

Outside the Organizational Box: Local Emergency Managers and Performance Regimes*

Ann O'M. Bowman[†] Bryan M. Parsons[‡]

September 21, 2009

Abstract

To manage the uncertainty and complexity inherent in dealing with extreme events, local emergency managers have been tasked with the creation of an extensive network of supportive actors and organizations. The expectation is that these networks, or performance regimes, will facilitate collaboration and ultimately, aid in task completion. In this paper, we find evidence that collaboration has taken root in localities, but that these roots remain somewhat shallow. Moreover we find that the amount of collaboration varies: county emergency managers interact more with governmental actors, be they inside or outside the county, than with nongovernmental actors. Finally, the explanation for the patterns we uncover varies, although the amount of risk and the capacity of the county are important determinants.

*Prepared for presentation at the 10th Public Management Research Association Conference, The Ohio State University, Columbus, OH, October 2-3, 2009. The authors thank Edgar Garcia for his assistance in data collection. This research was supported by the U.S. Department of Homeland Security through the National Consortium for the Study of Terrorism and Responses to Terrorism (START), grant no. N00140510629. Any opinions, findings, conclusions, and recommendations in this article are those of the authors and do not necessarily reflect the views of the U.S. Department of Homeland Security.

[†]Professor and Hazel Davis and Robert Kennedy Endowed Chair, Bush School of Government and Public Service, Texas A&M University, College Station, TX 77843; E-mail: abowman@bushschool.tamu.edu

[‡]Doctoral Candidate, Department of Political Science, University of South Carolina, Columbia, SC 29208; E-mail: parsons.bryan.m@gmail.com

1 Introduction

On an organization chart, a local emergency manager (LEM) occupies a box typically two or three levels below the governing board, on a plane comparable to other agency heads or department directors. In terms of functional responsibility, LEMs sit at the hub of an elaborate network of actors and organizations. Since 9/11 and the establishment of the U.S. Department of Homeland Security, LEMs have been urged to construct these networks to facilitate planning for and responding to extreme events (Wise 2006). The goal of the networks is to produce an interdependent entity that, through the interactions of its participants, can solve problems more effectively than a local emergency manager could by acting alone (Agranoff and McGuire 2001, 2003). The advantages of networks lie in their ability to forge relationships and promote learning, thereby producing a collective benefit to those involved (Tierney 1985; Mintrom and Vergari 1998; Weible 2005).

Recent research suggests that city and county officials in the emergency management field have formed partnerships and increased their connections with other agencies and organizations during the past several years (MacManus and Caruson 2006; Scavo, Karney and Kilroy 2008). But to what degree has collaboration taken root in localities? Which actors and organizations dominate? And importantly, what explains the patterns that exist? These questions guide the research presented in this paper.

2 Collaborative Networks and Performance Regimes

Tremendous uncertainty and complexity characterizes disaster management, complicating all phases of the effort: planning and preparation, mitigation, response and recovery. Local levels of government, especially counties, are involved throughout the process. Indeed, counties are often the jurisdictions with the greatest responsibility in managing a wide range of extreme events (Clarke 2006; Brudney and Gazely 2009).¹ Within a county's organizational structure, LEMs occupy various niches two to three levels below the governing board. For example, in North Carolina, some LEMs lead stand-alone departments with a direct reporting line to the county manager. Others are positioned as a division director within a public safety department or a fire marshal's office. In counties with a more extensive upper-level administrative structure, LEMs report to a deputy county manager. Within this organizational variation, one pattern is clear: in only a small number of counties does the LEM possess the authority to report directly to the governing board.

