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The Role of the State in Building Local Capacity and Commitment for Hazard Mitigation Planning

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State governments play an important, but little understood, role in hazard mitigation through the use of a number of capacity building initiatives intended to assist communities develop hazard mitigation plans and policies. The passage of the Disaster Mitigation Act of 2000 more than 10 years ago provides a baseline from which to assess the degree to which states have developed and applied the tools, funding mechanisms, programs, and policies to help communities achieve this important objective. In this article, several state-level measures are analyzed and discussed relative to the degree to which they facilitate an enhanced local capacity to engage in hazard mitigation activities, including planning. The measures include: state hazard mitigation staffing; state hazard mitigation funding, policies, and programs; state cost-sharing of hazard mitigation programs; and state delivery of hazard mitigation technical assistance. The findings suggest that states maintain a wide variation in state capacity and commitment to support local hazard mitigation activities, including that which is influenced by disaster-based funding. They also tend to emphasize building local governments' capacities to gain access to project funding rather than focusing on helping them identify and establish a comprehensive, proactive, and sustained risk reduction strategy grounded in land use policy. In addition, state land use policies are not well integrated into state hazard mitigation plans and capacity building initiatives. Finally, state mitigation officials believe that most local governments do not possess the capacity or commitment necessary to develop sound hazard mitigation plans or administer hazard mitigation grants.

Keywords: State hazard mitigation planning and policy, building local capacity and commitment, Disaster Mitigation Act of 2000.

Introduction and Background

States play a number of important roles in guiding and supporting local hazard mitigation actions that reduce long-term risk to people and property from hazards. State activities that advance local hazard mitigation include serving as a transmitter of information (e.g., new federal and state policies and rules), provider of data, creator of policy, intermediary between federal policies and local actions, evaluator of local hazard mitigation plans and hazard mitigation grant applications, and builder of local capacity and commitment to hazard risk reduction initiatives through state-level training and outreach programs (Godschalk et. al 1999; Smith 2011; Smith and Wenger 2006, p. 242-245; Waugh and Sylves 1996). State mitigation efforts can also foster intergovernmental coordination (Burby and May 1997, p. 141-142; Burby and May 2009), enhance local plan compliance with broader state goals (Godschalk, Brower, and Beatley 1989, p. 126-127; Deyle and Smith 1998), and assist communities to resist or absorb and rapidly recover from disaster impacts (Beatley 2009; Peacock et al. 2009).

Although several studies evaluated state hazard mitigation efforts in the 1990s (e.g., Burby and May 1997; Deyle and Smith 1998; Godschalk, Brower, and Beatley 1989; Godschalk et al. 1999), research on the state-local relationship in hazards mitigation has not been conducted since the passage of the Disaster Mitigation Act of 2000 (DMA) (Smith 2011, p. 45; Smith and Wenger 2006, p. 242). As will be discussed, the DMA created a new intergovernmental policy framework for hazard mitigation that formalizes and strengthens states' role as a coordinator between local and federal mitigation efforts.

The overarching research question posed in this paper is—What activities have states undertaken to assist local governments to build the capacity needed to develop hazard mitigation plans and policies in light of the requirements of the Disaster Mitigation Act of 2000? Specifically, how do states vary in terms of the staff available to carry out state hazard mitigation goals; how do states vary in terms of funding, policies, and programs to carry out state hazard mitigation goals; how strong are states' local capacity and commitment building efforts to translate federal mitigation policy into local mitigation planning through the delivery of technical assistance; and to what degree are states encouraging local governments to integrate land use planning approaches into mitigation planning and how successful are these efforts?

This article begins by reviewing the literature on state capacity and commitment to support local mitigation efforts and develops a conceptual framework to guide the study. The key provisions of the DMA are then described. Next, the research design, data collection, and analysis methods are reviewed. Findings on state mitigation programs are then presented and compared to findings from previous studies. Finally, the article offers conclusions about key findings and a series of policy recommendations.

Conceptual Framework for Assessing State Mitigation Programs

State mitigation programs fill essential, multi-faceted roles in guiding and supporting local mitigation efforts to achieve national, state, and local risk reduction goals. Studies undertaken in the 1980s and 1990s before the passage of the DMA conceptualized the key capacity and commitment building dimensions of state mitigation programs (Burby and May 1997; Deyle and Smith 1998; Godschalk, Brower and Beatley 1989; Godschalk et al. 1999). These studies are used to identify the core conceptual dimensions in this study and more recent, post-DMA research are used to further specify the concepts.

For this study, we conceptualize six dimensions of state-level activities that are focused on building local governments' capacity and commitment to develop and implement hazard mitigation plans and policies. The first dimension, *state hazard mitigation staffing*, consists of the personnel that provide technical support, training, and assistance for local planning, as well as management and administration of mitigation programs (Godschalk et al. 1999). Second, *state mitigation program funding, policies, and programs* address whether a state employs a balanced, coordinated approach or a disjointed patchwork of support for local efforts (Burby and May 1997; May and Deyle 1998). Third, *state cost-sharing of hazard mitigation programs* assesses the degree to which state or local financial resources are used to cover non-federal financial grant requirements. Fourth, *state delivery of hazard mitigation technical assistance* evaluates the degree to which states help local governments build their own capacity (Brody, Highfield and Kang 2011; Burby and May 1997).

For the fifth and sixth dimensions, we conceptualize specific aspects of local mitigation efforts towards which state government agencies can target capacity and commitment building efforts. *State encouragement of local awareness of mitigation* is an important precondition that local governments have struggled to achieve (Mileti 1999; Godschalk, Brody, and Burby 2003). Sixth, *state encouragement of applying land use approaches to mitigate hazards* is widely recognized as a key to a proactive, sustainable mitigation strategy (Burby 1998; Godschalk et al. 1999; Mileti 1999; National Research Council 2006; Olshansky and Kartez 1998).

Overview of the Disaster Mitigation Act

Congress passed the DMA to spur states and local governments to develop better hazard mitigation plans that more effectively speed the expenditure of post-disaster mitigation funding and reduce rising disaster costs. The DMA requires states and local governments to develop hazard mitigation plans that comply with the standards established by the Federal Emergency Management Agency (FEMA) to remain eligible for certain types of federal hazard mitigation assistance before and after presidentially-declared disasters.

The DMA emphasizes grant administration, which dates back to the initial formulation of the Act. That emphasis was based, in part, on the idea that the development of state and local pre-disaster hazard mitigation plans would speed the implementation of post-disaster Hazard Mitigation Grant Program (HMGP) funds. At the time, FEMA was facing severe criticism from the Government Accountability Office and members of Congress due to large unspent balances in the HMGP following a number of federally-declared disasters and the slow speed at which funded projects were being implemented (Smith 2009a, p. 229).

A second principal aim of the DMA was to reduce escalating disaster losses through a more proactive and comprehensive approach to risk reduction. Following major disasters, expenditures from the federal disaster relief fund and emergency supplemental appropriations can exceed billions of dollars. According to the Office of Management and Budget, federal assistance averaged $11.5 billon per year between 2001 and 2010 (2011, p. 4). Growth in federal disaster declarations and their associated costs has led to funding more recent response operations while withholding hazard mitigation and disaster recovery funds from other federally declared disasters (Hodge, Fleisher, and Gershman 2011).

