Disaster Risk Reduction, Resilience, and Sustainability: The Path Forward

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HVRI
HAZARDS & VULNERABILITY RESEARCH INSTITUTE

Organizing Schema

Ecological
Infrastructure
Economic
Organizational
Social & Behavioral
Community

Organizing Principles

1. DRR is the practice of lessening disaster risks through systematic efforts to reduce exposures, lessen vulnerability of people and structures, wise land and environmental management, and improved preparedness (UNISDR 2009).

2. Resilience is both a process and an outcome. The process is to build local capacity to withstand adverse impacts before , during , and after the event. The outcome is the restoration of basic functioning of the systems.

3. Achieving sustainability will entail responsiveness to current conditions and constraints, but also the ability to adapt to uncertain and changing conditions.

4. Managing disaster risks entails a systematic process of multi-scale , multi-actor, and multi-institutional strategies and policies to enhance resilience. Such management recognizes the continuum on initiating events ranging from sudden onset events to longer term slow onset ones.

5. Adaptation to climate change is part of disaster risk management and if DRM strategies enhance resilience in the short term; they will also facilitate climate adaptation in the longer term , thus insuring a sustainable future.

Paths Toward Sustainability

1. Make progress towards the Grand Challenges

√- 1. Provide hazard and disaster information where and when it is needed.

√+ 2. Understand natural processes that produce hazards

√- 3. Develop hazard mitigation strategies and technologies

√ 4. Reduce vulnerability of interdependent critical infrastructure

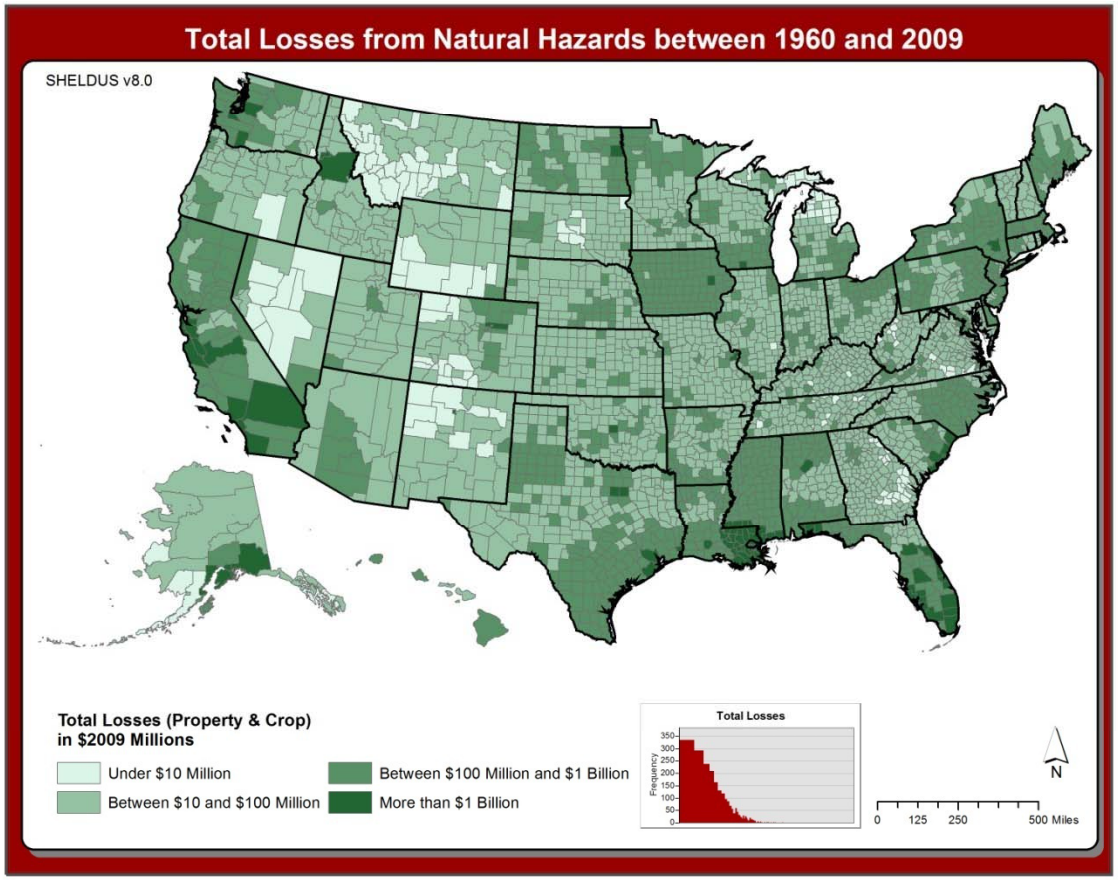
√- 5. Assess disaster resilience

√- 6. Promote risk wise behavior

Needs and Opportunities

Systematic inventory on losses (where, how much, causal agent)

- county-level natural hazard dataset
- 18 different natural hazard events types: avalanches, coastal hazards, droughts, earthquakes, floods, fog, hail, heat, hurricanes incl. tropical storms, landslides, lightning, severe storms, tornados, tsunamis & seiches, volcanic eruptions, wildfires, wind events, winter weather
- Version 8.0: 1960 through 2009
- about 650,000 records
- SHELDUS does not include Puerto Rico, Guam, or other U.S. territories.