To address some of the uncertainty and complexity inherent in disaster management, these mid-level LEMs are expected to create an extensive network of supportive actors and organizations. This corresponds to the prescriptions of management scholars who contend that these networks will facilitate collaboration and ultimately, aid in task completion. Wise (2006) advocates an adaptive management approach, one that relies heavily on the development of interagency networks both within and across jurisdictions. These networks bring

different agencies, organizations, and actors into an interdependent entity for the purpose of solving problems more effectively than by acting alone (Agranoff and McGuire 2001; 2003). With their capacity for building relationships and promoting learning, networks are a structure seemingly well-suited for dealing with extreme events of all types (see Tierney 1985; Mintrom and Vergari 1998; Weible 2005). Cross-cutting interactions produce a collective benefit that would be less likely to emerge if each actor, group, or jurisdiction acted individually. It is the responsibility of mid-level LEMs to reach out to potential participants in an effort to establish these networks.

Since 9/11 and the creation of the U.S. Department of Homeland Security, the number of local emergency management networks has increased. Recent studies confirm the trend. Research on homeland security programs in Florida jurisdictions showed that the connection between the state and its localities had intensified over time (MacManus and Caruson 2006; see also Caruson and MacManus 2006). Additional evidence of collaborative behavior was reported in a survey sponsored by the International City/County Management Association. Respondents indicated that they included various mutual aid partners in their emergency planning and preparedness activities (Scavo, Kearney, and Kilroy 2008). Data from a national survey of county emergency management professionals showed that the most frequent public-sector partners were constituent cities, other counties, and state emergency management agencies (Clarke 2006). The most typical forms that the collaborations took were informal agreements and joint planning activities. Beyond the public sector, private voluntary organizations such as the American Red Cross and the Salvation Army played a role, especially in responding to extreme events.

Clarke and Chenoweth (2006) offer a different perspective on the role of networked organizations in emergency management. Drawing on Clarence Stone's (1989; 1998) work on urban regimes, they advocate the construction of performance regimes as a viable strategy for local governments faced with issues of risk and vulnerability. Performance regimes are like networks: they allow local governments to build coalitions and connect with community actors in order to solve their collective action problems. Performance regimes involve governance arrangements, differentiating them somewhat from generic partnerships and other collaborative networks. Moreover, these regimes are geared toward action, toward goal accomplishment. In the case of emergency management, regimes organize the efforts of disparate stakeholders to achieve the shared goal of reducing vulnerability to extreme events. These regimes are more than basic outreach networks, they are what Agranoff (2007) refers to as "action networks."

Whatever its substantive focus, a regime faces three fundamental and sequential challenges: mobilization, sustainability, and durability (Clarke and Chenoweth 2006). These challenges underscore the potential fragility of networked organizations. In the case of extreme events, the potential participants in performance regimes include governmental entities such as emergency management officials, local governing boards, school districts, and state government along with nongovernmental actors such as nonprofit organizations, private businesses, and citizen and faith-based groups.

Performance regimes are dynamic entities. Mobilization, the first step in creating a performance regime, involves the identification and enlistment of important stakeholders (e.g.,

emergency personnel, public safety officials, educators, business leaders, nonprofit groups) in the pursuit of a collective goal. Given that potential participants may have differing perspectives on the issue and that LEMs often have few incentives to offer to induce cooperation, mobilization is neither automatic nor simple. To spur participation, LEMs are encouraged to provide opportunities for stakeholders to exchange information and engage in meaningful dialogue. Low levels of interdependence among participants may create instability and hinder the further development of the regime.

Once a performance regime is created, it can be difficult to sustain the involvement of stakeholders. Sustainability requires interaction of a different type; simply exchanging information is not sufficient to maintain involvement. In the case of extreme events, once the threat subsides and the rallying event fades from collective memory, participation in the regime may wane. It falls upon the LEM to keep various partners engaged. In a sustained regime, actors embrace shared goals and can adapt to new circumstances. LEMs remain the central actors in the regime but the roles for other participants expand as the regime matures; other participants may be tasked with the responsibility of developing new ideas for the regime. If successful, the amount of cohesion within the regime increases.

