



Storm Surge GIS Data: Important Mapping Process Input

Overview

FEMA is committed to continuing the recovery process in New Jersey by providing the best available flood risk data to help guide communities in their efforts to reduce the impact of flood events and protect lives and property from future damages. To accomplish this, FEMA is implementing a comprehensive outreach initiative to share data and to ensure that affected communities are fully engaged and informed throughout the Flood Insurance Rate Map (FIRM) development process.

FEMA has prepared a series of fact sheets that provide important information regarding the types of data that communities will receive. In addition to describing the data, these fact sheets provide guidance on how communities can use that data to better understand their flood risk, as a tool in the decision making process, and to plan for mitigation activities. Other fact sheets available in this series include:

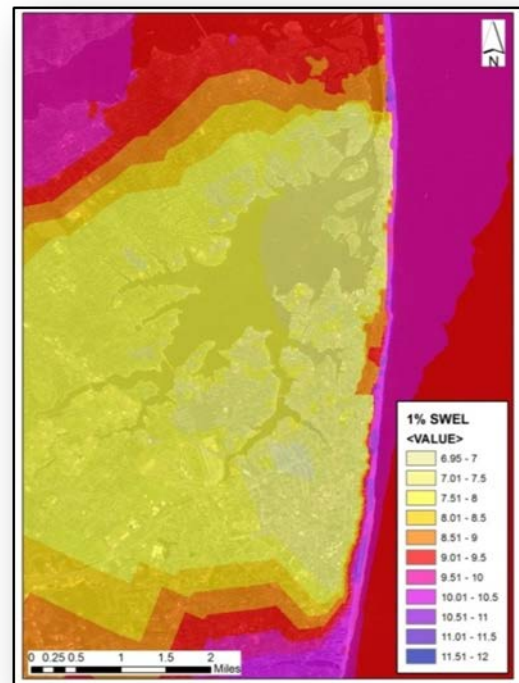
- Field Reconnaissance and Transect Data: Important Mapping Process Inputs
- Coastal Hazard Analysis Modeling Program (CHAMP) Database Interpretation
- New Jersey Preliminary Work Map Interpretation

Storm Surge and how it is Modeled

Storm surge is the amount of water, combined with the effect of normal tides, which is pushed towards the shore during a storm. The height of the storm surge is driven by many variables, such as the strength, size, and direction of the storm. The ADCIRC (ADvanced CIRCulation) coastal circulation and storm surge computer model in conjunction with the Simulating Waves Nearshore (SWAN) computer model was used to model the effects of storm surge in this coastal flood study. Specifically, the models were used to determine the probability of storm surge events of the 10 percent, 2 percent, 1 percent, and 0.2 percent annual chance magnitudes.

Storm Surge Data

The digital storm surge data is initially developed as a series of points. Then, using GIS software, the points are connected to make a seamless surface of pixels called a “raster.” This surface shows how the water surface is connected between the points. These data are also called the Stillwater Elevation (or SWEL) surfaces.



GIS showing one percent SWEL surface

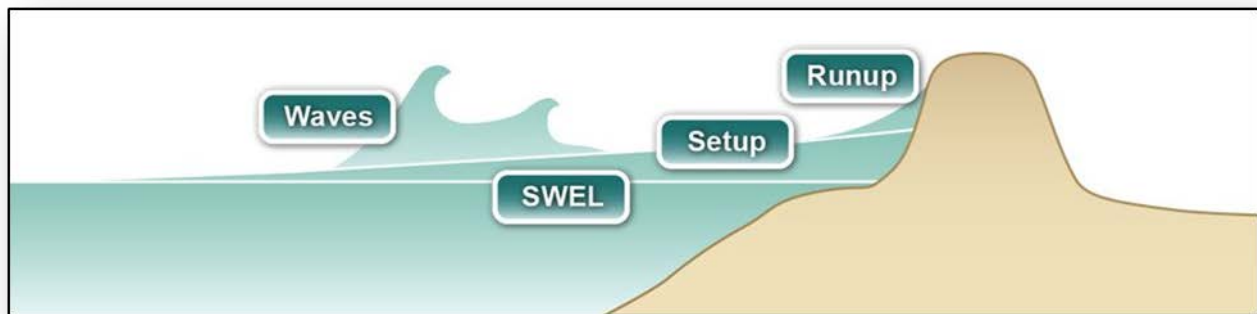


The graphic above shows a sample 1 percent annual chance SWEL surface. The line where the surface is at the same elevation as the ground is the flood hazard boundary for the various annual chance events. Keep in mind a stillwater elevation does not take into account all effects from waves coming ashore during a storm event. The storm surge GIS dataset includes digital data for the 10 percent-, 2 percent -, 1 percent -, and 0.2 percent-annual-chance events.

Why this Data is Important

The 1 percent SWEL surface is used as the starting stillwater elevation for the erosion analysis, overland wave height modeling, and runup modeling, which have also been performed as part of this coastal flood study, and are necessary to accurately determine coastal flood hazards in conjunction with storm surge. The 1 percent SWEL is one of three components that must be combined to create the Base Flood Elevations (BFEs) included on the FIRMs. The three components are:

- Storm Surge Stillwater Elevation (SWEL) and wave setup
- Wave height above storm surge (stillwater) elevation
- Wave runup above storm surge elevation.



Coastal storm surge stillwater elevation (SWEL), wave setup, and wave runup

How the Data can be Used

These data can be reviewed to see the storm surge elevations for the various return intervals. In most cases, these data will be lower than the final BFEs included on the FIRM, but can give a sense of the location of the mapped flood hazard areas before erosion and wave runup are taken into account.

Where to Go for More Information

The New Jersey Department of Environmental Protection will be hosting a series of webinars and community meetings in coordination with FEMA to further explain the data that is received and answer questions about next steps. Please visit <http://www.region2coastal.com/> for more information on FEMA's data sharing initiative with New Jersey coastal communities.