

Introduction to the USGS Storm-Tide Monitoring Program (STMP) and Flood Event Viewer (FEV)

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STMP: Program History and Overview

Mission

- To better understand potential impacts on coastal communities and habitats.
- 2005: Program established after Hurricane Katrina.
- 2005: First deployment of sensors was for Hurricane Rita.
- 2012: Hurricane Sandy Relief funding spurred enhancements to the program through the Surge, Wave, and Tide Hydrodynamics (SWaTH) Network.
- USGS deploys sensors for Nor'easters as well as tropical storms.
- <u>Storm-Tide Monitoring | U.S. Geological Survey (usgs.gov)</u>







STMP: Program History and Overview

Goals

- Increase understanding of behavior of different kinds of storms and their associated storm tide and waves over various landforms to help improve storm-surge models.
- Describe the characterization of long-term storm-surge flood potential for land-use planning and building-code development.
- Collaborate with Federal, State, local partners, emergency managers, coastal researchers, and modelers by providing real-time and event specific data on weather related flooding events.

Figure: Seaside Heights, New Jersey before (top) and after (bottom) the landfall of Hurricane Sandy in October 2012





STMP: Regional Networks

Five primary STMP Networks have been established:

- North Atlantic Network (Maine to Virginia).
- South Atlantic Network (North Carolina to Florida's east coast, including Florida Keys, Puerto Rico, and Virgin Islands).
- Gulf of Mexico Network (Florida's west coast, excluding Florida Keys to Texas).
- Eastern Pacific Network (Washington to California).
- Central Pacific Network (Hawaii and Guam).





STMP: Program History and Overview





Storm Surge

- As a storm moves towards the coast lower pressure and strong winds produced by the storm causes pressure and wind driven surge to pile up on the coastline.
- The combination of pressure and wind driven surge is called the storm surge.
- <u>Coastal Hydrology and Storm Surge</u>
 <u>U.S. Geological Survey (usgs.gov)</u>



(The COMET program, NOAA)



What is Storm Tide?

- Storm tide is the combination of normal astronomical tide plus storm surge.
- On top of the storm tide is winddriven waves, these are considered the total water level.





Sensors:

- Contact & non-contact
- Pressure transducers
- Radar gages
- Barometric pressure sensors

Measuring:

- Water-level
- Barometric pressure
- High water marks



The goal is to record as much of tidal cycle as possible to distinguish the storm tide from the normal tidal range.



STMP: Data Dissemination – Flood Event Viewer (FEV)



Flood Event Viewer:

- Provides a central location for the public and other agencies to access and download collected data from specific flooding events.
- Locations of gages and high-water marks, site information, hydrographs, data files and site photos can all be viewed and downloaded.

Flood Event Viewer (usgs.gov)

Hurricane Ian, Sanibel Island, Florida – September 2022

- Unfiltered peak (with waves) = 16.59 ft.
- Filtered peak (water-level without waves) = 13.09 ft.







STMP: Flood Event Viewer Demonstration

Flood Event Viewer (usgs.gov)



Questions?