Durable performance regimes are those that become institutionalized. Long-term coalitions are enhanced when external resources are available, but absent resources, performance regimes struggle to maintain the continued commitment of participants. Not surprisingly, frequent disagreements among participants can hinder the durability of a regime (Clarke and Chenoweth 2006). There is no explicit timetable for achieving durability, but it can be identified by behaviors such as the development of consistent management practices among participants and often the creation of a formal organization. In the performance regime framework, durability does not signal ossification. Durable performance regimes are adept at shedding shopworn approaches and adopting new methods. They continue to learn and evolve.

The logic behind local performance regimes is plausible and initial research on five local jurisdictions suggests that regimes have been constructed by LEMs (Bowman and Parsons 2009). However, the relative sustainability and durability of the regimes remains undetermined. Moreover, the participation of potential actors needs additional exploration. Have LEMs been successful in rallying local businesses and faith-based organizations and bringing them into the regime? Is there more interaction between the LEM and governmental actors within the county than beyond it? In the next section, we extend the theory of performance regimes and set out our expectations.

3 Performance Regimes and Extreme Events

Central to Clarke and Chenoweth's (2006) argument is the notion that performance regimes experience three sequential developmental challenges: mobilization, sustainability, and durability. Many regimes mobilize, but only a subset of them achieves sustainability, and fewer

still become durable. The performance regime framework explicitly recognizes that starting up is different from maintenance which is different from institutionalization. This contention has yet to be explored in the literature and we do so here. We anticipate that although the rates of mobilization may be relatively high, the incidence of sustainability and durability is likely lower. This expected variation is not a simple function of time. LEMs have been formally tasked with building collaborative networks since the advent of the U.S. Department of Homeland Security and there is ample data showing that they have done so. There has been sufficient opportunity to move regimes beyond the entry-level stage of mobilization. But as Agranoff (2007) reminds us, network leadership is not a matter of traditional command-and-control practices, instead it requires steering and “soft guidance.”

We further refine the argument by contending that the involvement of certain groups of stakeholders – regardless of the specific regime challenge – varies. For instance, it is easier for a local emergency manager to engage the participation of actors with whom the LEM interacts on a regular basis as opposed to those with whom the interaction is more episodic (Agranoff 2007). For example, in the face of natural disasters, school districts tend to collaborate with other school districts more than they do with business organizations (Hicklin, et al. 2009). Jurisdictional boundaries may pose a potential constraint on the development of a fully flourishing performance regime. However, the number of county emergency managers collaborating with state emergency management agencies and other counties is about the same or slightly higher than with cities and school districts within the county (McGuire 2009). Sorting out the types of actors and their level of involvement in emergency management performance regimes seems an important next step.

We offer four general sets of explanations for performance regimes and the amount of interaction between LEMs and various actors: risk, capacity, vulnerability, and stability. Risk reflects the level of threat a jurisdiction faces, that is, the likelihood or probability that a particular area will experience an extreme event (e.g., a tornado, hurricane, or terrorist attack). Communities facing the greatest risk are likely to be those that have developed their performance regimes beyond the basic mobilization stage (Brudney and Gazley 2009). However, the relationship between risk and LEM’s interactions with participants in performance regimes may not be linear.

Capacity is the ability of a jurisdiction to deal with an extreme event. And although one might expect a straightforward relationship between capacity and collaborating with different actors, there is reason to expect the opposite. Olson (1971) suggests that groups imbued with greater capacity are more likely to work alone, whereas groups that lack resources will be more likely to engage others in their efforts to achieve a specific goal. Extending this reasoning to performance regimes, LEMs in counties that have sufficient capacity may develop weaker ties to other government and nongovernment actors (Bowman and Parsons 2009). On the other hand, LEMs with fewer resources likely have greater incentive to construct a stronger performance regime by involving other participants from the community.

Vulnerability refers to the overall effect an extreme event has on an area, which can differ according to various location-specific characteristics such as population density, the presence of a vulnerable population (e.g., elderly, low-income, or mobile home residents) or the

lack of sufficient emergency preparation (Bankoff, Frerkes, and Hilhorst 2004; Clarke and Chenoweth 2006; Cutter 2006; Cutter, Boruff, and Shirley 2003). In counties with greater vulnerability, LEMs may experience additional pressures to create effectively-functioning performance regimes.

