causation
 - Emergency managers → Working to increase availability of real-time data
- All water-level, wave, and highwater data delivered through USGS Flood Event Viewer <https://stn.wim.usgs.gov/fev/> and USGS official reports

Old Process (2006)



- Rapid, opportunistic deployments
- Focused on single self-logging sensor
- Storm-surge water level and high-water marks
- USGS only
- Post-storm recovery and data processing
- Data provided through formal USGS reports and data releases



Current and Evolving Process

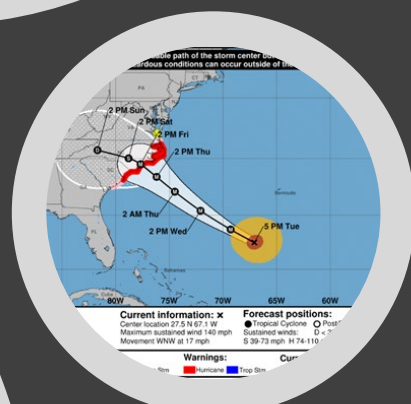
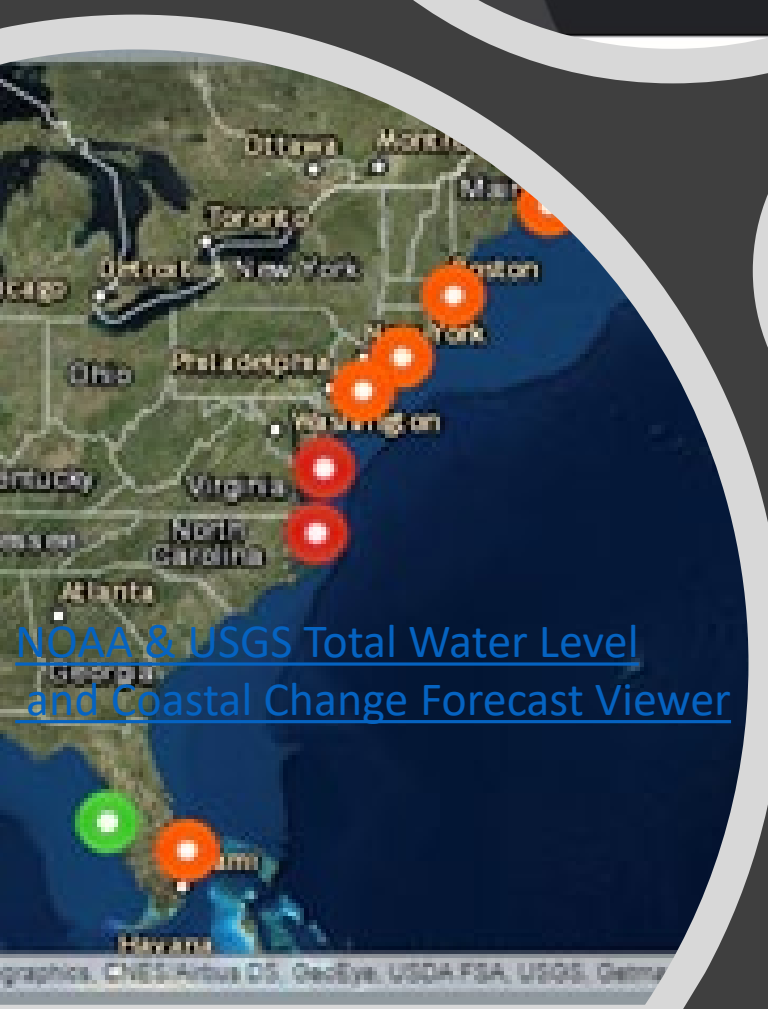