In addition to the emphasis on post-disaster hazard mitigation grants, the DMA resulted in the creation of the Pre-Disaster Mitigation program (PDM). Although the PDM represents a potentially important part of a federal emphasis on pre-event risk reduction (including the provision of funding to assist local governments develop hazard mitigation plans), it is a highly competitive grant program that tends to benefit those that have the resources required to develop viable applications (Association of State Floodplain Managers 2006, p. 3; Smith 2011, p. 65).[1] Furthermore, funding is small relative to national demand (Association of State Floodplain Managers, 2006, p. 2; McCarthy and Keegan 2009, p. 13).

Under the DMA, FEMA designates state hazard mitigation plans as enhanced or standard plans.[2] The distinction between standard and enhanced plans is largely based on a state's ability to show greater proficiency in grants administration, although states are also requested to "demonstrate a broad, programmatic mitigation approach" (FEMA 2008, p. v), an ill-defined criterion (Government Accountability Office 2007; Smith 2008a, p. 229).[3] Enhanced plans, which enable states to receive additional post-disaster hazard mitigation funds, represent an effort by FEMA to encourage the development of higher quality plans. Recent research on the quality of state hazard mitigation plans indicates that enhanced plans (e.g., Georgia, Pennsylvania, and Virginia) did not exhibit high quality across multiple planning elements (Berke, Smith, and Lyles 2012).

The issues surrounding the standard/enhanced classification system, increased spending on disaster relief, and the competitiveness of the PDM represent the latest evidence of long-standing problems in U.S. hazard mitigation policy. The nation struggles to provide an appropriate balance between post-disaster assistance and building

a partnership that includes federal, state, and local government stakeholders focused on reducing hazard vulnerability through pre-event hazard mitigation planning and policy making.

Research Design and Methods

To assess the state role in mitigation, we used multiple sources of evidence, including mail surveys, telephone interviews with State Hazard Mitigation Officers (SHMOs),[4] reviewed archived documents, and used previously conducted plan quality analyses. This allowed the study team to compare and analyze the results.

Sample Selection Criteria

The coastal state hazard mitigation program is the unit of analysis for this study. Coastal states were used because their local communities tend to experience high growth pressures and high vulnerability to hazards (Brower, Beatley, and Schwab 2002; NOAA 2004). Six coastal states were included in the sample using criteria developed to ensure variation across the conceptual dimensions of capacity and commitment and enable comparisons of our findings with studies of pre-DMA state mitigation programs.

The two criteria used, based on an analysis of 30 coastal state plans, were the strength of a state's planning policy context, and the quality of the state's hazard mitigation plan. Using Institute for Business and Home Safety/American Planning Association survey data, we defined state planning contexts as "strong" if the state had a comprehensive planning mandate that included a required hazards element, "moderate" if the state had a comprehensive planning mandate but no hazards element, and "weak" if there was no planning mandate (Schwab 2009). State plan quality was defined as "strong" if the plan score was in the top 20% of the 30 plans reviewed, "moderate" if it was in the middle 60% and "weak" if it was in the bottom 20% (Berke, Smith, and Lyles 2012). The six states selected varied across the two criteria and included two Pacific coast states, two Gulf Coast states, and two Atlantic coast states. Florida and North Carolina were strong on both criteria, California had strong plan quality and moderate planning context, Washington was moderate on both criteria, Texas had moderate plan quality and weak planning context, and Georgia was weak on both dimensions.

Data Collection

Mail surveys were administered to the SHMOs in each of the six states in late 2010 and 2011. The surveys included quantitative, qualitative, and open-ended questions addressing mitigation-relevant state legislation and programs, state staffing, funding support for local mitigation, and state technical assistance. Upon receiving and reviewing

the mail survey results, we conducted semi-structured phone interviews with the SHMOs and, in some cases their staff. Interviewees received the questions in advance, which focused on stakeholders engaged in mitigation, capacity to conduct state mitigation planning and to support local mitigation, linkage of mitigation with land use planning, and factors driving mitigation successes and setbacks. In addition, we reviewed multiple documents including mitigation studies, written policies and program guidance, and memoranda. Copies of the survey and interview protocols are available at http://www.ie.unc.edu/cscd/projects/dma.cfm

Data Analysis

Following Yin (2009), we synthesized the data in the state case studies to enable cross-state comparisons. We focus on commonalities and divergences across the six states to identify patterns across the states. We tabulated the mail survey results, extracted themes and quotes from interview transcripts, and pulled relevant information about state capacity and commitment from mitigation plans and other documents.

Results

The results are framed according to six dimensions—state hazard mitigation staffing; state hazard mitigation funding, policies, and programs; state cost-sharing of federal hazard mitigation programs; state delivery of hazard mitigation planning technical assistance; state encouragement of increased local awareness and commitment to hazard mitigation; and state encouragement of local land use planning.

State Hazard Mitigation Staffing

Staffing figures varied widely across the six states with Florida maintaining a staff that is more than twice as large as California's (Table 1). Florida bolsters their existing staff with a summer intern program that draws master's students from Florida State University's Department of Urban and Regional Planning. Georgia, North Carolina, and Texas maintain similarly sized staffs, whereas Washington possesses the smallest staff. These numbers are substantially higher than the staffing levels found by Godschalk, et al. (1999, p. 472), who noted that—in the 39 states assessed—over three quarters of states had fewer than five hazard mitigation staff and approximately one half of states had one staff person or no one tasked with hazard mitigation activities.

Assessing the total size of hazard mitigation staff (measured as those working in state emergency management agencies dedicated to hazard mitigation activities) does not fully characterize important fluctuations in the size of a state's hazard mitigation workforce and changes to the makeup and experience of personnel over time. Contextual and

temporal issues affecting staff size include the presence, in states such as California, of a robust, multi-dimensional set of hazard mitigation policies administered by other state agencies. Since this study only assessed the number of state emergency management agency officials dedicated to hazard mitigation activities, recorded hazard mitigation staffing levels probably underestimated overall capacity. The degree to which state emergency management staff coordinated with other state officials to achieve broader hazard mitigation aims will be discussed later in this paper.

Table 1. State Hazard Mitigation Staffing Patterns

States	California*	Florida*	Georgia*	North Carolina	Texas	Washington*
Agency						
Management/ Administration	11	5	4	4	8	1
Technical	2	3	0	1	0	0
Field Support/Training	0	15	0	0	0	2.5
Planning	6	4	1	4	2	1.5
Other	0	3	3	3	0	0
Field Staff						
Management/ Administration	0	2	0	0	3	0
Technical	0	7	0	0	0	0
Field Support/ Training	0	9	2	0	0	0
Other	0	0	1	0	0	0
Total	19	48	11	12	13	5

* Enhanced state hazard mitigation plan status (as defined by FEMA) requires meeting higher standards of practice than a standard plan (no asterisk).