Stability is another important aspect of the community environment in which the LEM operates. By virtue of their growth, some counties may have greater need for problem-solving performance regimes. Thus one would expect to see LEMs making concerted efforts to reach out to a mix of stakeholders. However the instability created by the population growth may make the establishment of performance regimes all the more difficult in these counties.

Beyond the general explanations, we theorize that an LEM's efforts to network with different types of potential participants are related to characteristics of the participant group itself. The number of incorporated areas, the level of unity in the governing board, the amount of social capital, and the number of bordering counties likely affect an LEM's pattern of interaction.

Although overcoming the challenges of mobilization, sustainability, and durability is necessary in constructing successful performance regimes, the underlying mechanism by which these challenges are met is the interaction of LEMs with potential participants. The analysis that follows focuses on the frequency of interaction between the LEM and stakeholders in locally-based performance regimes.

4 Data and Methods

The hypotheses are tested using data from a survey of emergency managers in North Carolina counties.² The survey was funded by a grant from the Department of Homeland Security and the National Center for the Study of Terrorism and Responses to Terrorism (START). The survey was administered in the fall of 2008 with the goal of collecting information on the level of interaction between county-level emergency managers and a range of governmental and nongovernmental actors. Therefore, these data allow for an examination of the factors that may facilitate or hinder the extent to which local governments mobilize, sustain, and create durable performance regimes in emergency management (Clarke and Chenoweth 2006).

A one-page survey was sent via postal mail to all 100 counties in North Carolina, addressed to the director of emergency management and enclosed with a small gift (i.e., \$5.00 gift card) as a financial incentive to complete the survey. Respondents were asked to either return the completed survey in a pre-paid envelope (enclosed with survey) or fax to the Department of Political Science at the University of South Carolina. Also, reminder e-mails were sent approximately two weeks after the surveys in an attempt to enhance the response rate. After an initial wave of responses, follow-up telephone calls were made to non-responding counties to encourage submission of the survey. Overall, responses were obtained from 79 of 100 counties, which provides a sufficiently representative sample of county emergency managers

in North Carolina.³ For example, responses were obtained from urban counties and most major metropolitan regions in North Carolina, in addition to a broad range of rural counties.

The survey was designed to evaluate the nature and frequency of interaction between emergency managers and potential participants in local performance regimes, including: *cities and towns, school districts, local businesses, faith-based groups, other non-profit groups, emergency managers in nearby counties, state government agencies, and federal government agencies*. In other words, the unit of analysis is the county-participant dyad, which is a common approach in the growing body of literature that explores the structure of interpersonal and organizational ties in collaborative management networks (see O’Leary and Bingham 2009).⁴ Using a scale from 1 to 10 (lower values indicate less interaction, higher values indicate greater interaction), respondents were asked to rate how often they interact with each potential participant in different capacities, such as (1) collaborating and exchanging ideas, (2) utilizing available resources, (3) delegating responsibility for generating new ideas, and (4) developing consistent management practices. In short, these survey items are expected to be representative indicators of mobilization, sustainability, and durability – the three challenges of local performance regimes (Bowman and Parsons 2009; Clarke and Chenoweth 2006).

4.1 Summary of Survey Responses

Summary statistics of responses to different survey items, categorized by regime challenge and separated by type of participant, are presented in Table 1. Governmental actors include cities and towns, as well as school districts. Nongovernmental actors include local businesses, faith-based groups, and other non-profit organizations. Finally, outside county actors include emergency management officials in nearby counties, state government agencies, and federal government agencies.

