

## OVERVIEW

The Department of Homeland Security Coastal Hazards Center of Excellence (CHC) performs research and develops education programs to enhance the Nation's ability to safeguard populations, properties, and economies from natural disasters in coastal areas.

CHC's Research and Education components advance the understanding of natural hazards and community resilience—and transfer that knowledge into action, resulting in reduced loss of life or injury and lessened damages to the built and natural environment.

CHC is co-led by the University of North Carolina at Chapel Hill (Research) and Jackson State University (Education) in Jackson, Mississippi.



## RESEARCH

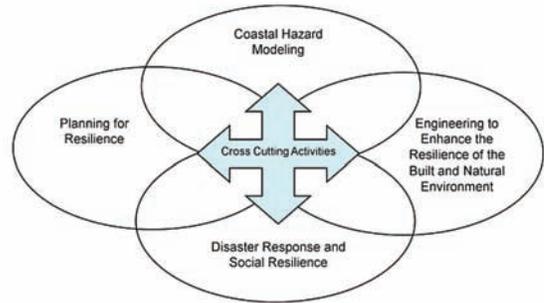
LEAD: THE UNIVERSITY  
OF NORTH CAROLINA AT CHAPEL HILL



The Center for Natural Disasters, Coastal Infrastructure and Emergency Management (DIEM) and its partners, comprised of physical and social scientists, engineers, planners, and modeling specialists, conduct research on natural hazards and disasters and disseminate the knowledge developed to hazard scholars and practitioners, community officials, individuals, and other end-users.

DIEM is organized around four closely linked research focus areas:

### DIEM Conceptual Diagram



### Research Focus Areas:

- 1) **Coastal Hazards Modeling**—emphasizes the study of the physical science of hazards to understand the meteorological, hydrological, geophysical, and other characteristics of hazards, develop improved models to assess their behavior and test these models in order to predict impacts on human settlements and natural systems.
- 2) **Engineering to Enhance the Resilience of the Built and Natural Environment**—emphasizes the interaction between hazards and the built and natural environments to promote an improved understanding of how infrastructure, including natural systems, can be designed or managed to facilitate resilience.
- 3) **Disaster Response and Social Resilience**—examines the institutional and social conditions that facilitate improved levels of community preparedness, emergency response and post disaster recovery.
- 4) **Planning for Resilience**—evaluates planning and decision-support tools. Plan evaluation methods are used to determine the efficacy of hazard mitigation, disaster recovery and preparedness plans, including their ability to improve resilience.

**Advanced Visualization Analytics**, a cross-cutting activity, supports the four research focus areas. It provides visualization, analysis, and geospatial technology that enhances the effectiveness and integration of the Center's research and products.

# Advancing natural hazards resilience through multi-disciplinary research, innovative engagement strategies, and education

## EDUCATION

LEAD: JACKSON STATE UNIVERSITY



The Center for Analysis and Response for Coastal Hazards (ARCH) develops curricula that promotes holistic, creative, and resilient solutions to the challenges of natural hazards in the Nation's coastal zone and provides analytical tools for local emergency managers. Examples of ARCH's programs include:

- Undergraduate and graduate research-oriented curricula in coastal engineering with a focus on natural hazards at Jackson State University.
- Methods for rapid, high-resolution storm surge forecasting for use by local emergency managers and others.
- Coastal hazards concentration and integration into existing course tracks at Alcorn State University, Jackson State University, Johnson C. Smith University, Mississippi Valley State University, and South Carolina State University.
- Emergency and public safety management courses at Alcorn State University, Jackson State University, Mississippi Valley State University, and the University of Houston.
- Disaster science and management courses for peer-to-peer or distance education at Louisiana State University.
- Disaster response data integrated into core research methods classes.



## CHC PARTNERS

- University of North Carolina at Chapel Hill – Research Lead
- Jackson State University – Education Lead
- Alcorn State University
- California State Polytechnic University at San Luis Obispo
- Georgia State University
- Johnson C. Smith University
- Louisiana State University
- Medical University of South Carolina
- Mississippi State University
- Mississippi Valley State University
- NOAA National Weather Service Severe Storms Laboratory
- North Carolina State University
- Renaissance Computing Institute
- Rensselaer Polytechnic Institute
- Rice University
- South Carolina State University
- Texas Southern University
- Tougaloo College
- Tulane University
- University of Connecticut
- University of Delaware
- University of Houston
- University of North Carolina at Charlotte
- University of Oklahoma
- University of Texas at Dallas
- Engineer Research and Development Center