Georgia does not face the same degree of hazard vulnerability, extent of land area, or number of local governments as Texas, Florida, or California. Although Georgia reported that the ability to provide good pay and benefits has led to the development of a stable and experienced mitigation planning staff, the number of employees administering hazard mitigation grants who leave for other job opportunities remains high. Florida noted high staff turnover across the board, citing low pay for state government personnel, even though the state maintains 15 agency staff working directly with local governments—which represents a significant commitment to local capacity building. Each state also supports a staff dedicated to hazard mitigation planning, with California possessing the largest number of positions focused on this task.

The fluctuation in size and experience levels of state hazard mitigation staffs was cited by SHMOs as a major problem (see also Burby 1995; Burby and Patterson 1993). Following Hurricane Floyd in 1999, the North Carolina hired and maintained a staff of 50

hazard mitigation planners, grants managers, and risk assessment personnel for several years. Most of these positions were time-limited because they were paid by federal funds associated with the administration of post-disaster hazard mitigation grants.[5]

The ability to hire and maintain adequate staff that can capture and transfer institutional knowledge gained over time remains an ongoing challenge. One SHMO noted that they had recently filled all of their positions for the first time in six years. Texas, like other states, has relied heavily on post-disaster administrative funds to carry out a number of hazard mitigation initiatives. Of the 13 hazard-mitigation positions in Texas, all but two (the SHMO and one Hazard Mitigation Planner) are paid from post-disaster administrative funding.

State Hazard Mitigation Funding, Policies, and Programs

States exhibit a diverse set of funding, policies, and programs aimed at building the capacity needed to address hazard mitigation-related issues. In California, for instance, the Department of Water Resources California Levee Bond Funds total $500 million dollars and are used to rehabilitate state and federal levees that protect local communities and infrastructure. California also passed state law AB 2140, which provides an incentive to incorporate hazard mitigation into the safety element of local comprehensive plans through the provision of additional state funds following a federally declared disaster.

State officials in Florida noted their emphasis on building and sustaining partnerships with the insurance industry, the state homebuilders association, water management districts, the Florida League of Cities, and the Florida Association of Counties, among others. These partnerships have led to a number of important state programs, including, for instance, the Residential Construction Mitigation Program, which sets aside $10 million per year. Of this amount, $7 million is allocated for wind hazard retrofit projects, a mitigation outreach and education initiative, and building code-related efforts. Three million dollars is also allocated to retrofit state evacuation shelters. The Residential Construction Mitigation Program is funded through the Florida Hurricane Catastrophe Fund.

North Carolina emphasizes pre- and post-disaster state hazard mitigation programs, both of which were initially triggered by special legislative appropriations following Hurricane Floyd, the worst disaster in the state's history.[6] The programs include the provision of a state match for HMGP, the creation of the State Acquisition and Relocation Fund (SARF), and $30 million to create the North Carolina Floodplain Mapping Program (NCFMP). The SARF provides up to $75,000 in state money to low-income residents participating in the relocation of flood-prone housing under the HMGP because the federal program can only provide pre-disaster fair market value for the structure. The provision of additional state funds is intended to serve as an incentive for low-income residents to move out of the floodplain and into safer housing. Under the

North Carolina Floodplain Mapping Program, the state has assumed the traditional federal responsibility for the re-mapping and updating Flood Insurance Rate Maps. The state match and SARF are now codified in state law, and are part of a tiered disaster declaration process in North Carolina, whereas the NCFMP receives a mix of state and federal dollars to maintain the program.

As part of the state's tiered disaster declaration system, NC Senate Bill 300 requires the adoption of a local hazard mitigation plan in order for communities to remain eligible to receive state assistance following smaller events that do not meet federal disaster declaration criteria. North Carolina's decision to link the presence of a hazard mitigation plan to grant eligibility predates a similar federal requirement later promulgated under the DMA.

The state of Washington administers three programs, including the Disaster Response Account, the Flood Control Assistance Account, and Flood Damage Prevention Grants. The Disaster Response Account, administered through the Military Department (the State Emergency Management Division's administrative location), amounts to $7 million. The purpose of the program, which is supported by state general funds, is to provide the state match for HMGP and Public Assistance for federally-declared disasters.[7] The Flood Control Assistance Account Program, which is administered through the Department of Ecology, was $2 million for 2009-2011. No funds were appropriated for 2011-2013.

Historically, the program provided $4 million per biennium to local governments. The purpose of the program is to pay for comprehensive flood management planning and flood damage reduction projects. The Flood Damage Prevention Grants, also administered through the Department of Ecology, represent a one-time appropriation through the state capital budget of $1.35 million during years 2009-2011. The program funded local projects designed to prevent flood damage.

The General Land Office, which is responsible for managing 20.4 million acres of land and mineral rights in Texas, administers the Coastal Erosion Planning and Response Act (CEPRA) program. The goals of CERPA include protecting public infrastructure, valuable habitat, public and private property, and natural resources; mitigating storm damage; and partnering with local, state, and federal agencies to increase funding opportunities and resources. This program targets "critical coastal erosion areas" which are defined as coastal regions that have experienced historical erosion at a rate greater than two feet per year. Funding for CERPA is provided by the state but requires a local match for most projects, the amount of which varies based on the type of project.

State Cost-Sharing of Federal Hazard Mitigation Grant Programs

Another way to assess the commitment of each state to local hazard mitigation efforts is to review the amount of the non-federal match that is assumed by the state versus local governments for pre- and post-disaster hazard mitigation grant programs (Table 2). A

state's willingness to shoulder some or all of the non-federal match requirements influences the actions of local governments in two important, but sometimes contradictory, ways. For instance, as states assume more of the non-federal cost share, this can help low-income communities with high levels of socially vulnerable populations to participate in hazard mitigation grant programs that they may not be able to afford otherwise. However, cost sharing arrangements can also create a disincentive for local communities and individuals to adopt proactive hazard mitigation measures funded by local revenues or personal savings (May and Deyle 1998; Sylves 2008, p. 96).

Table 2. Grant Matching Characteristics by State

Match Payer	California*	Florida*	Georgia*	North Carolina	Texas	Washington*
State Government	0%	0%	10% for declared Counties	100% of match for HMGP; 0% for others	0%	Depends
Local Government	25%	Varies by Community	25%	25% or more	18.75% for homeowner-based projects, or 25% for other projects	Depends
Individual Property Owner	0%	Varies by Community		25% or more	6.25% for relocation projects	Depends

* Enhanced state hazard mitigation plan status (as defined by FEMA) requires meeting higher standards of practice than a standard plan (no asterisk).

In California, local government is expected to assume the non-federal match requirement, whereas in North Carolina the state picks up the non-federal match for the HMGP but not other mitigation programs. Florida requires local governments and individual property owners to assume a percent share of the non-federal match on a case-by-case basis, whereas Georgia pays 10 percent of the match for HMGP projects in any counties that has been declared a federal disaster area. Texas does not provide the non-federal share, relying instead on local governments to pick up the match for the retrofit of critical facilities and the homeowner to cover the non-federal share of housing related projects. In Washington, non-federal match procedures differ depending on the nature of the sub-grantee and the source of mitigation funding. For instance, if a state agency receives HMGP funding, the entire non-federal match is paid out of a state disaster response account, whereas when local communities receive HMGP funds, the county or municipality may pay all or half of the match depending on the nature of the project. In the case of hazard mitigation projects involving homeowners, some jurisdictions require

the homeowner to pay for half or all the non-federal match. For all other mitigation grants in Washington, local governments pay the non-federal share.

