Research Summary

Evaluation of Local Hazard Mitigation Plan Quality

Authors

Ward Lyles
(wlyles@unc.edu) is a Graduate Research Assistant at the Department of City and Regional Planning at the University of North Carolina at Chapel Hill and the Institute for the Environment.

Philip Berke
(pberke@unc.edu) is a Professor in the Department of City and Regional Planning at University of North Carolina at Chapel Hill and the Deputy Director of the Institute for the Environment.

Gavin Smith
(gavin_smith@unc.edu) is an Associate Research Professor in the Department of City and Regional Planning and the Executive Director of the Department of Homeland Security's Coastal Hazards Center at the University of North Carolina at Chapel Hill.

The Disaster Mitigation Act of 2000 requires all local governments to adopt hazard mitigation plans to remain eligible for certain federal disaster funds. These plans are a critical piece of efforts to reduce natural hazard risks and increase long-term resiliency. Based on seven principles of plan quality, a sample of 175 local mitigation plans are content analyzed.

Research Questions

(1) How well do local plans prepared under the DMA act achieve the principles of plan quality?
(2) What are the comparative strengths and weaknesses of local plans across six coastal states?

Methodology

A random sample of plans for 175 local jurisdictions in six states was content analyzed to determine the quality of the plans for the seven principles outlined below. The sampling represents diverse geographic locations and has wide variation in population growth and development rates. Content analyzing the plans involved independent double-coding of each plan using a coding protocol, which was developed and refined through pre-testing and consisted of multiple items for each principle. We calculated standardized index scores on 0-10 scales (0 = low score, 10 = high score) for each of the seven principles for individual plans; average scores are presented for each state.

Plan Quality Principles

Participation	Involves recognition of formal and informal actors engaged in preparing the plan, including other governmental bodies, private-sector institutions, nonprofits, and individual citizens.
Fact Base	Provides the empirical foundation to ensure that key hazard problems are identified and prioritized and mitigation policy-making is well-informed.
Goals	Future desired conditions that reflect the breadth of values affected by the plan.
Policies	Serve as a general guide to decisions about development and assure that plan goals are achieved.
Implementation	Involves the assignment of organizational responsibilities, timelines, and funds to implement the plan.
Monitoring	Involves tracking the extent to which polices are carried out.
Inter-Organizational Coordination	Entails recognition of the interdependent actions of state and local organizations that need coordination for plan implementation.

COASTAL HAZARDS CENTER
A U.S. Department of Homeland Security Center of Excellence

Coastal Hazards Center
University of North Carolina at Chapel Hill
100 Europa Drive, Suite 540
Campus Box 7581
Chapel Hill, NC 27517-7583

UNC Institute for the Environment
University of North Carolina at Chapel Hill
137 E. Franklin Street
Campus Box 6116
Chapel Hill, NC 27599-6116

UNC INSTITUTE FOR THE ENVIRONMENT

Findings: Local Hazard Mitigation Plan Quality

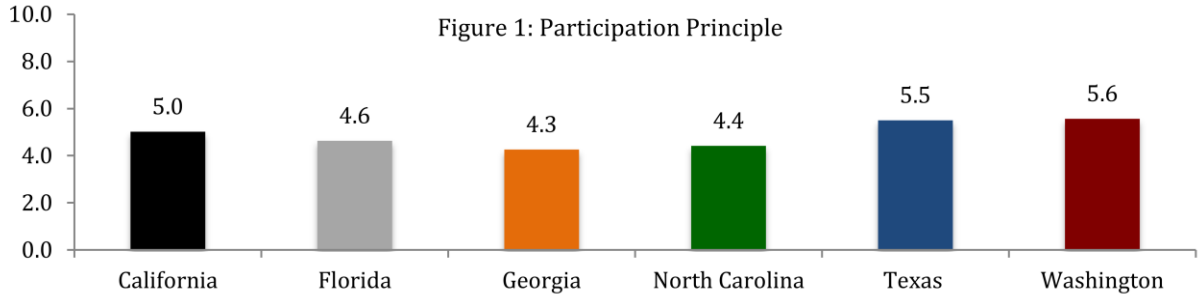
The findings are organized by the sections required by FEMA (i.e. planning process, risk assessment, mitigation strategy, and plan maintenance), under which the relevant principles of plan quality are presented.

FEMA SECTION: Planning Process

Plan Quality Principle: Participation

The planning process section of the FEMA requirements aligns directly with the participation principle of plan quality and consists of a description of the planning process and the public engagement techniques used in the process. Most plans provided a detailed description of the planning process and most indicated use of public notices and public meetings, as shown in Figure 1. However, few plans noted that targeted outreach (e.g. focus groups and surveys) or citizen advisory committees had been used. Jurisdictions in Texas and Washington scored the highest for the participation principle, due in part to planning processes in those states including targeted outreach and websites designed to engage the public.

