UNC Center for the Study of Natural Hazards and Disasters

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Sewell Family Term Professor of Marine Sciences
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Trends and Implications

- Evidence of Natural Hazards and Disasters Continues to Grow

- Disaster Losses Continue to Rise/Rapid Growth in Known Hazard Areas

- Nations, Communities and Organizations Continue to Make Choices that Make them Less Resilient

- Emerging Threat: Climate Change?

- Transferring Knowledge to Practice Remains Underemphasized

- Student Interest
UNC Hazard Center Rationale

- North Carolina, US, world have much to gain keeping natural hazards from becoming natural disasters

- Key gaps in our understanding of many aspects of natural hazards and disasters

- Strategic strengths of UNC-CH departments and faculty to address these gaps through research and translation while educating the next generation of hazard scholars and practitioners
• 2007 won DHS Coastal Hazards Center of Excellence
  – 6 year, $15 million grant from DHS Science & Technology
  – Four Research Focus Areas: Coastal Hazards Modeling, Planning, Engineering, Social Sciences
  – Over 20 partner universities and institutions
  – Key UNC CH players – Marine Sciences, City and Regional Planning, Renaissance Computing Institute (RENCI)

• Additional funding from NSF, NC DEM, FEMA, DHS
  – 2010 Deepwater Horizon Oil Spill
  – Evaluating and updating NC Disaster Recovery Plan
  – Vulnerability of disadvantaged communities
Planning

- National assessment of Community Rating System hazard mitigation plans (reduce flood ins premiums)
- Evaluation of state disaster recovery plans (NC, FL, CA, MS)
- NC disaster recovery plan update
- Assessment of rural resilience
- Assessment of local disaster recovery plans
Coastal Hazard Modeling

- Precipitation
- River Model
- Atmospheric Model
- Wave Model
- River BCs
- Surface BCs
- Surge / Inundation Model (ADCIRC)

Surge / Inundation Model (ADCIRC) Developed at UNC

Requires High Performance Computing and Advanced Cyber Infrastructure Capabilities RENCI!!
Coastal Hazard Modeling

Recently used for

- FEMA National Flood Insurance Program Updates
- FEMA Evacuation Studies
- Hurricane Protection System Design - USACE
- Sea Level Rise / Extreme Event Interactions – NC DEM
- Deepwater Horizon oil spill movement in Gulf
- Individual Event Forecasts
  - Gulf Coast – Gustav 2008
  - Gulf Coast – Ike 2008
  - NC / Atlantic Coast – Irene 2011
Coastal Hazard Modeling

Hurricane Irene 2011

nc-cera.renci.org
Irene flooding forecasts used by

- NC National Weather Service Offices
- NC Division of Emergency Management
- NC County Emergency Operations
- National Hurricane Center
- US Coast Guard Atlantic Command
- New York Times
Engagement

- US Coast Guard, NOAA, National Hurricane Center, USACE, FEMA - modeling
- NC Division Emergency Management – modeling, sea level rise, disaster recovery plan
- State Department (Philippines and Hong Kong) – climate change adaptation
- FEMA National Disaster Recovery Policy
Education

• Post-Docs (6), PhD (31), MS (20), Undergrad (26) – June 30, 2010 (DHS CoE)

• UNC Students in the Workforce
  – Planning: Carolina Cunningham - PBS&J; Chandler Van Schaak - Associate Planner Dept. of Planning Boulder; Sara Reynolds Atkins & Rachel Meyerson - IEM summer intern; Dylan Sandler - Center Research Associate
  – Modeling: Dr. Christina Forbes, National Hurricane Center; Dr. Robert Weaver, FIT

• 2010 MSI Summer Intern Program
  – 2 students via Jackson State Univ., MS

• ADCIRC Modeling “Boot Camp”
  – 2011 - 35 attendees, private sector, government, academic