State Delivery of Hazard Mitigation Planning Technical Assistance

States provide planning support in a number of ways (Table 3). For instance, all states but Texas reported that they created manuals and guidebooks as a way to help inform local communities about hazard mitigation planning. All states host workshops and conferences to provide information and to conduct training of local officials, review local plans before their submittal to FEMA for approval, and furnish data for use in local plans. California, which noted that they did not provide direct planning assistance when questioned in the SHMO survey, later responded that they did offer assistance through the use of phone calls, email, and a web portal. California's decision to provide this type of help may be due to the strong pre-existing planning culture in the state. However, when questioned about this, the SHMO noted that this approach reflects the size of the state, which has 58 counties, 500 cities, and over 5,000 special districts, each of which could develop a local hazard mitigation plan. At the time of the survey, the state had 700 approved local hazard mitigation plans.

Other techniques, such as the identification of best practices and hazards analysis training, are provided by the states of California and Florida, with Washington offering help with the latter. Georgia developed the Georgia Mitigation Information System (GMIS), a GIS-based tool that allows local governments to map and assess the vulnerability of critical facilities. The California Emergency Management Agency, working with California Natural Resource Agency and California Polytechnic University's Planning Department faculty, has developed *My Plan* and *My Hazards*. *My Plan* is a centralized, GIS-based catalogue of hazards data for use in the development and update of local plans and *My Hazards* is an easy to use website that allows users to plug in a street address, zip code or other pertinent identifiers and get basic information on the hazards found in that area and potential mitigation measures that an individual, family or business owner might consider.

Texas does not provide direct planning assistance to individual communities, but instead relies on group training sessions because the state comprises 254 counties. Texas works closely with a number of universities that assist with state-wide risk assessments, including the University of Texas (earthquake hazard analysis), Texas A&M University (hurricane) and Texas Tech University (tornado). Funds are provided to the universities to conduct analyses and host the information on a website so communities have ready access to the data. North Carolina has worked closely with faculty at the University of North Carolina at Chapel Hill's Department of City and Regional Planning since 1996. Guidebooks have been prepared for use in training and informing local officials about the

Table 3. State Delivery of Hazard Mitigation Technical Assistance

States	California*	Florida*	Georgia*	North Carolina	Texas	Washington*
Manuals, Guidebooks	Yes	Yes	Yes	Yes	No	Yes
Case Studies With Best Practices	Yes	Yes	No	No	Yes	No
Workshops or Conferences	Yes	Yes	Yes	Yes	Yes	Yes
Hazard Analysis Training	Yes	Yes	No	No	Yes	Yes
Data for Use in Local Plans	Yes	Yes	Yes	Yes	Yes	Yes
Planning Process Training	Yes	Yes	Yes	Yes	Yes	Yes
Direct Planning Process Assistance	Yes	Yes	Yes	Yes	No	Yes
State Mitigation Staff on Local Mitigation Committees	No	No	No	No	No	No
Pre-Review of Local Plans	Yes	Yes	Yes	Yes	Yes	Yes
Connect Locals With Consultants or Regional Agencies	No	No – not consultants; Yes – other communities or regional planning commissions	No	No	No	No – not consultants; Yes – connect locals with each other
Other	Yes- via phone, email, and web portal	No	No	Yes - regional workshops outreach for soliciting projects		No

* Enhanced state hazard mitigation plan status (as defined by FEMA) requires meeting higher standards of practice than a standard plan (no asterisk).

planning process, including the application of land use planning tools and techniques to reduce future losses.

Two types of state support were less prevalent or nonexistent, including serving on local planning committees and connecting local government officials with consultants or regional planning agencies. SHMOs cited the time consuming nature of this task and the potential appearance of favoritism as principal reasons for not serving on local committees. Although most state agencies are precluded from recommending private sector contractors, SHMOs said that they did inform local officials about the potential use of regional planning organizations to help them develop and implement hazard mitigation plans. This response coincides with other research findings that describe regional planning organizations as key stakeholders involved in the writing of local and regional hazard mitigation plans and the administration of hazard mitigation and disaster recovery grant programs (Deyle 1995; May and Deyle 1998, p. 75-78; Smith 2011, 112, p. 83-85).

State Encouragement of Local Awareness and Commitment to Hazard Mitigation

Increasing awareness of hazard risk at the community level remains one of hazard mitigation planning's greatest challenges (Mileti 1999). Even though most states in our study utilize workshops and conferences and, to a lesser extent, the development of case studies that highlight best practices, several SHMOs mentioned a lack of general awareness of hazard mitigation at the community level. One SHMO described the issue of awareness in the following manner "We don't want to walk into a room of people, no matter who they are, and say "How many of you know what mitigation is? And only have a few hands go up. We want all of the hands to go up." Another SHMO noted that "I talked to an Emergency Management Coordinator who had been on the job for eighteen months and he didn't know that there was a hazard mitigation plan in place in his county until he found it in a box and he had to go find out what the plan was and what it was for."

Citing what he called an all too common occurrence associated with high job turnover at the local level, an interview respondent lamented "Assistant Fire Chief Bill calls me up and says, I'm supposed to do something called a hazard mitigation plan. What is it?" After responding that it expires in a month, the chief's response is "Well, how do I get me one of those plans? We can't hire a new person so we're not doing a plan unless you got a cookie cutter thing [plan]." The SHMO further stated that some local officials do not take the planning process seriously until a disaster strikes, realizing that a plan is required to access post-disaster mitigation funds. "You think it [developing a plan] was hard before the flood hit? How hard is it going to be after you're the responder, the recovery person, and the mitigation planner and you were too busy before? How busy are you now? So it's harder to plan now isn't it?"

SHMOs also expressed great frustration with many local governments for failing to embrace a greater commitment to the implementation of hazard mitigation measures,

including the reluctance of communities to use the results of the risk assessment found in their plans to drive the selection of hazard mitigation projects and policies. The comments of the SHMOs are comparable to findings uncovered by a meta-analysis of plan quality evaluations, including those that addressed hazard mitigation, in which the vulnerability science and locally derived mitigation actions were weak (Berke and Godschalk 2009; Berke and Smith 2009, p. 7).

Following Hurricane Ike, which struck Texas in 2008, the state received $406 million in HMGP funds. During the same event, a Congressional appropriation targeting hazard mitigation activities totaled over $3.3 billion. Yet when queried about the quality of pre-Ike hazard mitigation plans in Texas, the SHMO noted that their quality was poor and did not serve as a useful tool to pre-identify eligible projects funded by these two programs.