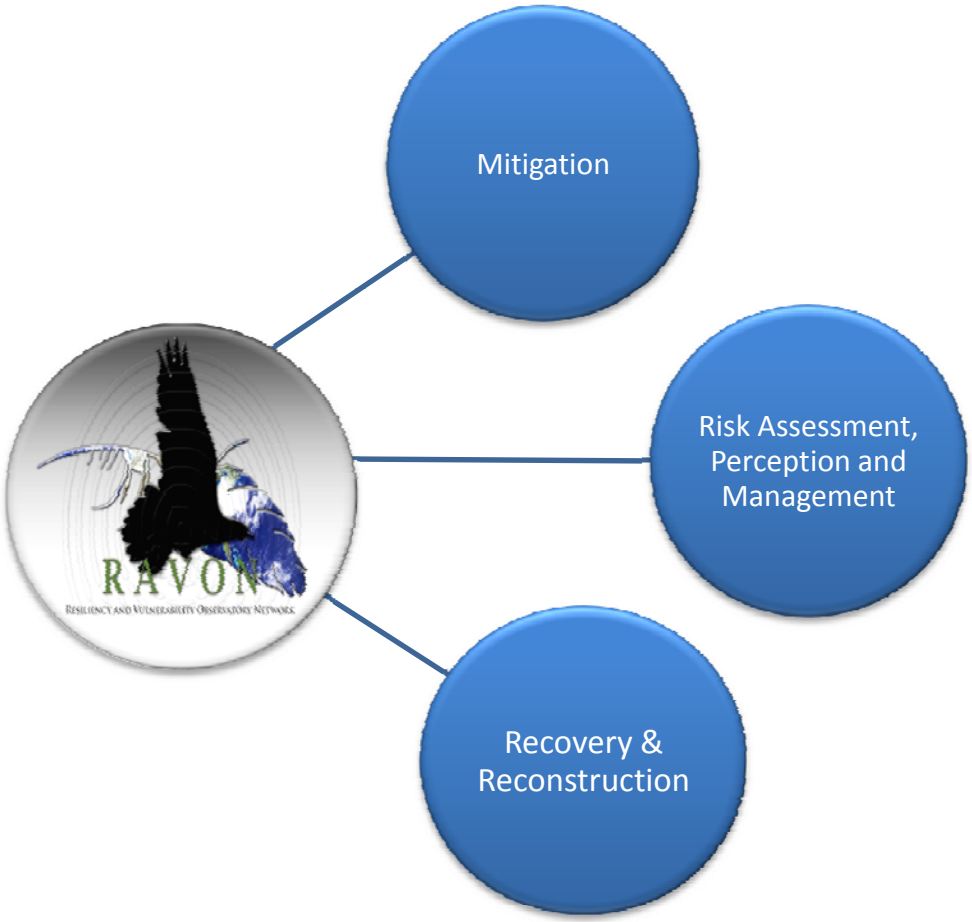
www.sheldus.org

Gall, M., K. Borden, and S. L. Cutter, 2009. "When do losses count? Six fallacies of natural hazards loss data," *Bulletin of the American Meteorological Societ*y 90 (6): 799-809.

Systematic and long-term data on the nature and dynamics of social systems and their built environment for predictive understanding of DRR

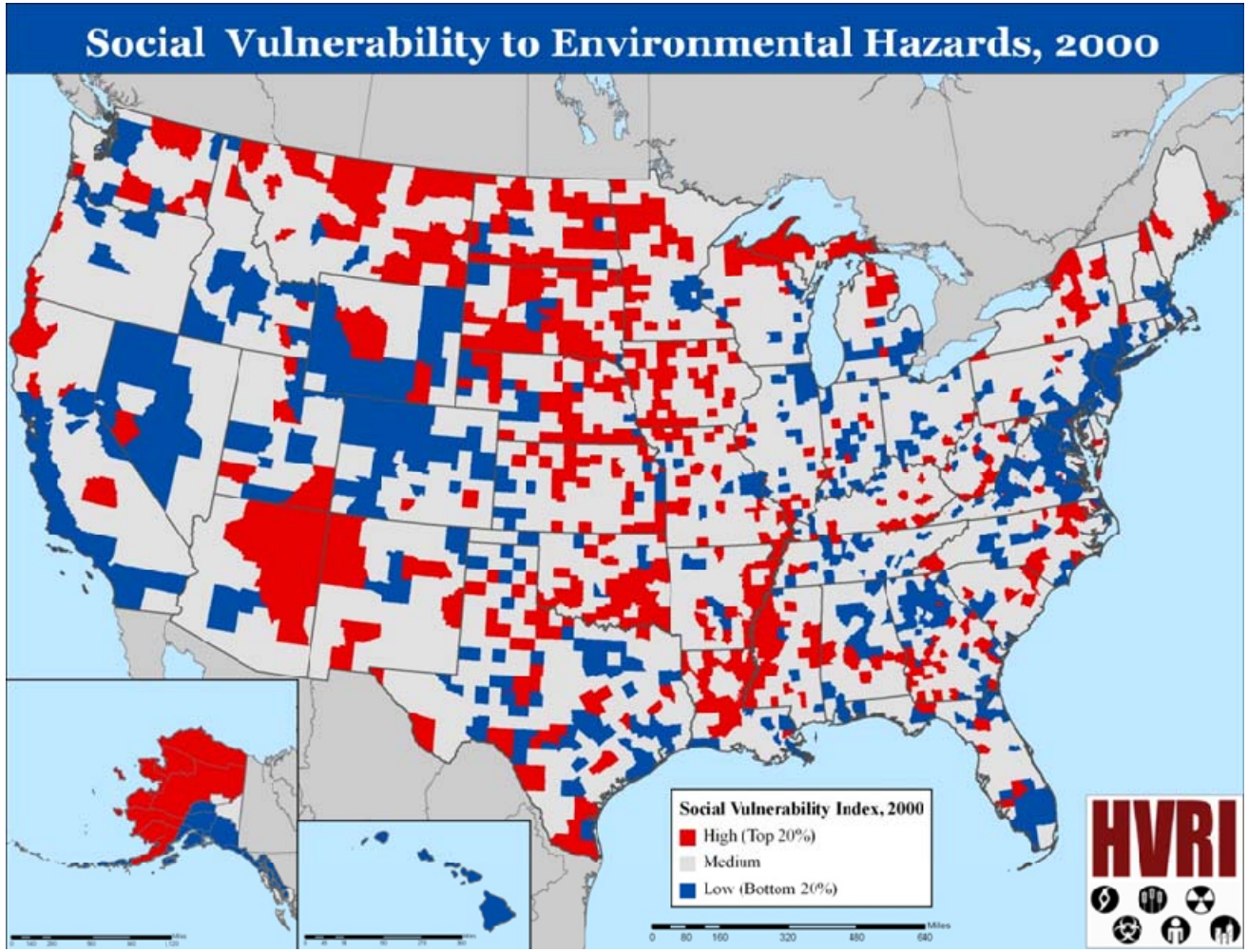
RAVON's Research Agenda:

- Conceptual clarification
- Monitoring
- Modeling, evaluation
- Data sharing/dissemination
- Post-event research

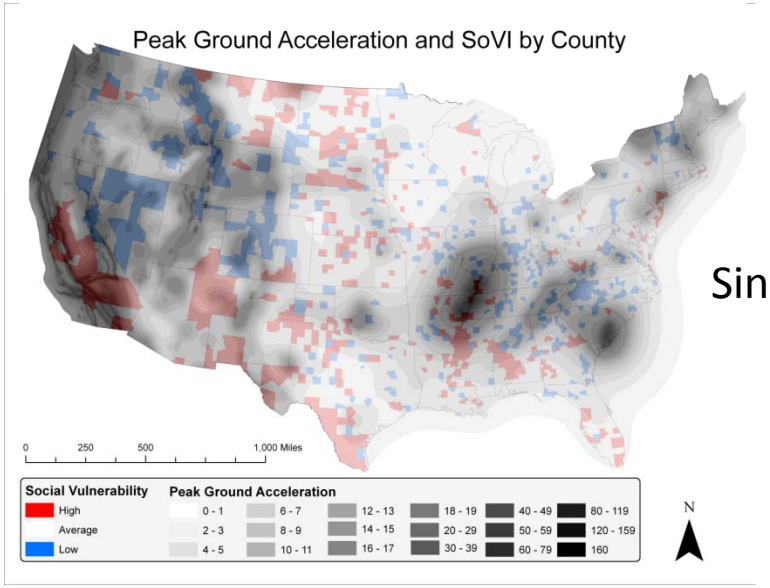


Consistent and comparable locally-based hazard vulnerability assessments

Measuring and mapping social vulnerability



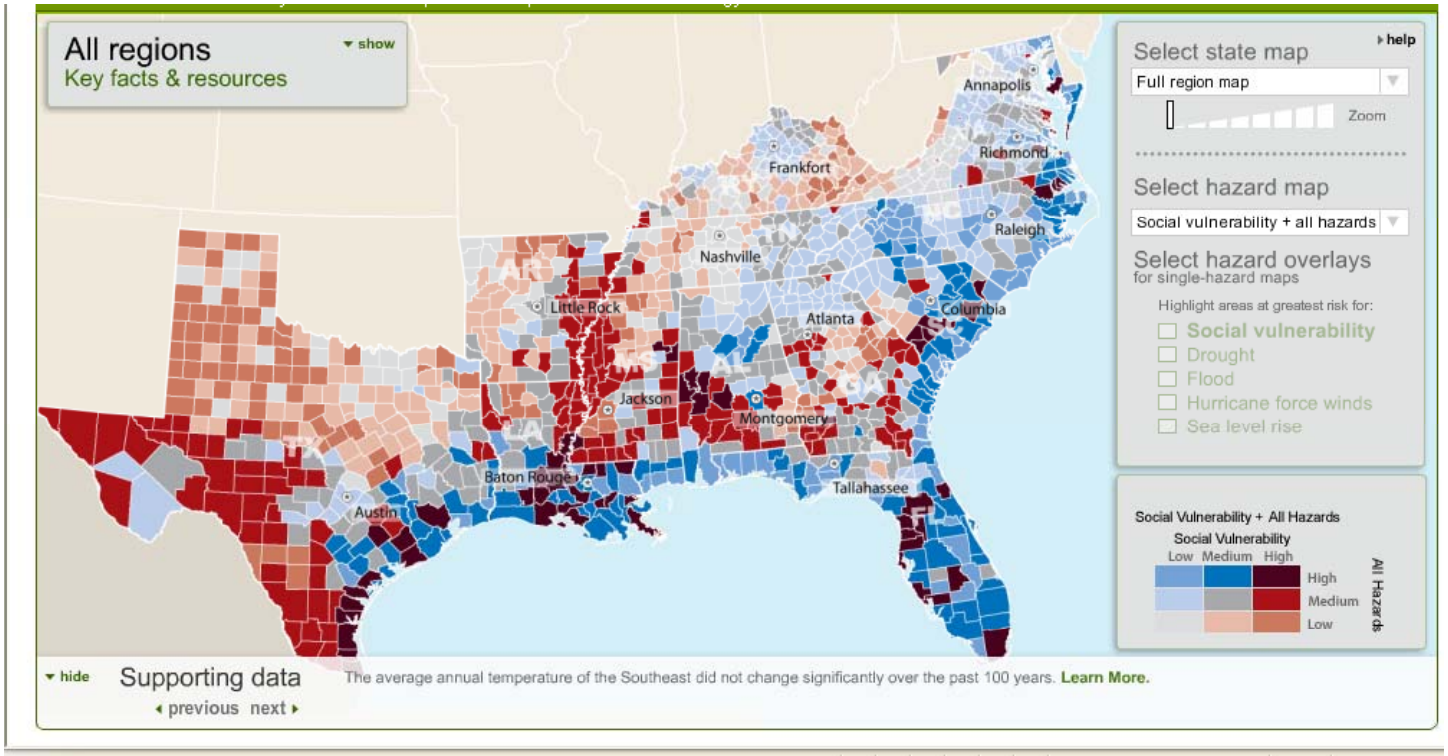
