

# DHS Science and Technology Directorate Centers of Excellence

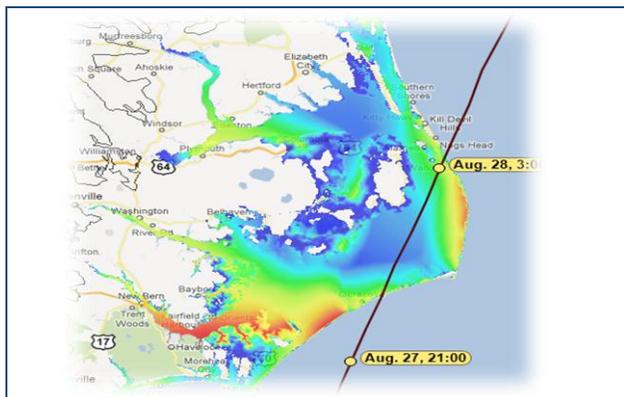
## Getting ahead of the storm surge: ADCIRC model

### Modeling tool gets DHS ahead of the storm surge

A Department of Homeland Security (DHS) Science and Technology Coastal Hazards Center of Excellence model is helping the U.S. Coast Guard and FEMA get people and property out of the way of life-threatening storm surges with highly accurate predictions of where flooding will take place.

### Highly accurate model predicts flooding before it happens

The **ADCIRC storm surge model**\* combines rain, atmospheric pressure and wind forecasts to predict when, where and to what extent flooding will inundate a coastal community with greater precision than other available models. This enables decision makers to identify which locations to evacuate as a storm approaches and to plan for mitigation and response before severe storms occur.



Maximum Water Inundation Forecast, Hurricane Irene, Aug. 25

### The ADCIRC model is used in many ways

Applications of the ADCIRC model include:

- Informing near shore marine operations
- Predicting hurricane storm surge and flooding
- Modeling oil spill movement in nearshore areas
- Modeling tides and wind driven water circulation
- Modeling the impact of potential sea level rise on coastal communities

\*Winner of the DHS Science & Technology Impact Award, 2010

\* DHS Office of University Programs funding contributes to the development of the ADCIRC model

### Real results for real users

- FEMA is using the ADCIRC model to update the National Flood Insurance Program coastal inundation maps
- U.S. Army Corps of Engineers is using ADCIRC model for hurricane protection system design, sediment erosion and morphodynamic studies
- National Weather Service Weather forecast offices, National Hurricane Center, NOAA, U.S. Coast Guard, and the N.C. Division of Emergency Management use ADCIRC model results to help guide marine forecasts and storm response
- Louisiana Governor's Office of Homeland Security and Emergency Preparedness used ADCIRC model results to prepare for and respond to Hurricanes Gustav and Ike

### ADCIRC helps U.S. Coast Guard in Hurricane Irene response

In August 2011, the DHS Coastal Hazards Center of Excellence research team assisted the U.S. Coast Guard by predicting the potential storm surge/wave/flooding impact of Hurricane Irene using its ADCIRC model. U.S. Coast Guard Atlantic Commander Vice Admiral R.C. Parker and Rear Admiral W.D. Lee, Fifth District Commander, praised the Center's efforts, which provided the Coast Guard with critical information used to relocate a Command Center and Incident Management Team. The original location of the Command Center was inundated by the hurricane. By relocating the Command Center in advance of the hurricane, the Coast Guard was able to operate effectively in the response effort without interruption.

*ADCIRC "provided critical information I used in my decision making to move our Command Center and Incident Management Team...ahead of [Hurricane Irene]."*

– Rear Admiral W.D. Lee,  
Commander, Fifth District,  
U.S. Coast Guard



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