According to SHMOs, a number of factors have hindered the ability of states to increase awareness and commitment to hazard mitigation at the local level, including an overreliance on consultants, a lack of hazard mitigation awareness among citizens and elected officials, and the inability to identify a local advocate for hazard mitigation. Several SHMOs noted that the widespread use of consultants has hindered the planning process, often leading to a lower level of local investment in the development of a plan. Relying on a third party to do the plan has the potential to further distance local officials from the process, including the time required to garner public involvement and gain a deeper understanding of hazard vulnerability. Consultants can perpetuate mediocrity as they seek to do the minimum required to meet FEMA standards while still "breaking even" or garnering a profit from what often amount to low-cost planning grants. As one SHMO explained, "A contractor-driven plan [represents] the shortest distance between two points, achieving the minimum standards required by FEMA while ensuring they get paid. The result is a plan that has limited public involvement or clear connections between the risk assessment and the identification of local projects."

In Texas, 35% of the HMGP selection criteria are based on whether the project applied for can be found in the applicant's hazard mitigation plan. Even though this requirement is widely advertised during state HMGP and local hazard mitigation planning training sessions, only 5% of applicants comply with this policy. Local flood control districts in Texas have consistently adhered to this state policy and as a result HMGP projects are disproportionately awarded to this group. SHMOs also described cases in which consultants, local emergency managers, or others tasked with the development of plans are told by elected officials not to identify specific hazard mitigation projects or propose new policies as this might require a community to take action or be held liable for failing to do so before a disaster.

In an effort to increase awareness and commitment to hazard mitigation, California created the Statewide Mitigation Assessment Review Team (SMART). SMART comprises a group of state university faculty that conduct post-disaster assessments of completed hazard mitigation projects to document the losses that were avoided due to the

implementation of the projects before the event in question. According to the California SHMO, the results of SMART serve as an important tool to help publicize the value of hazard mitigation to those that may be skeptical of participating in such planning efforts.

North Carolina also developed a process to document losses avoided after two major hurricanes struck the eastern third of the state in the mid- and late-1990s, causing major flooding and the large-scale relocation of flood-prone housing. Two "success story" documents were created, one that qualitatively outlined the hazard mitigation programs and policies in place following the first disaster, and a second document that quantified the monetary savings achieved in those locations that were flooded for a second time where houses had since been elevated or relocated (State of North Carolina 1999, 2000). The two documents were intended to stimulate a dialogue among state and local government officials about the role of hazard mitigation framed within a larger conversation about sustainable development and convey the importance of integrating hazard mitigation into their day-to-day activities (1999, p. 5).

When asked about what made states and local governments successful, SHMOs routinely cited the presence of an advocate that not only understood the technical nature of hazard mitigation planning and its connectivity to grants management and land use, but perhaps more importantly, how to build and maintain diverse coalitions. According to SHMOs, successful plans and the hazard mitigation strategies they contain tended to be the result of a long-term commitment to generating interest, garnering political support, identifying differing technical experts, delivering sound guidance, conducting training programs, and providing data that support local efforts.

State Encouragement of Local Land Use Planning

When asked about the connectivity between hazard mitigation and land use planning, SHMOs reported that they encouraged local governments to address the issue; indeed many states require some type of policy integration through hazards mapping and other agency policies (e.g., growth management, comprehensive land use planning, local safety element). Yet when pressed, all SHMOs noted that land use was not adequately addressed in local hazard mitigation plans, even in those states with strong "planning contexts" (e.g., Florida and North Carolina) or those states that maintain efforts to encourage multi-objective planning through training and outreach programs.

According to SHMOs, most local governments sought to meet the minimum hazard mitigation planning criteria established by FEMA, which does not contain explicit land use requirements. The comments provided by SHMOs support research that has found that local hazard mitigation plans do not effectively confront land use issues (Burby and May 1997; Deyle Chapin and Baker 2008; National Research Council 2006; Olshansky and Kartez 1998). These findings have remained true over time, even as the quality of

local hazard plans has improved following the passage of the DMA (National Research Council 2006; Berke and Smith 2009).

One SHMO noted that, although the state's Growth Management Act requires the identification and mapping of flood and geological hazard areas, the development of regulations intended to limit growth in these locales is a politically charged decision that leads to a great deal of variability in the extent to which state regulations translate to action at the community level. Further, the SHMO noted that the degree to which this information is integrated into local hazard mitigation plans also varies. In part, this is due to the limited interaction between local land use planners involved in the implementation of the Growth Management Act and local emergency managers who typically lead hazard mitigation planning activities in their respective counties and communities. The lack of coordination between local emergency managers and land use planners was documented before the passage of the Disaster Mitigation Act (Kartez and Faupel 1994) and it remains a serious problem (Smith 2009b, p. 262-263). More recent research has argued that land use planners need to become more committed to hazard mitigation if land use measures are to be used for this purpose (Stevens 2010).

In a disconcerting statement about the quality of hazard mitigation planning and the DMA more generally, one SHMO stated that, given the current condition of local plans (i.e., the poor connectivity between plans and mitigation projects and the limited application of land use), he wouldn't be surprised if the program were discontinued given the large expenditures on planning and the poor results that have resulted. Although this comment reflects a highly pessimistic outlook regarding the future of the DMA and its associated policies, the broader findings of our research team have found that many indicators of plan quality and states' efforts to build local capacity and commitment to hazard mitigation planning are improving, albeit slowly, given the span of time that the DMA has been in place. The degree to which national hazard mitigation policy continues to evolve, including the development of strategies aimed at the more effective integration of land use planning and risk reduction represents one of several areas in need of significant improvement.

Conclusions

This article has described the role that states play in building local capacity to develop and implement local hazard mitigation plans and policies. The findings suggest that states have made some progress since the last state-level analysis of hazard mitigation planning and capacity-building initiatives was conducted in 1999. However, more than 10 years after the passage of the DMA, several important issues continue to affect the ability of states to assist local governments in building robust hazard mitigation plans and integrated risk reduction policies.

The study findings indicate that states maintain a wide variation in state capacity and commitment to support local hazard mitigation activities, including that which is influenced by disaster-based funding. States also tend to emphasize building local governments' capacities to gain access to project funding rather than focusing on helping them identify and establish a comprehensive, proactive, and sustained risk reduction strategy grounded in land use policy. In addition, state land use policies are not well integrated into state hazard mitigation plans and capacity building initiatives. Finally, state mitigation officials believe that most local governments do not possess the capacity or commitment necessary to develop sound hazard mitigation plans or administer hazard mitigation grants. These findings, which have important policy implications and merit attention from FEMA as well as state agencies tasked with hazard mitigation policy and local capacity building initiatives, are discussed next.

The indicators of state capability, including staffing dedicated to grants management, planning, and outreach; funding of state programs and non-federal match requirements; and state-level policies and programs vary significantly among the states queried in this study. The high degree of variation is due to a number of factors, including fluctuations associated with the federal funding of staff positions following a major disaster; a state's past history of disasters; and a state's commitment to hazard mitigation as evidenced by their willingness to pay for non-federal match requirements, create permanent positions, and maintain state mitigation programs over time.