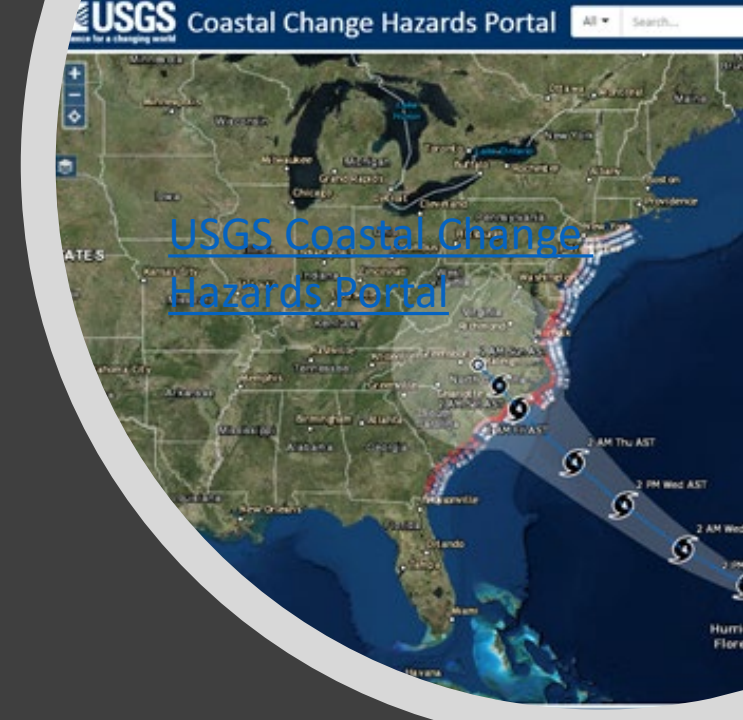
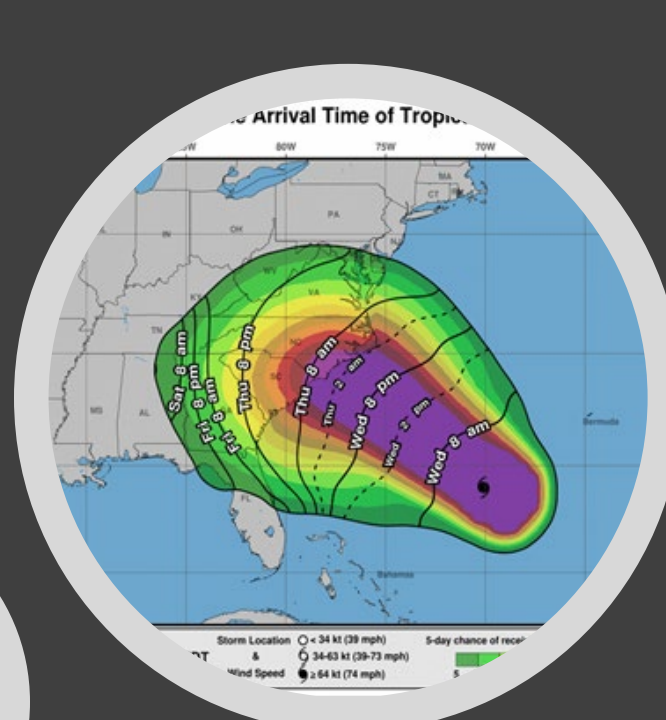
- Integrated networks
 - Permanent streamgages
 - Temporary locations
 - Preselected and Opportunistic
 - Gradually shifting to real-time
 - Dashboard and webservices delivery
- Broader suite of data
 - ✓ Water Levels and Waves
 - ✓ High Water Marks
 - Barometric Pressure, Water Temperature, Wind speed and Direction, Rainfall
- Future opportunities
 - Camera images
 - Surface water velocities
 - Conductivity (for saltwater intrusion)



The USGS Storm-Response Team plans deployments and coordinates methods:

- Prepares and maintains written USGS storm-response plan
- Coordinates deployment with FEMA and USGS authorities
- Works to identify targeted deployment locations and track deployment progress
- Hosts daily operational storm-response conference calls (with invited OFAs)
- Compiles and organizes geo-narratives for documentation and reporting
- Highlights other USGS, OFA contributions
 - Total Water Level (storm tide, waves, runup)
 - Beach and Dune impact forecasts and assessments
- Facilitates discussions with FEMA, NWS, USACE, NSF projects regarding post-storm identification, flagging, surveying field work, and documentation
- Facilitates upward reporting



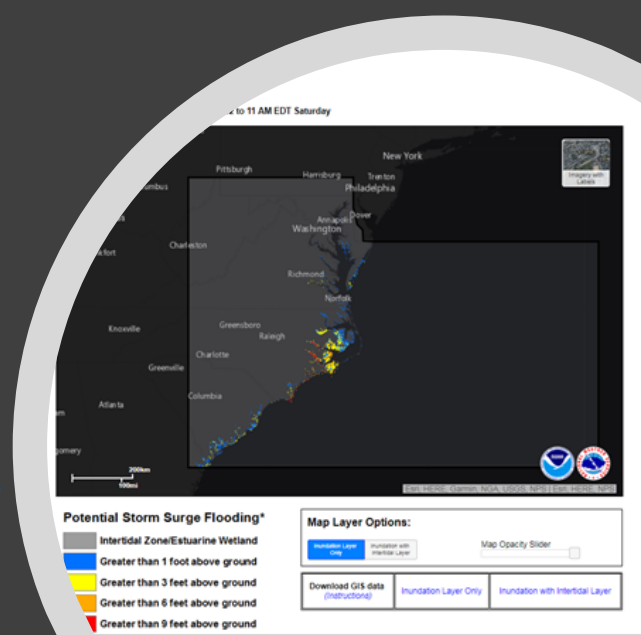


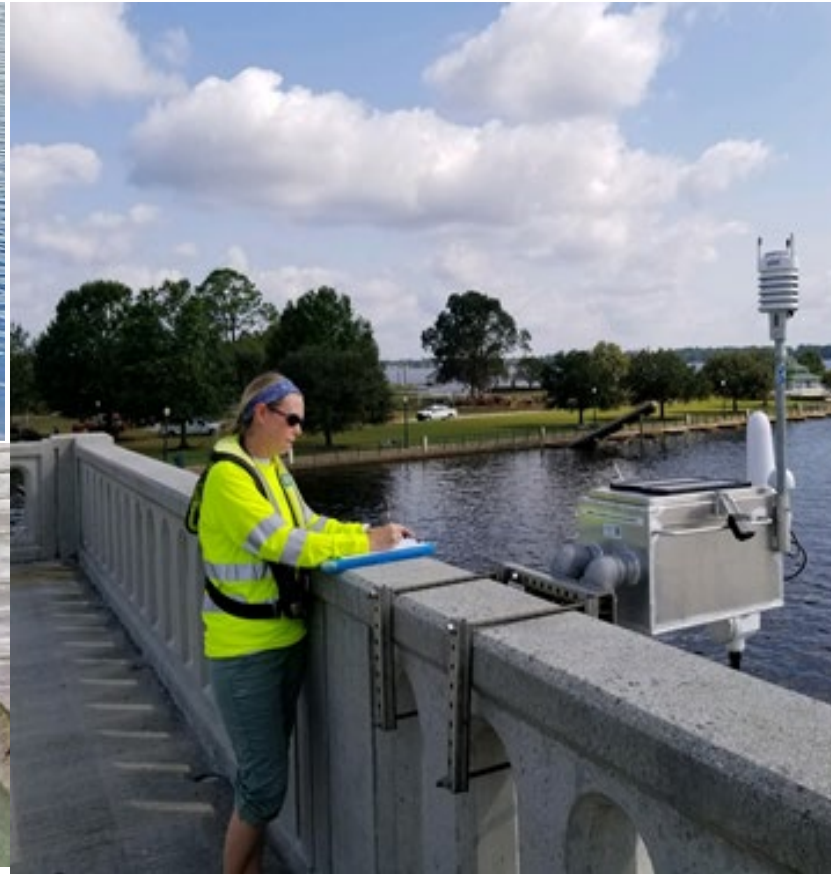
[NWS NHC Arrival Time of TS Winds](#)