Figure 1: Participation Principle



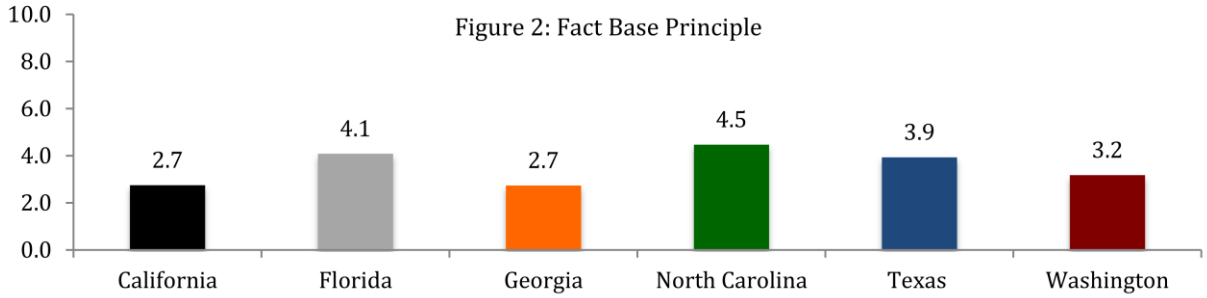
* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

FEMA SECTION: Risk Assessment

Plan Quality Principle: Fact Base

FEMA's requirements include identifying and profiling hazards, assessing vulnerability, and assessing risks. To these requirements, we add assessing existing mitigation capabilities (e.g. policies, programs, and resources). Most plans had low quality fact bases on average, as indicated by all states having average scores less than 5.0 out of 10.0 possible (Figure 2). Jurisdictions in Florida and North Carolina, which have strong traditions of planning and planning for hazards in particular, have the highest scores, followed by jurisdictions in Texas.

Figure 2: Fact Base Principle



* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

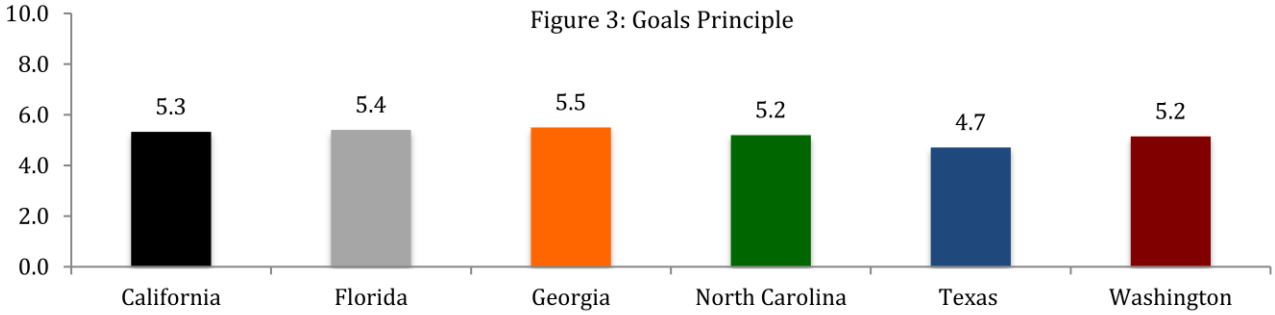
FEMA SECTION: Mitigation Strategy

FEMA requirements for mitigation strategies include local hazard mitigation goals, identification of mitigation actions (policies), and implementation of mitigation actions.

Plan Quality Principle: Goals

The overall average goals scores in the states indicate moderate quality for goals (Figure 3). The most common goals were reducing property damages, protection public safety and increasing availability of information,

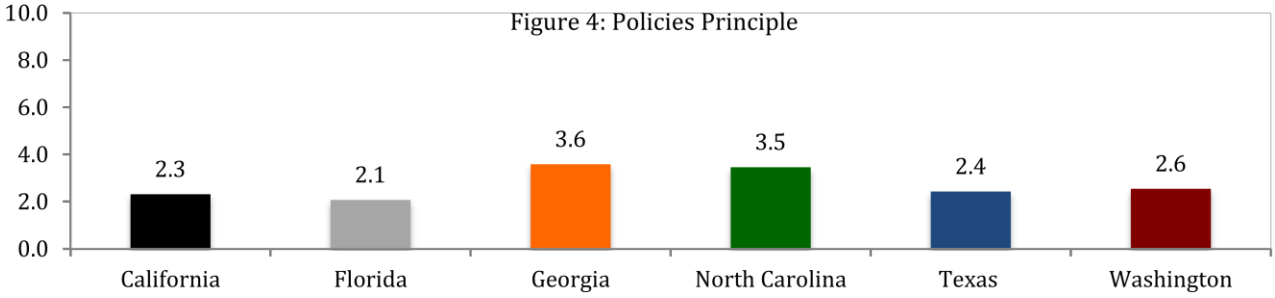
while goals related to increasing resilience and sustainability and reducing inequitable distribution of impacts were least common. The states' average goals scores are very similar.



* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

Plan Quality Principle: Policies

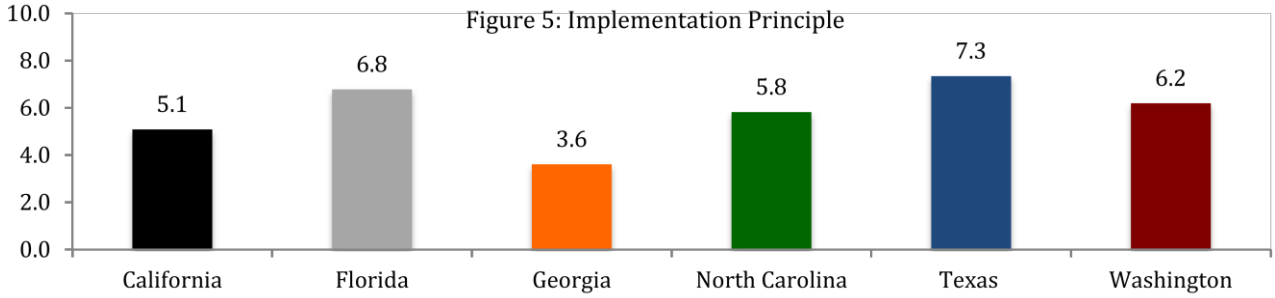
The policies principle consists of the following types of mitigation approaches: property protection, public information and awareness, preventative land use, emergency services, structural controls, post-disaster recovery, and protection of natural mitigation features. Most jurisdictions include a narrow range of policies, as indicated by the average scores approximating one-third to one-quarter of the 10.0 possible (Figure 4). Georgia and North Carolina include the widest range of policies, while California, Florida, and Texas include the narrowest ranges.



* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

Plan Quality Principle: Implementation

The implementation principle consists of identification of the responsible agency, timeline, and expected cost for policies proposed in the mitigation strategy. The average scores indicate moderate to high levels of inclusion of information about agencies responsible, timelines and costs for actions proposed in mitigation strategies (Figure 5). Jurisdictions in Florida and Texas have the highest average implementation scores. This is likely because their plans include a narrow range of project-oriented approaches with responsible agencies, timelines and costs that are relatively straightforward to determine.



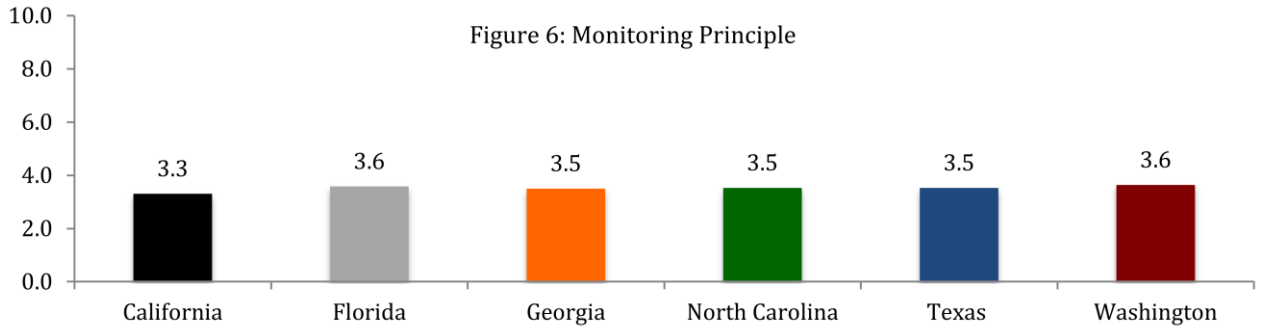
* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

FEMA SECTION: Plan Maintenance

FEMA requirements include monitoring, evaluating and updating the plan, incorporating the plan into existing planning mechanisms, and continued public involvement, which aligns with the monitoring and inter-organizational coordination principles.