The ability of states to translate federal hazard mitigation policy into local planning efforts is closely associated with the indicators of state capability described in the previous paragraph. These measures are supplemented by the more specific delivery of planning support, including the widespread use of planning manuals, the hosting of workshops and other training venues, and the provision of data. The ability of these measures and processes to build local capacity appears somewhat limited, as low levels of local capacity and commitment were regularly cited as a major problem, regardless of the state-level capacity-building efforts in place. When pressed during individual phone interviews, SHMOs also noted the magnitude of the task before them and cited the need for more staff to engage in expanded education and outreach efforts.

SHMOs also noted that disjointed federal hazard mitigation policies, including state and local planning standards established by FEMA, strongly influence states' actions. As a result, SHMOs tend to focus their technical assistance efforts on assisting local governments develop plans that enable access to hazard mitigation funds. Less emphasis is placed on a more systematic attempt to incorporate land use tools and techniques into local hazard mitigation plans. The SHMOs' descriptions of local governments' emphasis on the identification of hazard mitigation projects versus the application of land use planning measures is similarly reflected in the research literature. Factors affecting the reluctance of local governments to adopt preventative measures include challenges

associated with property rights, environmental management, and economic development pressures (National Research Council 2006).

The SHMOs interviewed in this study all said that they encourage local governments to incorporate land use planning techniques into their hazard mitigation plans. This information is conveyed in training programs and found in manuals developed by states. SHMOs also noted that very few local hazard mitigation plans effectively linked land use and hazard risk reduction, even in those states that maintain strong land use laws or require the incorporation of hazard elements into local comprehensive plans. SHMOs cited a number of reasons for this outcome, including local officials striving to meet minimal federal standards (that do not require a land use component); local plans being predominantly led by emergency managers rather than land use planners; and state emergency management officials responsible for the development of State Hazard Mitigation Plans having failed to develop integrated policies in partnership with other agency officials who administer state programs that include land use provisions and requirements.

Recommendations

A common thread binding the recommendations that follow is the need to enhance states' capacity to better fulfill their critical role as the lynchpin in the larger national hazard mitigation planning and policy milieu.

Improve States' Ability to Carry Out State Mitigation Goals

The variation in capabilities across states and over time has important policy implications that should be recognized and addressed through improved state and national hazard mitigation policy. Specific changes should focus on the sustained provision of pre-event resources to states to better carry out state hazard mitigation goals tied to improved capacity building delivery mechanisms and inter-agency coordination. This recommendation represents an important counterpoint to the current set of federal policies that have led to an overreliance on post-disaster assistance, including hazard mitigation (Smith 2011).

The rise and fall of state capabilities, as evidenced by changing staff levels, does not allow for a consistent approach that emphasizes the importance of pre-event hazard mitigation planning, policy making, and local capacity building initiatives. Rather, the post-disaster influx of funds and associated positions encourages the adoption of reactive state tactics, driven in large part by the desire to obtain and process post-disaster hazard mitigation funds that are largely used to address mistakes made in the past, not necessarily adopt a forward looking, anticipatory, and long-term strategy that embraces land use as a central element (Berke and Smith 2009; Smith 2009a).

Although the DMA has placed greater requirements on state officials, the availability of federal funds to hire additional permanent staff has not kept pace, remaining essentially the same since the creation of the federally funded SHMO position following the passage of the Robert T. Stafford Act in 1988. To address identified shortfalls in state capacity, this should change. Although the number of state hazard mitigation staff have increased significantly since the Godschalk et al. (1999) study of hazard mitigation, much of this growth is found in states that have experienced repeated large-scale events that trigger post-disaster administrative funds used to hire staff on a temporary basis. States have also begun to fund permanent positions and this approach should be commended and pursued when possible. Federal assistance or funds derived from other relevant stakeholders, such as the insurance industry, should be used to leverage these state-led efforts.

States have developed a range of hazard mitigation policies and programs, including those that provide local governments with needed data and training, target gaps in federal hazard mitigation assistance, and address land use. To improve their efficacy, avoid duplication, and leverage available resources, these policies should be better integrated into State Hazard Mitigation Plans. Through better state agency coordination across those agencies that manage hazard mitigation-related programs, the more effective delivery of training, education, and other forms of local capacity building should follow. This is particularly true in those cases where state agencies maintain land use planners and oversee programs that contain land use requirements.

Increase the Emphasis States Place on Encouraging the Application of Land Use Policies, Tools, and Techniques in Local Hazard Mitigation Plans

In the face of the contextual conditions described up to this point, both local and state government officials should better utilize available resources to advance a land use planning agenda that embraces hazard mitigation. Examples include the more active involvement of local land use planners in the hazard mitigation planning process and the more effective participation of state agencies tasked with land use policies and programs.

Many local officials continue to believe that hazard mitigation planning is an emergency manager's responsibility, whereas land use planners may not recognize the important role they have to play in this process (Smith 2009b, p. 262-263). Addressing these faulty assumptions requires actively soliciting the participation of land use planners; educating local elected officials about how a good hazard mitigation plan draws on the expertise of land use planners, emergency management officials, and others in a larger hazard mitigation network; and using widely accepted land use tools and techniques (e.g., site design, codes and standards, public investments, land suitability analyses, zoning, subdivision ordinances, etc.) to better address current and projected hazard vulnerabilities. Emphasizing a more balanced approach takes advantage of the fact

that local emergency managers often have a good understanding of areas prone to hazards (based on past experience), and tend to have a direct working relationship with state emergency management agencies (where SHMOs are located and hazard mitigation funds are administered). By contrast, land use planners are trained in plan making and the application of land use planning techniques to address community goals.

A similar lack of coordination was found to exist at the state level. This condition should be rectified by improving the partnership between state emergency management agencies and those who manage state programs that contain a land use policy element. Tangible actions should include the development of more integrated state policy frameworks and the development of joint training programs conducted by SHMOs and other state agency officials.

Foster State-Level Advocacy Tied to Embracing the Original Intent of the Disaster Mitigation Act of 2000.

State agencies responsible for hazard mitigation activities should take a more active role in advocating for changes in the DMA, as the current rules do not place a sufficient emphasis on policies and capacity building initiatives that empower responsible parties to achieve the original intent of the Act. For instance, current federal mitigation policy neither provides the pre-event resources needed to strengthen state and local capacity nor instills a sincere and sustained commitment to hazard mitigation beyond the minimal standards that have become an all too common criterion of mediocrity. As currently interpreted and administered, the DMA's enabling rules continue to foster state and local dependence on post-disaster grant programs rather than building increased levels of self-reliance achieved, in part, through good hazard mitigation practices grounded in proven land use planning techniques.

Advocating higher standards should be linked to the reallocation of federal, state, and local resources that are required to build and sustain the capacity of local governments and the larger network of relevant stakeholders needed to meet this higher policy threshold. However, any attempt to increase standards without building greater federal, state, and local capacity and commitment to these proposed changes in policy will result in the overall weakening of a program that still has unrealized potential, even though it was created more than ten years ago. The ability to change the current trend of escalating disaster losses in the US requires that local governments take greater ownership of its responsibility to reduce hazard risks through land use planning, states recommit their efforts to deliver the capacity building resources needed to accomplish this aim, and the federal government establish a set of coordinated policies that facilitate this process.