USGS uses many tools and inputs to determine If, When & Where we collect Storm Tide data

[NWS NHC Cone w/ Wind Field](#)

[NWS NHC Potential Storm Surge Flooding \(P-Surge\)](#)

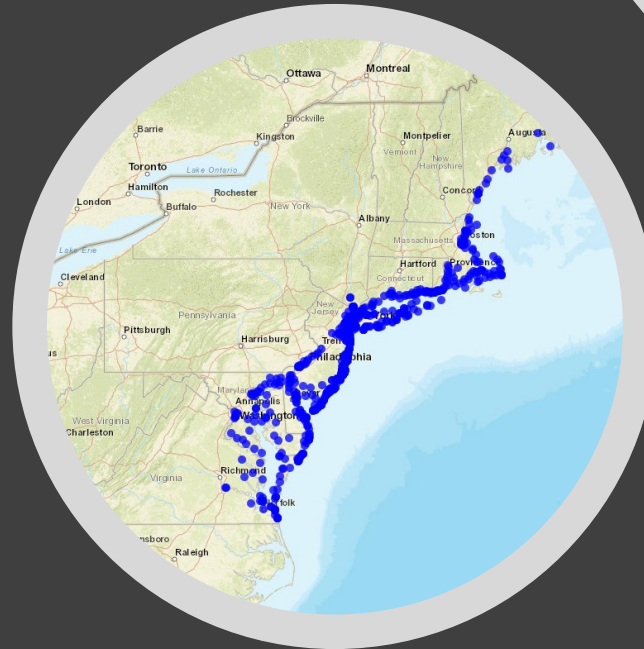




Storm Tide Sensor, Brackets, and Rapid Deployment Gage

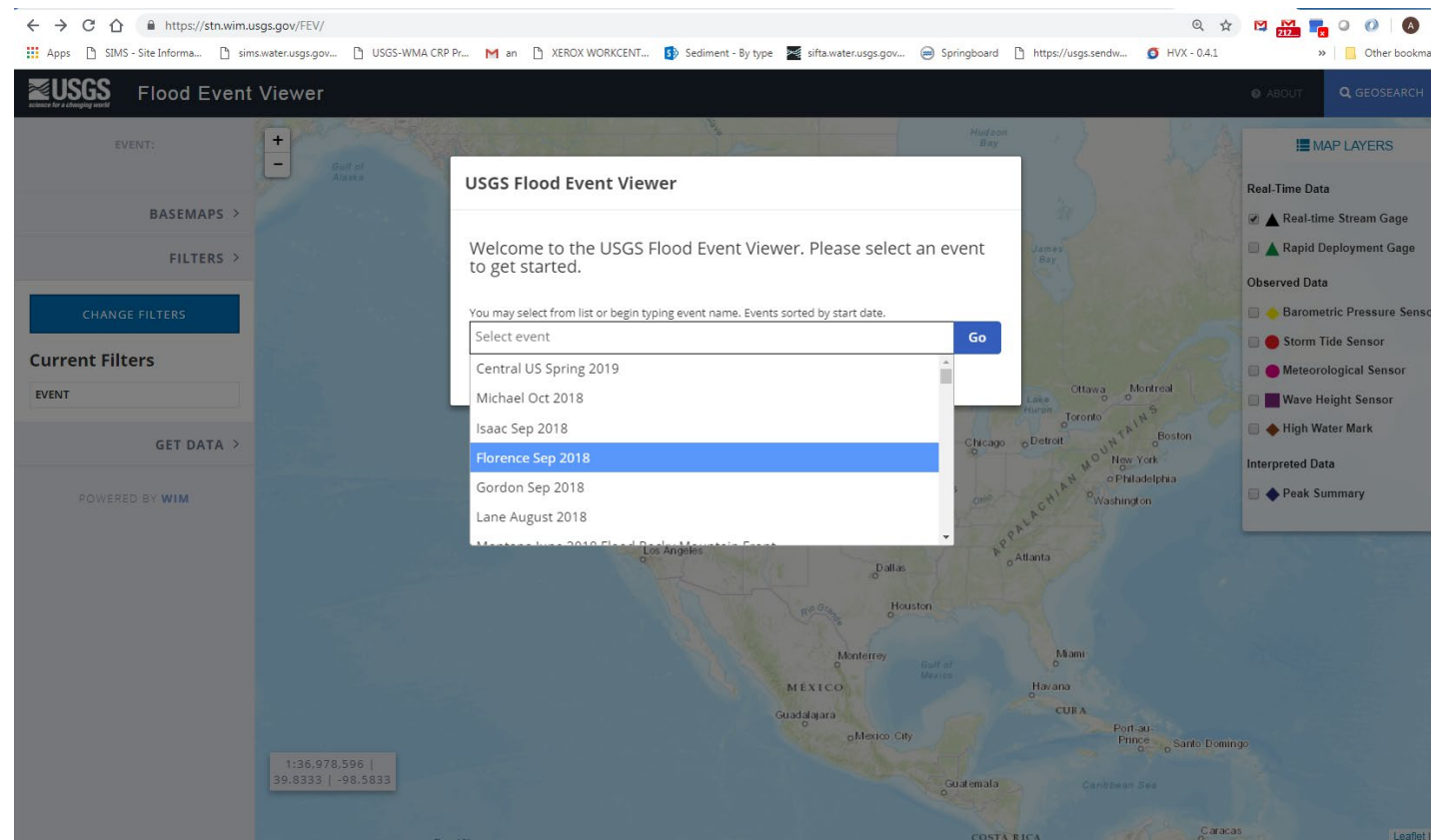
USGS Storm-Tide and Hydrodynamic (SWaTH) Network

- Pre-identified sites
 - Faster sensor deployment, recovery, processing
 - Some have pre-surveyed brackets to receive instruments
- Plus opportunistic locations
 - Fill in gaps
- COMING SOON: The West Coast and Hawaii



Where do you get the data?