sovius.org



Single hazard

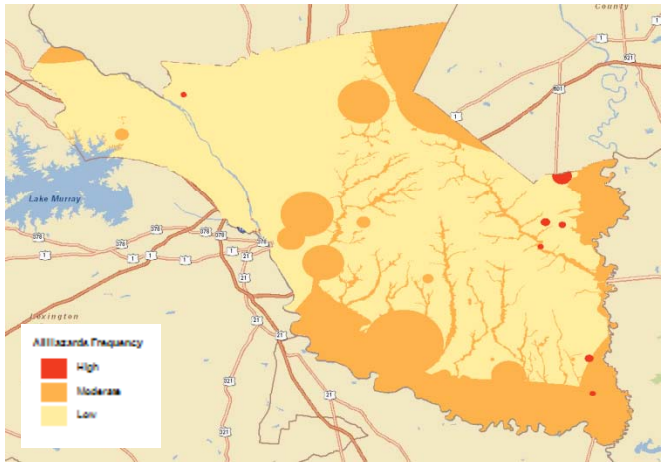
Integrating social vulnerability with hazard exposure

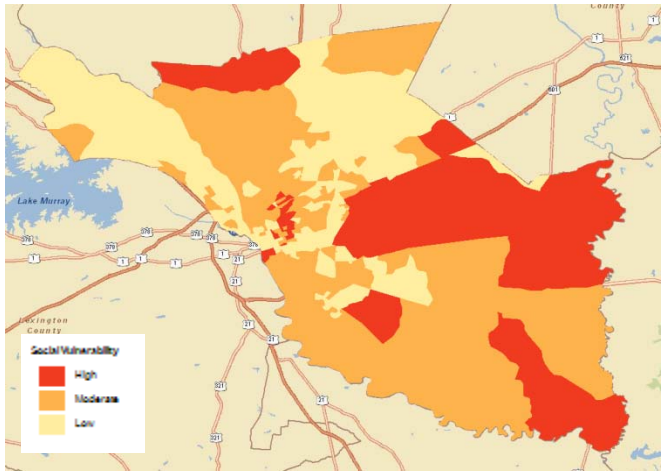
Multi-hazard



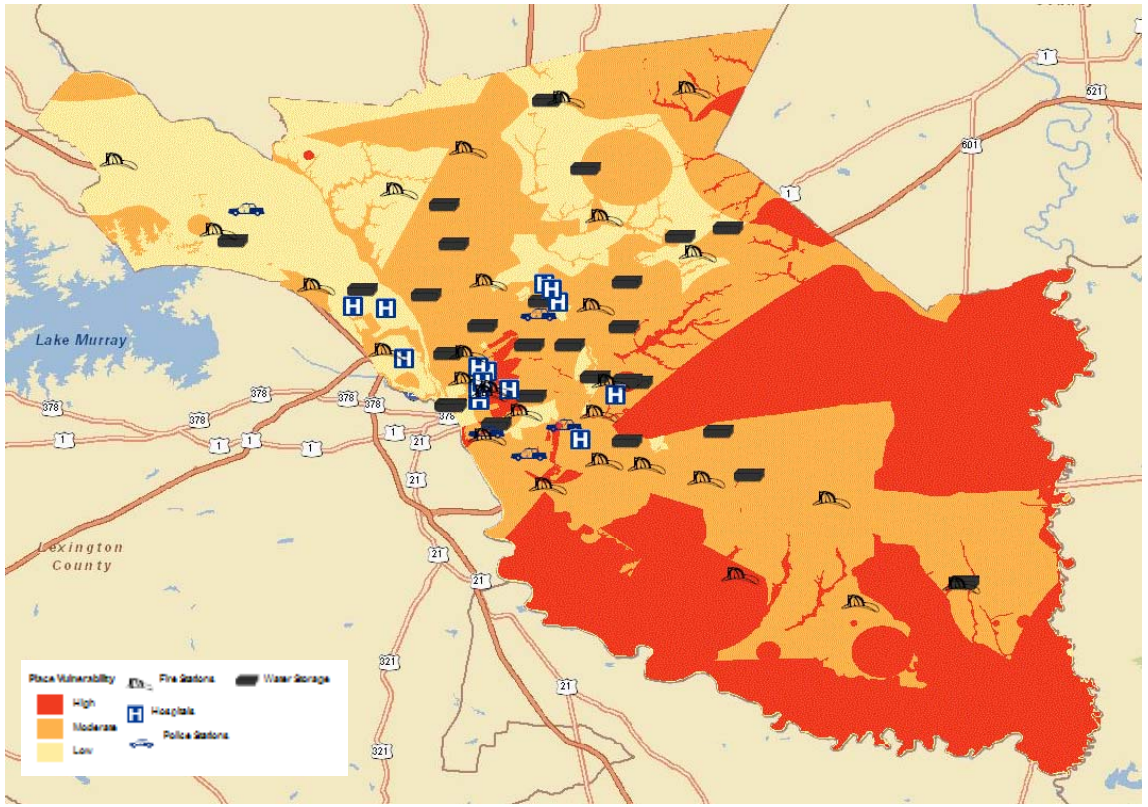
http://www.oxfamamerica.org/publications/exposed-social-vulnerability-and-climate-change-in-the-us-southeast