Notes

1. As this article was nearing submission, the funds normally allocated to the Pre-Disaster Mitigation Program were assimilated into the National Preparedness Grant Program (NPGP), which is an amalgamation of several emergency management grants. While the intent of this effort is to streamline most FEMA-sponsored grants, many have expressed concern that the PDM program as it currently exists is slated for elimination and that future hazard mitigation grant applications sought through the NPGP may be harder to obtain, as they would now compete with other disaster response-oriented applications (American Planning Association 2012; National Hazard Mitigation Association 2012).
2. An enhanced plan enables states to receive more HMGP funds than those states that maintain a standard hazard mitigation plan. In most cases, the amount of HMGP funds received by a state that maintains a standard mitigation plan are based on 15 percent of total federal disaster costs whereas states that possess an enhanced plan receive an allocation of HMGP funds equal to 20 percent of total federal disaster costs.
3. In 2013, FEMA created the National Hazard Mitigation Framework. The degree to which the framework addresses the issues noted in this paper, other research, and the input of state and local officials merits close attention.
4. Each state maintains a federally-funded SHMO position that is responsible for the oversight and administration of state hazard mitigation planning and grants management activities as well as providing technical assistance to local governments.
5. Following federally-declared disasters, states are provided, as part of HMGP administrative costs, funding to manage the grant program. These funds may be used to hire staff and contractors, conduct training, rent office space, travel to relevant events such as conferences and workshops, purchase equipment, or conduct other activities pursuant to an administrative plan that is agreed to by FEMA.
6. In another study conducted by our research team, we found that that North Carolina's incentive-based approach resulted in higher quality local hazard mitigation plans when compared to Florida's more regulatory approach (Berke, Lyles and Smith 2011).
7. FEMA's Public Assistance (PA) program funds a number of post-disaster response and recovery efforts including state and local personnel costs associated with managing response and recovery programs, debris removal, and the repair of damaged infrastructure. The post-disaster application of the PA "406" program, which can be used to incorporate hazard mitigation measures into the repair or reconstruction of damaged infrastructure, varies significantly across states.

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References

American Planning Association. 2012. *FY 2013 Federal Budget Summary and Analysis.* http://www.planning.org/features/2012/federalbudget.htm.

Association of State Floodplain Managers. 2006. *Improving the Pre-Disaster Mitigation Program. Position Paper.* Madison WI: Association of State Floodplain Managers.

Beatley, Timothy. 1998. "The Vision of Sustainable Communities." Pp. 233-262 in *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*, edited by Raymond Burby. Washington DC: John Henry Press.

Beatley, Timothy, David Brower and Anna Schwab. 2002. *An Introduction to Coastal Management.* Washington DC: Island Press.

Beatley, Timothy. 2009. *Planning for Coastal Resilience: Best Practices for Calamitous Times.* Washington DC: Island Press.

Berke, Philip. 1995. "Natural Hazard Reduction and Sustainable Development: A Global Assessment." *Journal of Planning Literature* 9(4): 370-382.

Berke, Philip, N. Ericksen and J. Dixon. 1997. "Coercive and Cooperative Intergovernmental Mandates: A Comparative Analysis of Florida and New Zealand Environmental Plans." *Environmental and Planning B: Planning and Design* 24: 451-468.

Berke, Philip and David R. Godschalk. 2009. "Searching for the Good Plan: a Meta-Analysis of Plan Quality Studies." *Journal of Planning Literature* 23(3): 227-240.

Berke, Philip and Gavin Smith. 2009. "Hazard Mitigation, Planning and Disaster Resiliency: Challenges and Strategic Choices for the 21st Century." Pp. 1-20 in *Building Safer Communities: Risk, Governance, Spatial Planning and Responses to Natural Hazards*, edited by Urbano Fra Paleo. NATO Science for Peace and Security Series, E, Human and Societal Dynamics, Volume 58. Amsterdam: ISO Press.

Berke, Philip, Gavin Smith, and Ward Lyles. 2009. *State Hazard Mitigation Plan Evaluation. Annual Report.* Chapel Hill NC: Department of Homeland Security, Center of Excellence. Disasters, Coastal Infrastructure and Emergency Management.

Berke, Philip, Gavin Smith, Ward Lyles. 2012. "Planning for Resiliency: An Evaluation of Coastal State Hazard Mitigation Plans." *Natural Hazards Review* 13(2): 139-149.

Berke, Philip, David Salvesen, Ward Lyles and Gavin Smith. August 2011. *Community Rating System: Integrating Results of Interviews, Websurvey and Plan Content Analysis*. Chapel Hill NC: University of North Carolina, Institute for the Environment.

Birkland, Thomas. 2006. *Lessons of Disaster: Policy Change After Catastrophic Events*. Washington DC: Georgetown University Press.

Brody, Samuel. 2003. "Are We Learning to Make Better Plans? A Longitudinal Analysis of Plan Quality Associated with Natural Hazards." *Journal of Planning and Education Research* 23(2):191-201.

Brody, Samuel, Wesley Highfield and Jung Eun Kang. 2011. *Rising Waters: The Causes and Consequences of Flooding in the United States*. Cambridge: Cambridge University Press.

Burby, Raymond J. 1995. "Coercive Versus Cooperative Pollution Control: Comparative Study of State Programs to Reduce Erosion and Sedimentation Pollution in Urban Areas." *Environmental Management* 19(3):359-370.

Burby, Raymond J. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. Washington DC: Joseph Henry Press.

Burby, Raymond J. 2006. "Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing About Wise Governmental Decisions for Hazardous Areas." *The Annals of the American Academy of Political and Social Science* 604 (March 2006):171-191.

Burby, Raymond J. Beverly A. Cigler, Steven P. French, Edward J. Kaiser, Jack Kartez, Dale Roenigk, Dana Weist, and Dale Whittington. 1991. *Sharing Environmental Risks: How to Control Government's Losses in Natural Disasters*. Boulder CO: Westview Press.

Burby, Raymond J. and Robert G. Patterson. 1993. "Improving Compliance with State Environmental Regulations." *Journal of Policy Analysis and Management* 12 (Fall): 753-772.

Burby, Raymond J. and Linda C. Dalton. 1994. "Plans Can Matter! The Role of Land Use and State Planning Mandates on Limiting Development in Hazardous Areas." *Public Administration Review* 54 (3):229-238.

Burby, Raymond J. and Peter May, with Phillip R. Berke, Linda C. Dalton, Steven P. French, and Edward Kaiser. 1997. *Making Governments Plan: State Experiments in Managing Land Use*. Baltimore MD: Johns Hopkins University Press.

Burby, Raymond J., Timothy Beatley, Philip Berke, Robert Deyle, Steve French, David Godschalk, Edward Kaiser, Jack Kartez, Robert Patterson, and Rutherford Platt. 1999. "Unleashing the Power of Planning to Create Disaster-Resistant Communities." *Journal of the American Planning Association* 65 (3):247-258.

