

**The Department of Homeland Security Center of Excellence
Natural Disasters, Coastal Infrastructure and Emergency Management
(DIEM)**

RESEARCH FOCUS AREA:

Planning for Resilience

The coastal resilience and emergency management problem is two-fold. First, current plans, institutions, and risk assessment tools are inadequate to manage existing coastal hazards. Second, changes in the coastal environment are increasing the potential impact of natural hazards. To meet these challenges, the coastal emergency management system requires a top to bottom review. The nation needs to build a *resilient and sustainable coast* able to successfully adapt to twenty-first century challenges posed by natural hazards, climate change, and growth on the coastal urban interface. Effective adaptation strategies require a far-reaching transformation in coastal management plans, tools, and institutions.

Two projects allow us to initiate part of our larger strategy. First, we analyze the quality and variability of state and local hazard mitigation plans in coastal states, identifying how well partnerships, plans and polices (incentive and regulatory) perform based on established resiliency criteria. Next, we develop an improved method to analyze hazard risk, create a strategy to employ the improved approach, and develop a training program to inform end users. We are also pursuing funds to conduct additional research, which builds on these two projects, that would: 1) conduct a national audit of the emergency management system by evaluating federal, state, and local hazard mitigation, response, and recovery planning processes and plans based on coastal resilient criteria; 2) develop a new generation of fully enabled web-based planning support modeling tools; and 3) finalize and implement new tools and models through dissemination to policy makers and community user groups.

Analysis of Federal Mitigation Policy in the U.S.: Mitigation Plans, Expenditures, Civic Engagement, and Local Capability

Project Leaders: Philip Berke, UNC-CH, Institute for the Environment, Department of City & Regional Planning; Gavin Smith, UNC-CH, Center for Natural Disasters, Coastal Infrastructure and Emergency Management, Department of City & Regional Planning

Project Description: We will examine the quality and variability of the effects of local hazard mitigation plans produced under the Federal Disaster Mitigation Act (DMA) of 2000. The nation is making a major investment in hazard mitigation planning since adoption of this legislation. DMA strongly encourages all local governments to prepare hazard mitigation plans based on a participatory process and technical vulnerability analysis. These plans identify and prioritize a range of incentives and disincentives that local governments can apply to influence development patterns in hazardous locations. Once DMA plans are in place local governments become eligible for pre- and post-disaster federal mitigation funds.

Analytical Approach: This study examines the factors motivating local jurisdictions to voluntarily adopt DMA plans, enact incentives/disincentives, and use federal funds to mitigate hazards. Specifically, we propose to examine variability of these community mitigation efforts through indicators of the planning process that include design of local civic engagement programs, local jurisdiction commitment to mitigation, availability and quality of scientific information on vulnerability, strength of state mitigation plans and programs, severity of local risk, and prior disaster losses.

Data Collection: We will conduct a survey based on probability sampling of local governments by state, and analysis of data on DMA plans, incentive and disincentive policies enacted, mitigation expenditures, and theoretically important determinants. Samples of local governments will be drawn from three groups of states: states that mandate local land use plans, states with incentives for local land use planning, and states without mandates and incentives. We will apply the technique known as content analysis to the DMA plans identified. These data can be mapped to illustrate distribution of the strength of DMA local plans and outcomes spatially. Statistical techniques will be used to assess specific factors quantitatively and identify targeted case studies. Selected local case studies will provide an in-depth examination of these relationships.

Measurable Goals: 1) Describe state mitigation plans, laws, and programs; 2) Assess quality and outcomes of local hazard mitigation plans; 3) Determine most important determinants that explain variability in quality of local mitigation plans and effectiveness of outcomes; and 4) Develop theoretical and policy-relevant recommendations.

Risk Based Planning

Project Leaders: William L. Waugh, Jr., Georgia State University

Project Description: The National Fire Protection Association states that emergency management programs “shall identify hazards, monitor those hazards, the likelihood of their occurrence, and the vulnerability of people, property, the environment, and the entity [program] itself to those hazards” (NFPA 1600, Standard 5.3, 2007). The same requirement is in the Emergency Management Accreditation Program standards (EMAP 2007) for public sector emergency management programs. This project is a critical evaluation of risk-based planning and how it can be improved

Dennis Mileti's *Disasters by Design* makes the case for encouraging local resiliency and responsibility for disasters by recognizing hazards and finding a level of risk with which they can live. Encouraging risk reduction while still being sensitive to community preferences is extremely difficult. Land-use planning focused on sustainability is the goal. In some measure, achievement of the goal will require effective collaboration within the governmental and nongovernmental networks that influence land-use, zoning, building code adoption, and building standards. This project will examine the experience in communities and states with major disasters and in those without such experience. The foci will be on differences in risk perception, public participation in risk-related policy decisions, community vulnerability to hazards, and adoption of appropriate land-use measures to reduce hazards before and after catastrophic disasters.

Analytical Approach: This project will involve the development of (1) a practical methodology for hazard identification and analysis, risk assessment, impact analysis, and cost-benefit analysis; (2) a strategy for carrying out the methodology at the community and state levels using risk analysis information to inform resource allocations and land-use decisions; and (3) a training program for local and state officials in the use of the methodology.

Data Collection: Data on risk measurement methodologies will be done through a review of the academic and practitioner literatures. Interviews and at least one focus group session will be conducted at the International Association of Emergency Managers and ICMA national conferences. Interviews of urban planners, members of community planning groups, and state hazard mitigation planners will be conducted to determine where risk information might be used to reduce community vulnerabilities.

Measurable Goals: The goals are the development of (1) a practical methodology for hazard identification and analysis, risk assessment, impact analysis, and cost-benefit analysis; (2) a strategy for implementation of a program to inform state and local decision making regarding risks; and (3) a training program for local and state officials.