Downscaling to sub-county scales



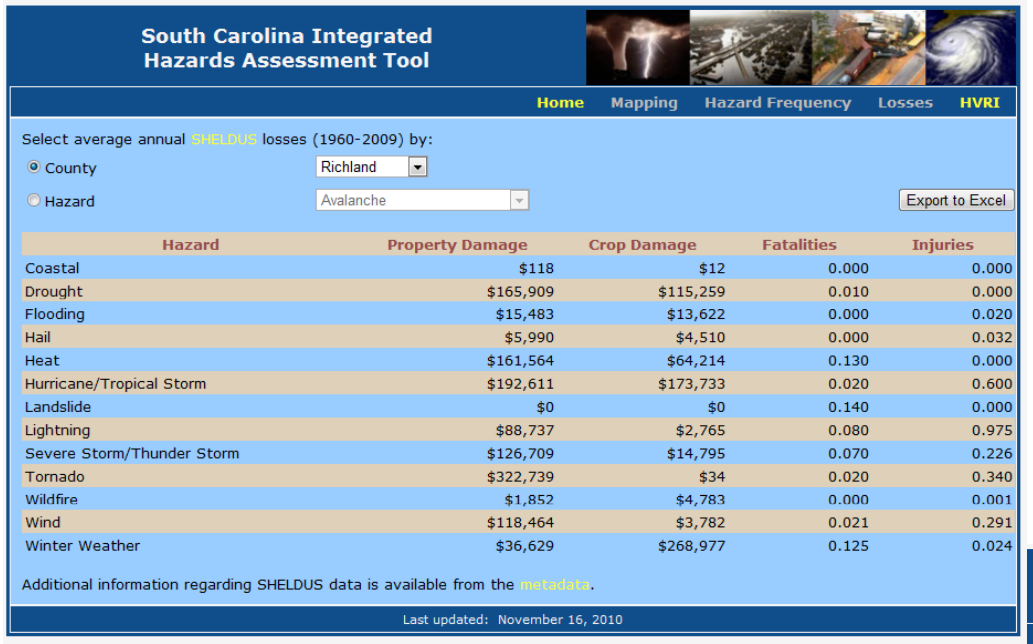


Integrated Hazard Assessment Tool (IHAT)
Beta Version 1.0



http://mapra.cas.sc.edu/ihat/index.html

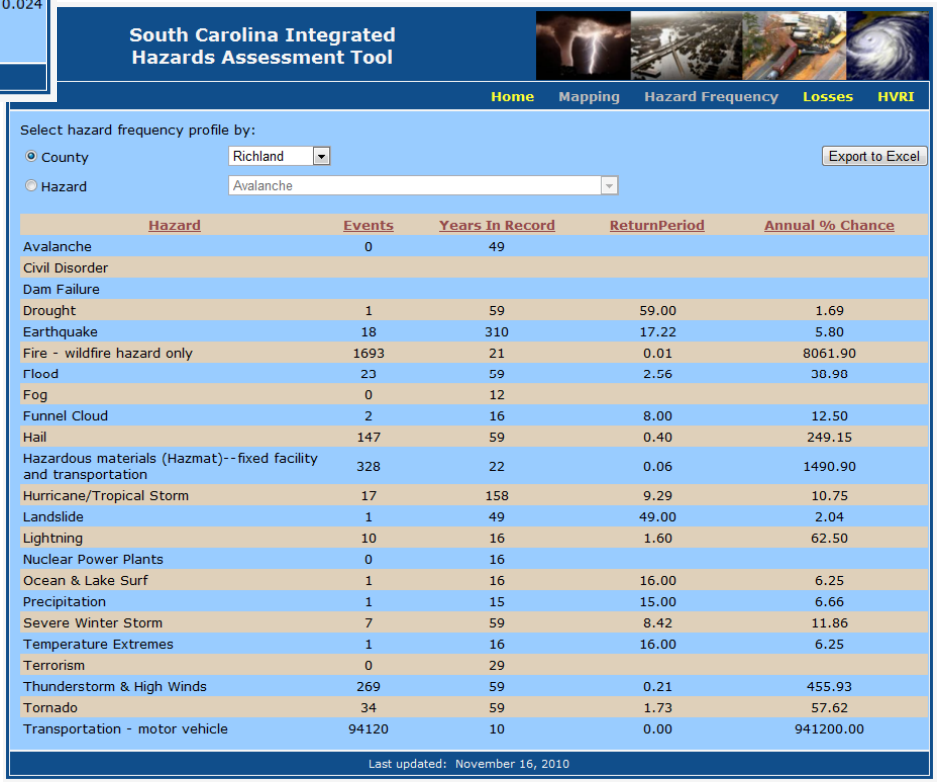
Tate, E., S. L. Cutter, and M. Berry, 2010. "Integrated multi-hazard mapping," *Environment and Planning B: Planning and Design* 37 (4): 646-663.