Burby, Raymond J. and Peter J. May. 2009. "Command of Cooperate: Rethinking Traditional Central Governments' Hazard Mitigation Policies." Pp. 21-33 in *Building*

Safer Communities. Risk Governance, Spatial Planning, and Responses to Natural Hazards, edited by Urbano Fra Paleo. Washington DC: IOS Press.

Deyle, Robert E. 1995. "Integrated Water Management: Contending with Garbage Can Decisionmaking in Organized Anarchies." *Water Resources Bulletin* 31(3):387-398.

Deyle, Robert E. and Richard A. Smith. 1998. "Local Government Compliance with State Plan Mandates: The Effects of State Implementation in Florida." *Journal of the American Planning Association* 64(4):457-469.

Deyle, Robert E., Timothy S. Chapin and Earl J. Baker. 2008. The Proof of the Planning is in the Platting." *Journal of the American Planning Association* 74(3):349-370.

Federal Emergency Management Agency. 2008. *Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000*. Washington DC: Author.

Godschalk, David, R. David J. Brower, and Timothy Beatley. 1989. *Catastrophic Coastal Storms: Hazard Management and Development Management*. Durham NC: Duke University Press.

Godschalk, David, R., Timothy Beatley, Philip Berke, David J. Brower, and Edward Kaiser. 1999. *Natural Hazard Mitigation: Recasting Disaster Policy and Planning*. Washington DC: Island Press.

Godschalk, David R., Samuel Brody, and Raymond Burby. 2003. "Public Participation in Natural Hazard Mitigation Policy Formulation: Challenges for Comprehensive Planning." *Journal of Environmental Planning and Management* 46(5):733-754.

Hodge, Nathan, Lisa Fleisher and Jacob Gershman. "Irene Strains Federal Disaster Funds." *Wall Street Journal Online* 2011 (30, August). Available at http://online.wsj.com/article/SB10001424053111904199404576538741580290386.html. Accessed on August 30, 2011.

Kartez J. and C. Faupel. 1994. Comprehensive Hazard Management and the Role of Cooperation between Local Planning Departments and Emergency Management Offices. Unpublished paper.

May, Peter J. and Robert E. Deyle. 1998. "Governing Land Use in Hazardous Area with a Patchwork System." Pp. 57-82 in *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*, edited by Raymond Burby. Washington DC: Joseph Henry Press.

May, Peter J. and Walter Williams. 1986. *Disaster Policy Implementation: Managing Programs Under Shared Governance*. New York: Plenum Press.

May, P., R. Burby, N. Ericksen, J. Handmer, J. Dixon, S. Michaels, and D. Smith. 1996. *Environmental Management and Governance: Intergovernmental Approaches to Hazards and Sustainability*. London: Routledge.

McCarthy, Francis X. and Natalie Keegan. 2009. *FEMA's Pre-Disaster Mitigation Program: Overview and Issues*. Washington, D.C.: Congressional Research Service.

Mileti, Dennis. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington DC: Joseph Henry Press.

National Hazard Mitigation Association. 2012. *Position Statement: Elimination of the Pre-Disaster Hazard Mitigation Program*. Position Statement #2012-02. Available at nhma.info/uploads/board/NHMA_Position_Statement_on_PDM_2012-02.pdf

National Institute of Building Sciences. 2002. Multi-Hazard Mitigation Council. *Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities. Vol. 1, Findings, Conclusions and Recommendations.* Washington DC: National Institute of Building Sciences.

National Oceanic and Atmospheric Administration (NOAA). (2004). "Population trends along the coastal United States 1980-2008." Available at http://oceanservice.noaa.gov/programs/mb/pdfs/coastal_pop_trends_complete.pdf. Accessed on Sep. 2007.

National Research Council. 2006. *Facing Hazards and Disasters: Understanding Human Dimensions*. Washington DC: The National Academies Press.

Nelson, A., and S. French. 2002. "Plan Quality and Mitigating Damage from Natural Disasters: A Case Study of the Northridge Earthquake with Planning Considerations." *Journal of the American Planning Association* 68(2):194-207.

Olshansky, Robert and Jack Kartez. 1998. "Managing Land Use to Build Resilience." Pp. 167-202 in *Cooperating With Nature: Confronting Natural Hazard and Land Use Planning for Sustainable Communities*, edited by Ramond Burby. Washington DC: Joseph Henry Press.

Peacock, W.G., H. Kunreuther, W.H. Hooke, S.L. Cutter, S.E. Chang, and P. R. Berke. 2008. *Toward a Resiliency and Vulnerability Observatory Network: RAVON*. Report # 08-02R. College Station, TX: Texas A&M University Hazard Reduction and Recovery Center.

Smith, Gavin and Dennis Wenger. 2006. "Sustainable Disaster Recovery: Operationalizing an Existing Agenda." Pp. 234-257 in *Handbook of Disaster Research*, edited by Havidan Rodriguez, E.L. Quarantelli and Russell R. Dynes. New York: Springer.

Smith, Gavin. 2009a. "Planning for Sustainable and Disaster Resilient Communities." Pp. 221-247 in *Natural Hazards Analysis: Reducing the Impact of Disasters*, edited by John Pine. Boca Raton FL: CRC Press.

Smith, Gavin. 2009b. "Disaster Resilient Communities: A New Hazards Risk Management Framework." Pp. 249-267 in *Natural Hazards Analysis: Reducing the Impact of Disasters*, edited by John Pine. Boca Raton FL: CRC Press.

Smith, Gavin and Victor Flatt. 2011. *Assessing the Disaster Recovery Planning Capacity of the State of North Carolina*. Research Brief. Durham, NC: Institute for Homeland Security Solutions.

Smith, Gavin. 2011. *Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework*. Washington DC: Island Press.

State of North Carolina. 1999. *Hazard Mitigation Successes in the State of North Carolina*. Raleigh, NC: North Carolina Division of Emergency Management.

State of North Carolina. 2000. *Hazard Mitigation in North Carolina: Measuring Success*. Raleigh NC: North Carolina Division of Emergency Management.

Stevens, Mark. 2010. "Implementing Hazard Mitigation Provisions: Exploring the Role of that Individual Land Use Planners Can Play." *Journal of Planning Literature* 24(4):362-371.

Sylves, Richard. 2008. *Disaster Policy and Politics: Emergency Management and Homeland Security*. Washington DC: CQ Press.

United States Government Accountability Office. 2007. *Report to the Ranking Member, Committee on Financial Services, House of Representatives*. Natural Hazard Mitigation: Various Mitigation Efforts Exist, but Federal Efforts do not Provide a Comprehensive Strategic Framework. GAO-07-403, Washington DC: United States Government Accountability Office.

United States Office of Management and Budget. 2011. *Report on Disaster Relief Funding to the Committees on Appropriations and the Budget of the U.S. House of Representatives and the Senate*. Washington DC: Office of Management and Budget.

Waugh, William and Richard Sylves. 1996. "The Intergovernmental Relations of Emergency Management." Pp. 46-48 in *Disaster Management in the U.S. and Canada, 2nd ed.*, edited by R. Sylves and W. Waugh. Springfield IL: Charles C. Thomas.

Yin, Robert K. 2009. *Case Study Research: Design and Methods, 4th ed.* Los Angeles: Sage.