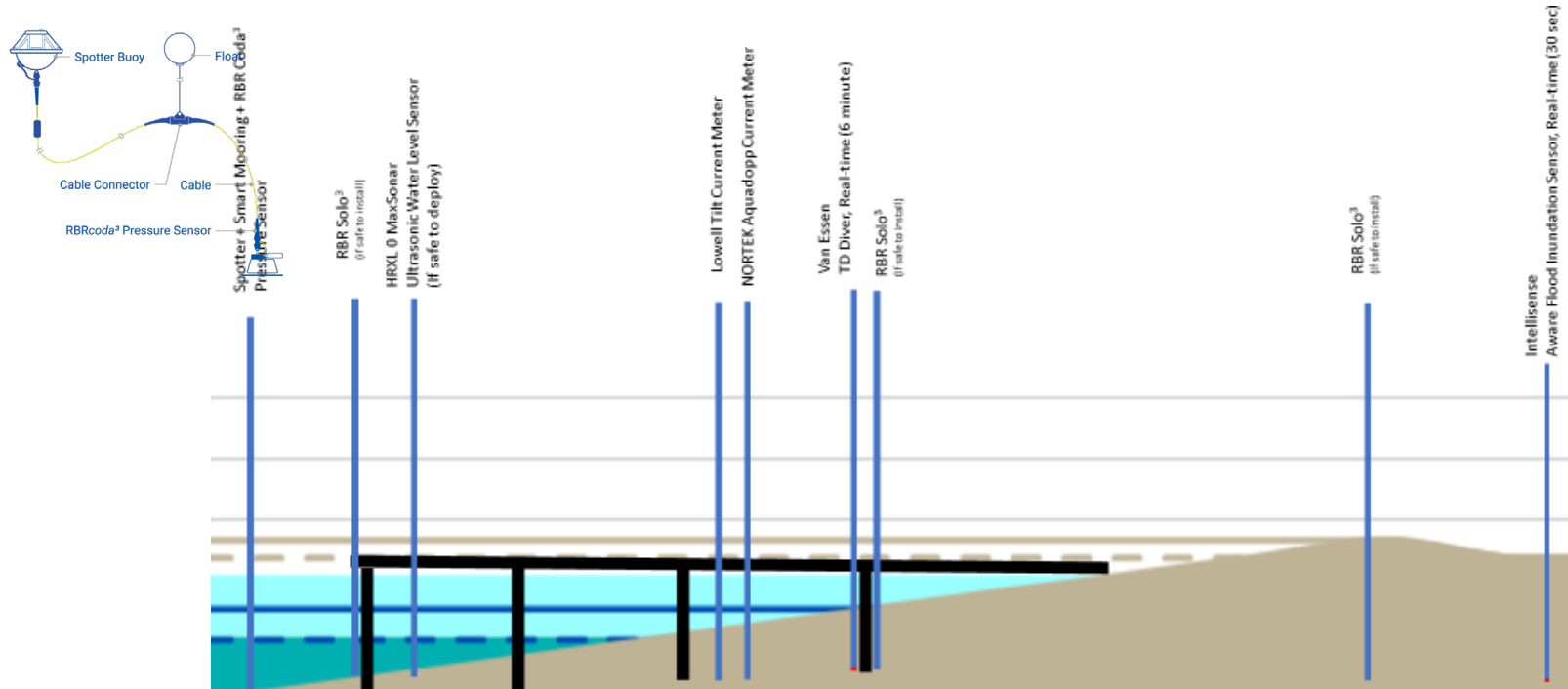
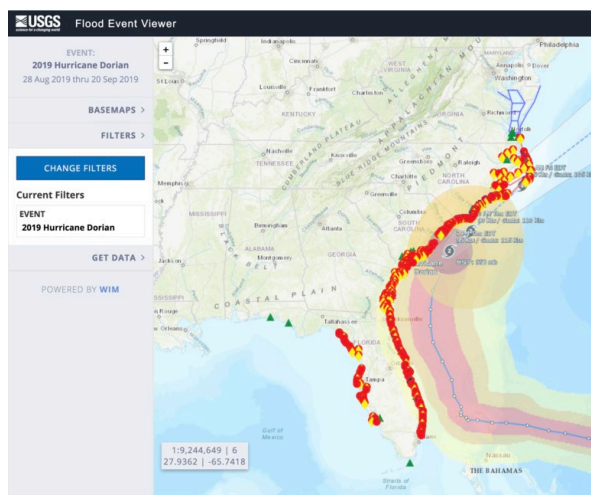
USGS Flood Event Viewer: <https://stn.wim.usgs.gov/FEV/>



Real-time and Observed Measurements of Hurricane-Induced Hydrodynamics and Flooding

Deployment Plan (2022-2024):

- 2 detailed cross-shore transects of wave and water level sensors
- 2-3 days prior to landfall, for 3 named storms
- On land, utilize existing infrastructure (piers)
- Offshore, rapidly deploy moored buoy (~20m)



Partner Agencies

Federal Emergency Management Agency (FEMA)

National Ocean and Atmospheric Administration (NOAA)

National Hurricane Center (NHC)

National Weather Service (NWS)

U.S. Army Corps of Engineers (USACE)

U.S. Fish and Wildlife Services (USFWS)

National Park Service (NPS)

National Science Foundation (NSF)

Office of Naval Research

State Departments of Transportation

Emergency Management Agencies

Questions?