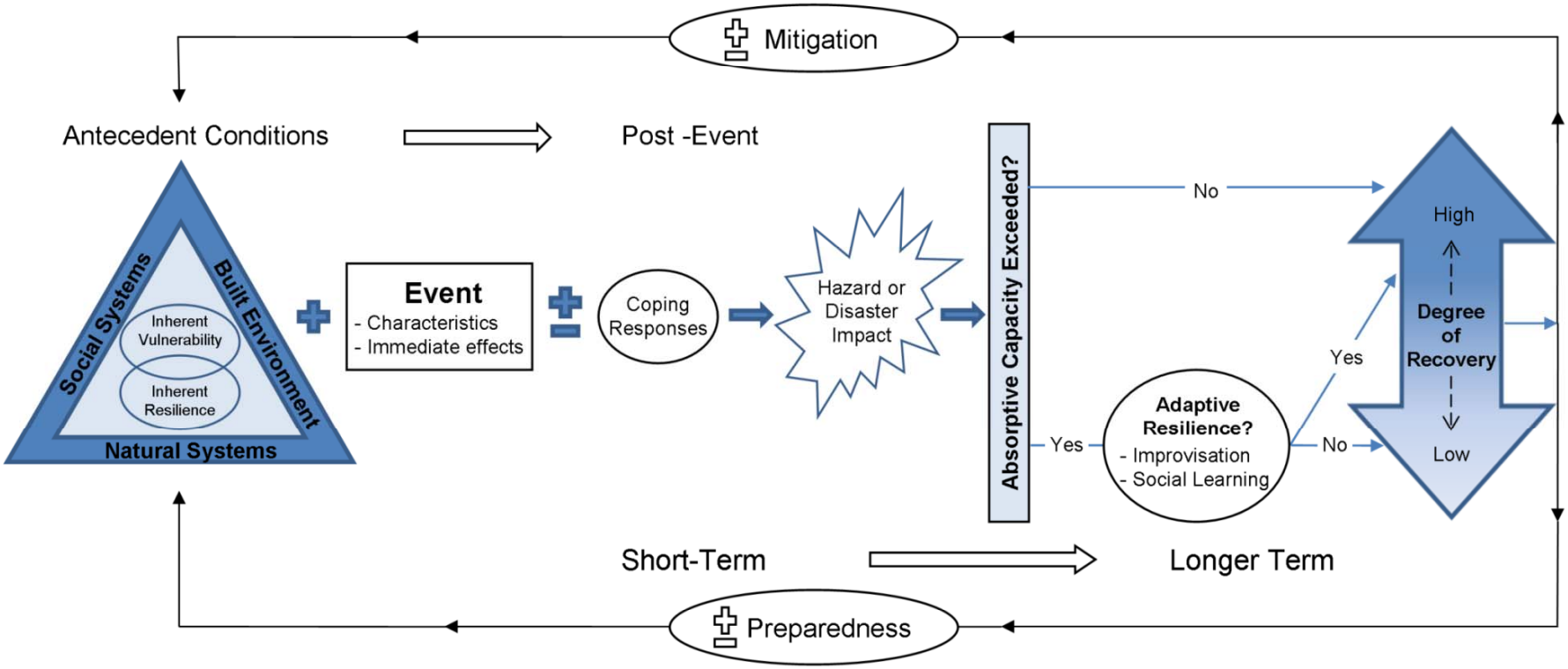
Associated Losses

Downscaling to sub-county scales

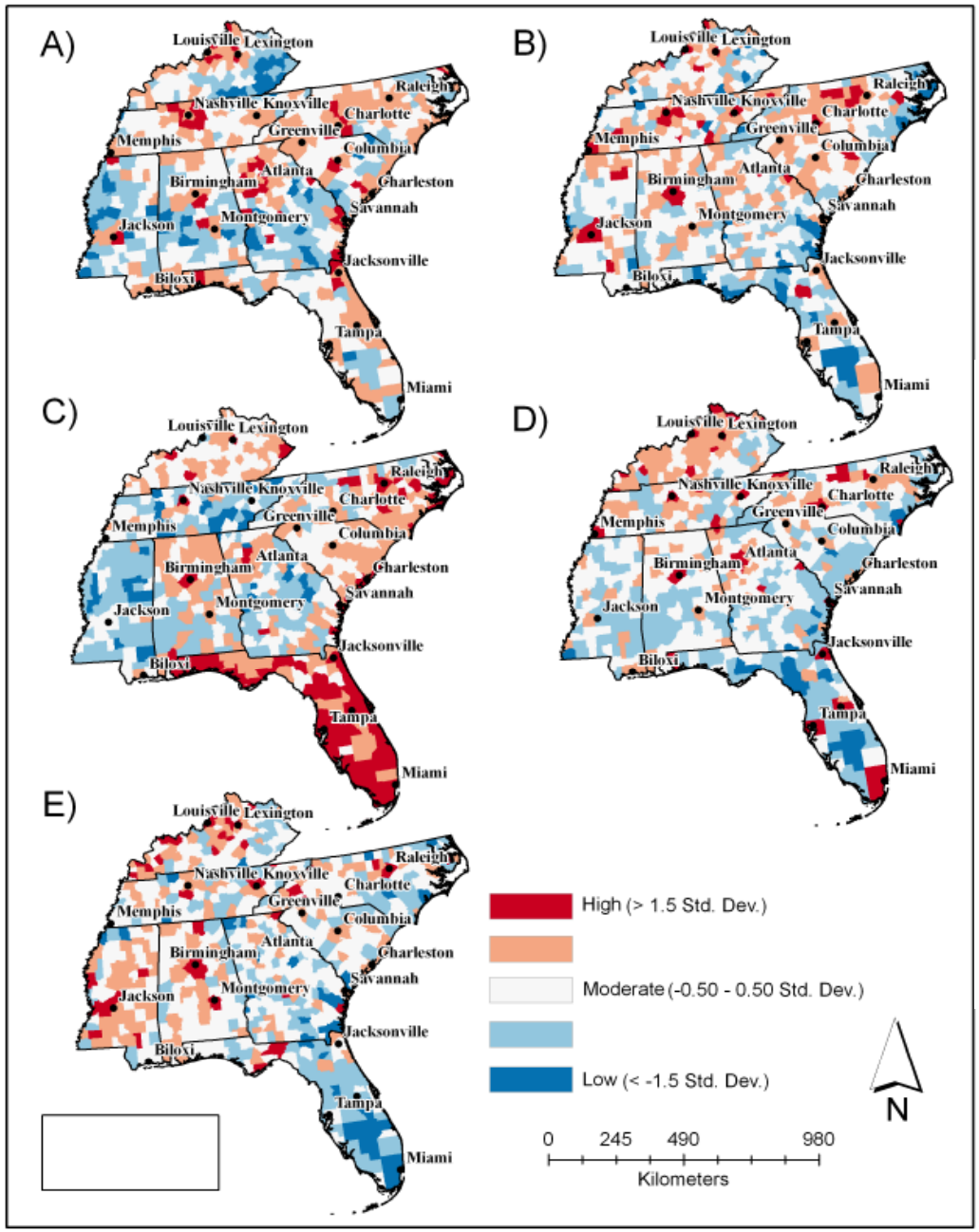
Frequency of Events



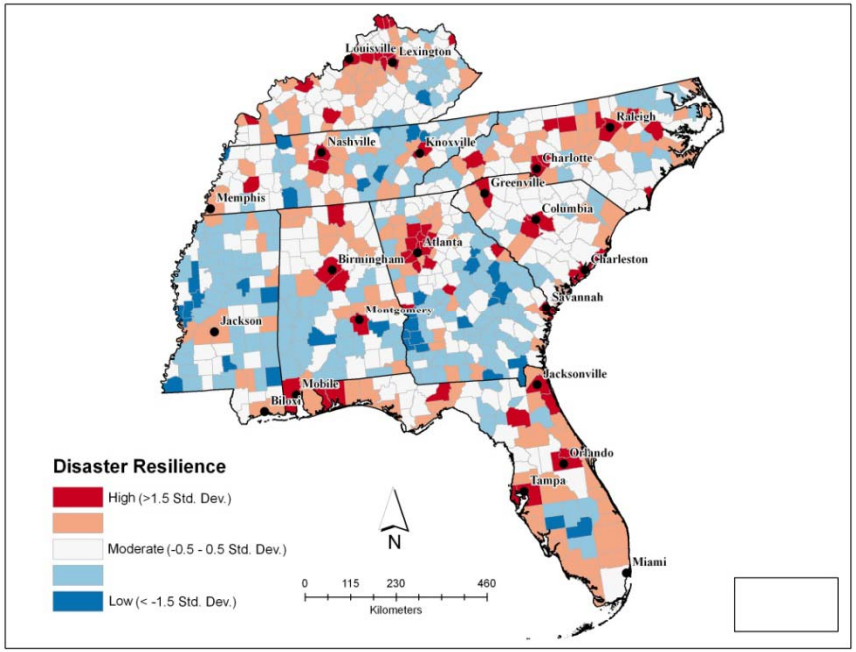
Evidence-based indicators to measure progress toward DRR and resilience



Cutter, S. L., L. Barnes, M. Berry, C. Burton, E. Evans, E. Tate, and J. Webb. 2008. A place-based model for understanding community resilience to natural disasters. *Global Environmental Change* 18 (4): 598-606.



A) Social
B) Economic
C) Institutional
D) Infrastructure
E) Community Capital



Cutter, S. L., C. G. Burton, and C. T. Emrich, 2010. "Disaster resilience indicators for benchmarking baseline conditions," *Journal of Homeland Security and Emergency Manage*ment 7(1): Article 51.

2. Develop a science action plan consistent with international efforts

Integrated Research on Disaster Risk

IRDR
Integrated Research on Disaster Risk

ICSU
International Council for Science

ISDR
International Strategy for Disaster Reduction

ISSC
international social science council

Key components—focus on risk and disaster risk reduction; need an integrated approach across hazards, disciplines, scales; recognize importance of data and information

Broad research objectives:

1. Characterization of hazards, vulnerability, and risk
2. Understanding decision making in complex and changing risk contexts
3. Reducing risks and curbing losses through knowledge-based actions
4. Cross cutting themes—case studies; assessment, data management and monitoring; capacity building

Partners: National and international science institutions; national and international development assistance agencies; National IRDR Committees

Some Specifics

National IRDR Committees

Establish US National Committee for IRDR
consistent with other countries

Members:
SDR (US Federal Agencies)
Disasters Roundtable
Major Multidisciplinary Disaster Research Centers :
Natural Hazards Center, Boulder
Disaster Research Center, Delaware
Hazards & Vulnerability Research Institute, South Carolina