Plan Quality Principle: Monitoring

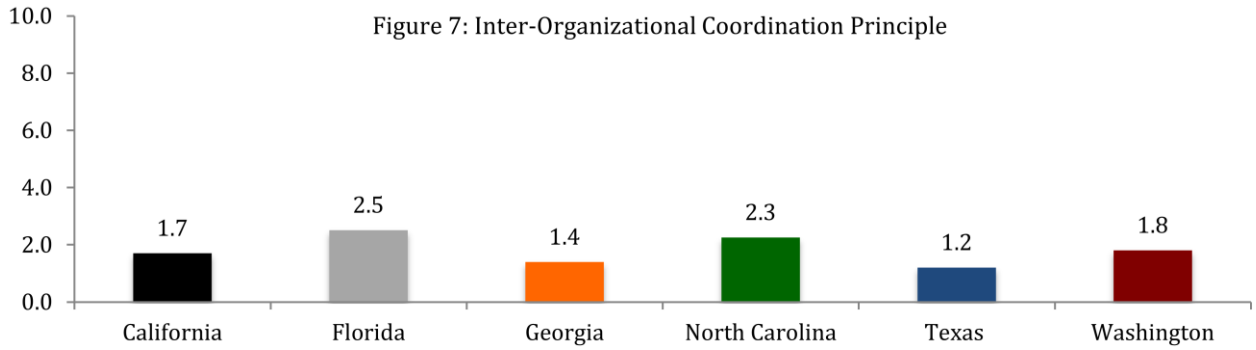
The monitoring principle consists of identifying parties to be involved in future plan updates, indicators to be used in monitoring and identifying obstacles to implementation. The plans have low scores on average in each of the six states (Figure 6). Almost all plans identify the agency with lead responsibility for monitoring the plan and indicate that the public will be involved in future monitoring and updating of the plan. However, very few plans include indicators for tracking progress or identify obstacles to implementation faced in the past. There is little variation across the states.



* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

Plan Quality Principle: Inter-Organizational Coordination

The inter-organization coordination principle consists of conflict resolution procedures and coordination of the mitigation plan with other plans. Average inter-organizational coordination scores are very low, or below one-quarter of the total possible score, indicating that all plans did a poor job of linking mitigation to other planning initiatives (Figure 7). While all the states' average scores are low, Florida and North Carolina have the highest average scores due to provision of more detail about comprehensive plans, and in Florida, the prevalence of descriptions of how conflicts in ongoing implementation would be resolved.



* Scores are all standardized on a scale of 0 to 10; 0 = low score and 10 = high score.

Summary of Findings

Local hazard mitigation plan quality is moderate to weak overall and varies widely across the principles of plan quality and across the six states in our study. The highest scoring principles (i.e. goals, participation and implementation) indicate that jurisdictions are paying attention to critical planning issues, although even for

these high scoring principles considerable room for improvement remains. The low scores on four of the seven principles (fact base, policies, monitoring and inter-organization coordination) point to major weaknesses that need to be addressed in future five-year updates to local plans.

This study clearly indicates that the quality of local mitigation planning needs improvement in critical areas. These improvements include adopting broader sets of mitigation approaches (i.e. policies and principles), better coordinating mitigation with other planning initiatives, and improving monitoring provisions.

Implications for Practice

Based on these findings, the following recommendations are offered for how plan quality evaluation can be used to guide and monitor development of local hazard mitigation plans.

- **Plan quality evaluation is a valuable tool for systematic analysis of plans.** Application of the plan quality principles allows for empirical documentation of patterns of gaps and weaknesses in current plans, thereby providing insights on how these plans can be improved.
- **Application of plan quality principles can allow for improved assessment of plans**. By applying plan quality principles, local hazard mitigation plans can be more effectively reviewed as part of FEMA's plan update cycle for mitigation plans and following disasters.
- **Applying plan quality principles allows for comparative analysis across jurisdictions**. This may be particularly useful for the higher-level external review conducted by FEMA while helping states develop targeted local capacity building strategies. The findings can also provide FEMA and states with tangible measures to make improvements in enabling legislation and administrative rules that guide plan making, and the delivery of technical assistance.

Full Article

The full version of this publication and others are available at http://hazardscenter.unc.edu/mitigation-planning/ and at http://www.ie.unc.edu/cscd/projects/dma.cfm.

Additional Information

More about the Coastal Hazards Center and its work can be found at http://hazardscenter.unc.edu. More about the Institute for the Environment and its work can be found at www.ie.unc.edu.

Acknowledgements

This material is based upon work supported by the U.S. Department of Homeland Security Coastal Hazards Center under Award No. 00313690. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, express or implied, of the U.S. Department of Homeland Security.

COASTAL HAZARDS CENTER

Coastal Hazards Center
University of North Carolina at Chapel Hill
100 Europa Drive, Suite 540
Campus Box 7581
Chapel Hill, NC 27517-7583

UNC Institute for the Environment
University of North Carolina at Chapel Hill
137 E. Franklin Street
Campus Box 6116
Chapel Hill, NC 27599-6116

UNC INSTITUTE FOR THE ENVIRONMENT