

# Mapping tools help towns plan for coastal flooding

By **Jody Carrara**, ANJEC Project Director

In October, I was part of a group of local planners, environmental commissioners, and emergency managers who learned how to use current Geographic Information System (GIS) data to map areas most vulnerable to flooding and storms. We attended an exceptional hands-on GIS training course hosted by the New Jersey Coastal Management Office and the Jacques Cousteau National Estuarine Research Reserve, located in Tuckerton.

The Coastal Inundation Mapping course was taught by National Oceanic and Atmospheric Administration (NOAA) representatives from the Coastal Services Center located in Charleston, SC. The course was brought to New Jersey through the efforts of Leigh Wood, a Coastal Service Center Fellow working with the New Jersey Coastal Management Office on a project that maps community vulnerability to coastal hazards and sea level rise.

We've all experienced more frequent flooding in our towns--from Trenton to Bound Brook, the barrier islands and the Delaware Bay coast. We must assess those high risk areas and plan and zone accordingly. Mapping using a GIS, which overlays data from a variety of sources, can be used to visualize scenarios that may happen to any coast, river or stream during a storm event. This NOAA course helped us to answer questions like how high and widespread the flooding might be.

## Putting it all together

Two full days of lecture and hands-on mapping using ArcGIS software taught us

how to take information from NOAA, the US Geological Survey (USGS), the Federal Emergency Management Agency and others and incorporate the data into one map. Course attendees started by working with the elevation data and then added more data sets to accurately model different storm events on those elevations.

The course discussed remote sensing techniques that can be applied to produce highly accurate and detailed maps of elevation throughout New Jersey. Recently, the New Jersey Coastal Management Office, in partnership with the USGS, was able to secure Light Detection and Ranging (LiDAR) mapping for Cape May, Cumberland and Salem Counties. More up-to-date LiDAR mapping for Ocean and Atlantic Counties will be available in 2011. The course also illustrated the importance of bathymetric data (ocean, bay or river underwater topography) to get an accurate model of the potential impacts of storm surge, nor'easters and sea level change.

## Building on a solid base

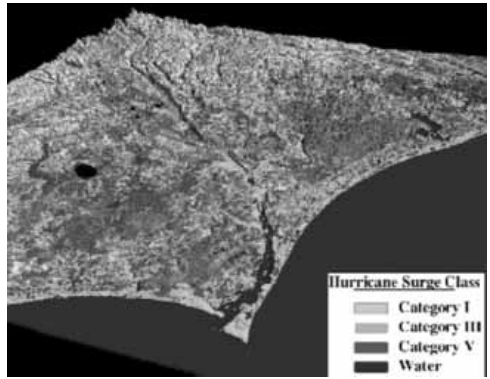
Once base layer maps are generated, you can begin to model or map predictions of flood elevations derived from USGS tide gauges and local flood data. NOAA has a storm surge model that was used throughout the course to illustrate mapping modeled water surfaces. This tool, the Sea, Lake, and Overland Surge from Hurricanes (SLOSH) model, was developed by NOAA and the National Weather Service. It identifies the potential surge zones associated with the various storm categories on the Saffir-Simpson hurricane scale.

The GIS techniques helped us to visually depict those areas in a town most susceptible to storm surge and inundation. A major benefit of the SLOSH model for planners, engineers and emergency management is that it can be used operationally, or in real time. The anticipated final product of Wood's fellowship next August 2011 will be a "Community Vulnerability Assessment Mapping Guide" that will walk the user through the step-by-step preparation of the offered mapping methods.

Flooding causes an average of \$6.9 billion each year in damages in the US according to NOAA information. Most of our New Jersey population lives along a coast. (We all want a water view, don't we?) We don't need a crystal ball to see that flooding in New Jersey will continue. But the power of mapping using a GIS can help planners prepare zoning and build capacity to protect coastal residents and property to the greatest extent possible.

### Coming soon!

Want to learn more about mapping areas vulnerable to flooding and storms? ANJEC will be hosting a workshop in Spring 2011 on Coastal Inundation Mapping. Watch your email or visit our web site ([www.anjec.org](http://www.anjec.org)) for updates.



*On this NOAA model, various surge zones are draped over the Digital Elevation Model for the Onslow Bay region. (See [www.fema.gov/hazard/map/index.shtml](http://www.fema.gov/hazard/map/index.shtml) )*

### More information

- New Jersey's Coastal Management Program: [www.state.nj.us/dep/cmp/czm\\_data.html](http://www.state.nj.us/dep/cmp/czm_data.html)
- NOAA Coastal Services Center: [www.csc.noaa.gov/](http://www.csc.noaa.gov/)
- NOAA SLOSH information: [www.csc.noaa.gov/products/nchaz/htm/ccap4.htm](http://www.csc.noaa.gov/products/nchaz/htm/ccap4.htm)
- Jacques Cousteau Coastal Center: [www.jcnerr.org](http://www.jcnerr.org)
- ANJEC Resource Center at [resourcecenter@anjec.org](mailto:resourcecenter@anjec.org) or (973) 539-7547 