Hazard Reduction & Recovery Center, Texas A&M
Others…..

IRDR Initial Projects

FORIN—IRDR forensic investigations

RIA—Risk interpretation and action

DATA—long-term databases

GAIRDR—Global assessment of integrated research on disaster risk

3. Awareness of Upcoming Reports

IPCC Special Report (SREX)

Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

Timeline:

April 2011 Government and expert review comments (2nd draft)

May 2011 Final drafts prepared

Oct 2011 SREX Final Government Distribution

Nov 2011 Joint WG1/WG2 session to approve SREX Summary for Policy Makers and underlying report

SREX Contents

Chapter 1:
Climate change: new dimensions in disaster risk, exposure, vulnerability, and resilience

Chapter 2:
Determinants of risks: exposure and vulnerability

Chapter 3:
Changes in climate extremes and their impacts on the natural physical environment

Chapter 4:
Changes in impacts of climate extremes: human systems and ecosystems

Chapter 5:
Managing the risks from climate extremes at the local level

Chapter 6:
Managing the risks from climate extremes at the national level

Chapter 7:
Managing the risks: international level and integration across scales

Chapter 8:
Toward a sustainable and resilient future

Chapter 9:
Case studies

http://www.ipcc-wg2.gov/AR5/extremes-sr/index.html

The National Academies, Committee on Science, Engineering, and Public Policy (COSEPUP)

Increasing National Resilience to Hazards and Disasters

Study statement of task

An ad hoc committee overseen through collaborative oversight of the Disasters Roundtable (DR) and the Committee on Science, Engineering, and Public Policy (COSEPUP) will conduct a study and issue a consensus report that integrates information from the natural, physical, technical, economic, and social sciences to identify ways in which to increase national resilience to hazards and disasters in the United States. In this context, "national resilience" includes resilience at federal, state and local community levels.

