



COASTAL HAZARDS CENTER

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Research and Education Areas

- Coastal Hazards Modeling
- Engineering to Enhance Resilience
- Disaster Response and Social Resilience
- Planning for Resilience
- Emergency Management Analytics and Support
- Education and Curriculum Development

“What the Disaster Response Intelligent System (DRIS) did for us is just so great and impressive. I am looking forward to working with [the team] more. Having our data and making that type of map for us to use in our recovery process is just super.”

- Director Bernice McGinnis
Emergency Operations Center
Yazoo County, MS

Mission: Enhance the Nation’s ability to safeguard its people, property, and economy by increasing their resilience to the consequences of natural hazards.

Quick Facts

- Established in 2008 in response to Hurricane Katrina.
- Only DHS Center of Excellence solely dedicated to the study of natural disasters.
- Conducts research and education to advance the understanding of natural hazards and community resilience and transfers that knowledge into action, resulting in reduced loss of life and less damage to homes, businesses, infrastructure, and the natural environment.

Partners

- Co-led by the University of North Carolina at Chapel Hill and Jackson State University in Mississippi.
- Made up of an extended network of over 33 academic, public sector, private sector and non-profit partners located throughout the United States.

Key Accomplishments

- Developed 56 new courses and seven new concentrations in hazards-related studies from coastal engineering to social sciences at 14 colleges and universities, including six Historically Black Colleges and Universities and one Hispanic-Serving Institution.
 - Students work directly with homeland security practitioners, both in the classroom and in the field, and 30 percent of graduates enter homeland security-related fields.
- Advanced state-of-the art capabilities in storm surge/flood forecasting, disaster management decision support, hazard mitigation planning, disaster recovery planning, and coastal engineering.
 - FEMA, U.S. Coast Guard (USCG), U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration (NOAA), states, and localities use CHC research products for planning and operations when hurricanes strike, including Irene, Isaac, and Sandy.
 - CHC research products enable more effective resource staging, continuity of operations, flood control, and post-storm recovery.
- Won 2010 and 2012 DHS Science & Technology Impact Awards for Advanced Circulation (ADCIRC) storm surge/flood forecasts that improved preparedness/response during hurricanes Gustav, Ike, and Irene.
- Won the 2012 Special Achievement in GIS Award from the Environmental Systems Research Institute for Disaster Response Intelligent System (DRIS).



“Your academic research and development of a user-friendly storm surge model has been invaluable to the Coast Guard... The fidelity of your model gives the Coast Guard a defensible method of determining high risk areas during major weather events.”

– Vice Admiral R.C. Parker
U.S. Coast Guard

Research Partners

Louisiana State University
North Carolina State University
Renaissance Computing Institute
Rensselaer Polytechnic Institute
Texas A&M University
Texas Southern University
University of Houston at Clear Lake
University of Maryland
University of Oklahoma
University of Notre Dame
University of South Carolina

Education Partners

Alcorn State University
Center for Defense Integrated Data
Engineer Research
and Development Center
Johnson C. Smith University
Lockheed Martin
Louisiana State University
Northrup Grumman Center
for High Performance Computing
University of Houston
Tougaloo College
Tulane University

End-Users

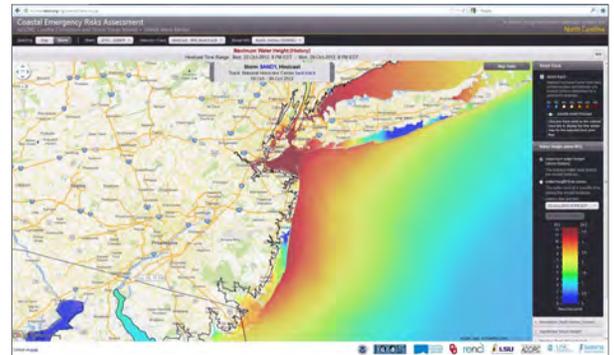
American Planning Association
Association of State
Floodplain Managers
FEMA Disaster Recovery Division
FEMA Hazard Mitigation Division
FEMA National Flood Insurance Program
Local Emergency Managers
National Weather Service
Natural Hazard Mitigation Association
State Emergency Management
Agencies (NC, MS, LA, VT)
U.S. Army Corps of Engineers
U.S. Coast Guard

CHC Highlights

ADCIRC (Advanced Circulation Storm Surge/Flood Model)

CHC developed ADCIRC, an advanced (rain, wind, hydrological, storm surge, wave) model that forecasts where, when, and to what extent flooding will inundate a coastal community. The U.S. Coast Guard used

ADCIRC model results during Hurricanes Irene, Isaac, and Sandy to aid storm-related decisions, such as deployment locations and maintaining continuity of operations. FEMA is using ADCIRC models to update National Flood Insurance Program coastal inundation maps from New York to Texas.



Disaster Response Intelligent System (DRIS)

CHC developed DRIS, a GIS-based decision support system for disaster response and recovery. It links to multiple emergency management tools (e.g., hurricane storm surge models, plume models, WebEOC, and live feeds for traffic, earthquake, weather) with pre-populated datasets (such as local infrastructure maps) within a single, easy-to-use framework. State and local emergency managers deployed DRIS for several disaster response operations including two Mississippi tornado events in 2010 and the Mississippi River flood in May 2011. It is presently used by several counties, the Mississippi Emergency Management Agency, the Mississippi National Guard, a local fire department, and a private sector firm.

Analysis of Federal Mitigation Policy in the United States

CHC researchers have developed a method to evaluate the quality of state and local hazard mitigation plans. These plans help communities design and build homes, businesses, roads and other critical structures that are resilient to natural hazards. Existing plans were scored and weaknesses identified. FEMA has used results to guide planning and inform federal policy decisions.

In-Situ Scour Evaluation Probe

Scour, or erosion of soil around structures due to water flow, is responsible for a wide range of critical infrastructure failures – from unstable bridges to levees. CHC has developed an in situ scour probe, the first tool of its kind to measure scour potential in the field. In situ analysis provides quicker, more accurate results compared to traditional processes that require excavation, sampling and lab processing.



Education Spotlight: The DSM Student Association (DSMA)

Students in CHC’s Disaster Science Management program (DSM) at Louisiana State University (LSU) started a disaster management association, the DSMA, that in 2010 served as LSU’s campus point of contact for BP Oil Spill volunteer coordination. DSMA members train extensively (e.g., Community Emergency Response Team training, Red Cross, Residential Life full-scale fire exercises, CHEMPAK training, anthrax, and nuclear power plant exercises), host National Weather Service SKYWARN training for the LSU campus, and stand ready to assist their communities.