The ad-hoc committee will:

- Define "national resilience" and frame the primary issues related to increasing national resilience to hazards and disasters in the United States;
- Provide goals, baseline conditions, or performance metrics for resilience at the U.S. national level;
- Describe the state of knowledge about resilience to hazards and disasters in the United States;
- Outline additional information or data and gaps and obstacles to action that need to be addressed in order to increase resilience to hazards and disasters in the United States;
- Present conclusions and recommendations about what approaches are needed to elevate national resilience to hazards and disasters in the United States.

Study Sponsors (as of September 2010)

Department of Agriculture/Forest Service
Department of Energy
Department of Homeland Security
DHS/Federal Emergency Management Agency
Department of the Interior/U.S. Geological Survey
National Aeronautics and Space Administration
National Oceanic and Atmospheric Administration
U.S. Army Corps of Engineers
Community and Regional Resilience Institute (CARRI)

Members

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Ellis M. Stanley, Sr., *Dewberry, Los Angeles, CA*
Gene Whitney, *Congressional Research Service, Washington, DC*
Mary Lou Zoback, Risk Management Solutions*, Newark, CA*

General Study Timeline

- January – May 2011: 2-3 committee meetings offsite
  - New Orleans-Biloxi (January)
  - Cedar Rapids-Iowa City (March)
  - Irvine (May)
- May – June 2011: Mid-term commissioned report to sponsors and public (written by rapporteur to capture content from one or more committee meetings)
- August – September 2011: Final committee meeting (final writing meeting)
- October 2011 – January 2012: Committee report to review and response to review
- February 2012: Delivery of pre-publication report to sponsors and public release
- February 2012 and beyond: Report dissemination, derivative products

To provide **actionable** recommendations and guidance on the best approaches to take to reduce human losses from hazards and disasters by increasing national resilience at the local community, state, and federal levels.

Questions???

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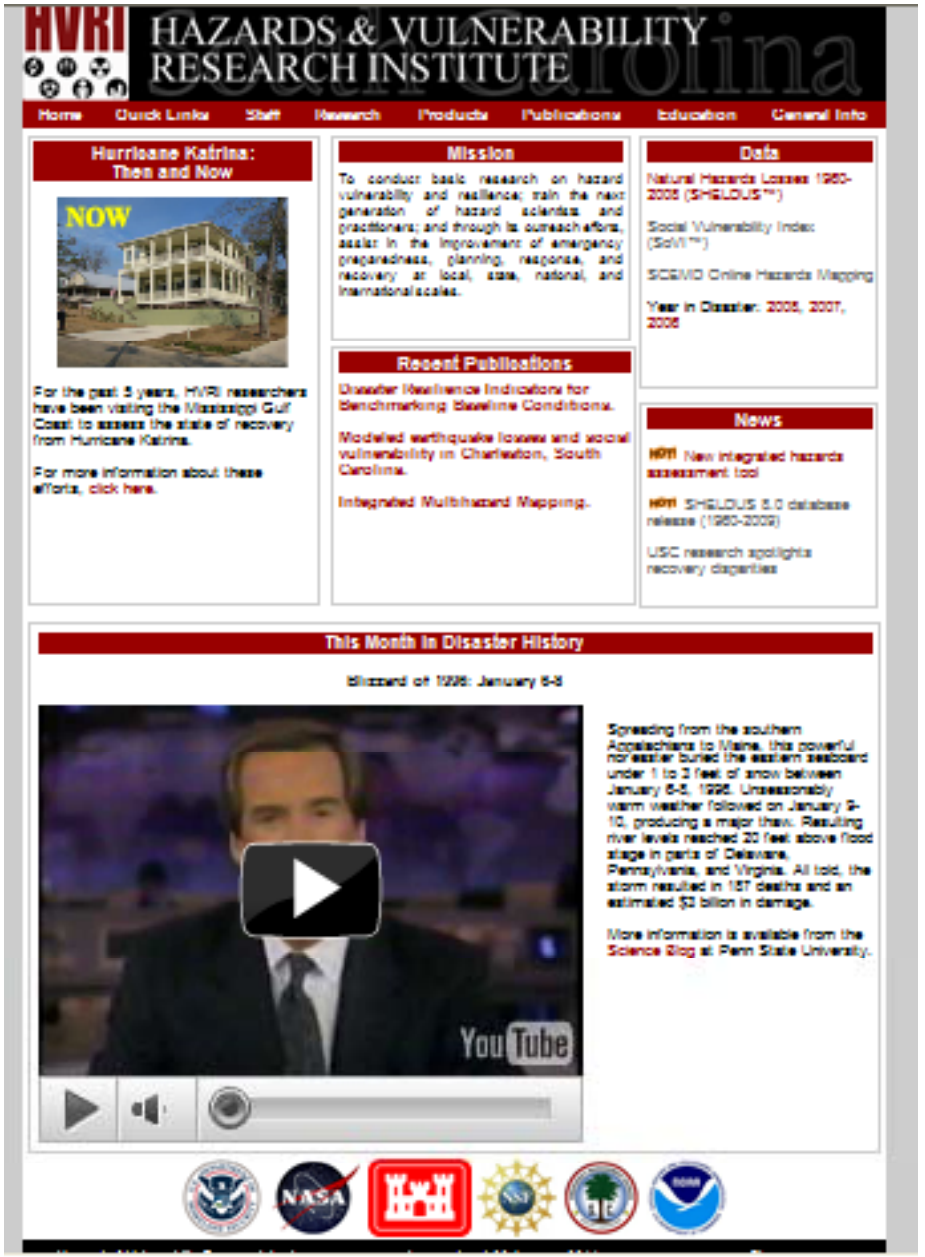

http://webra.cas.sc.edu/hvri/