[Table 1 here]

Several points are worth noting in Table 1. While mobilization is measured by collaboration and sharing resources, sustainability is measured by delegating responsibility to certain participants. Clearly, the latter demonstrates a level of interaction characterized by greater trust, which is an important component to sustaining cooperation in management or policy networks (Agranoff 2007). It is not surprising then to find that the level of interaction reported by LEMs is higher for mobilization activities than for the sustainability activity. A regime cannot be sustained until it is mobilized. The third challenge in the creation of performance regimes is durability, measured here by developing or adapting consistent management styles with each group of actors. County emergency managers indicate a higher level of interaction on this dimension than anticipated. The findings suggest that LEMs may be making progress in creating durable regimes, even as they lag in delegating responsibility to various participants. It is important to remember that collaborative structures are not necessarily alike; some may retain elements of a hierarchical organization (McGuire 2006).

Table 1 also shows that interactions with nongovernmental participants occur much less frequently than governmental or outside county actors. LEMs are likely to interact regularly with governmental entities within the county on numerous problems and issues thus mechanisms may already exist to facilitate the interaction. With outside county actors, especially state and federal agencies, a vertical management structure may be in place. However, similar institutional structures do not exist for interactions with nongovernmental actors within the community. This makes it more difficult to engage nongovernmental groups in the nascent regime. As Bryson, Crosby, and Stone (2006, p. 52) note, the normal expectation ought to be that success will be very difficult to achieve in cross-sector collaborations. Therefore, the extent to which emergency managers develop ties with *all* relevant actors is critical in constructing performance regimes (Clarke and Chenoweth 2006). These survey items are used as dependent variables in this study in an attempt to explain how and why local governments overcome the challenges of mobilization, sustainability, and durability.

4.2 Measurement of Independent Variables

There are several independent variables used in the analysis to attempt to explain the construction of local performance regimes. Descriptive statistics for these explanatory variables are presented in Table 2. Utilizing data from the North Carolina Division of Emergency Management Annual Report (2007), the number of hazardous events in each county is used to measure the overall level of risk. This measure is based on *actual risk* instead of *potential risk* (e.g., terrorist attack), and ranges from 3 to 273.⁵ Also, a squared hazards term is created to examine the expected nonlinear effect of risk on the construction of local performance regimes. Given that low-risk counties do not experience a great enough risk to build performance regimes, and high-risk counties likely have the necessary resource capacity and organizational hierarchy of support to prepare for and respond to extreme events on their own, medium-risk counties may be most likely to build robust performance regimes to reduce their community's vulnerability to extreme events. In short, the expectation is that the effect of Hazards will be positive and the effect of Hazards² will be negative.

[Table 2 here]

County government and emergency management capacity is measured by three distinct indicators. Fiscal health is a measure of resource capacity and is created by dividing fiscal year 2007 county revenues by expenditures, which ranges from from .69 to 1.40. Therefore, the greater the value of fiscal health, the more financial resources are available to the county to allocate to emergency preparedness and response to extreme events. Regarding its impact on performance regimes, the expectation is that counties with greater resource capacity have less need for additional support from other actors, and will thus create weaker performance regimes. The measure of county population is derived from 2006 estimates from the U.S. Census Bureau and ranges from 4,187 to 827,445, and is also expected to exert an influence

on preparedness efforts (Gerber et al. 2005; Gerber and Robinson 2009). Finally, professionalism is a dichotomous measure of whether the county emergency manager has held the same position from 2005 to 2008, with a 1 for “yes” and 0 for “no.” While this is admittedly a limited measure of professionalism, the logic behind its inclusion in this study is twofold. First, recent work finds that professionalism is an important antecedent to collaboration with various actors in management networks (McGuire 2009). Second, emergency managers with more experience may have developed more relationships with governmental and nongovernmental actors in their community, both in quantity and quality. Therefore, the professionalism variable may capture one or both of these relationships, and is expected to differ in direction from the other capacity variables.

In addition to risk, this work uses separate measures of vulnerability. The Social Vulnerability Index (SoVI 2000) is comprised of several indicators that capture a county’s vulnerability to threat, that is, the extent to which an extreme event would adversely affect an area. To create the Social Vulnerability Index (SoVI), Cutter and colleagues (2003) conduct a factor analysis of 48 county-level variables and produce an index with 11 component dimensions of vulnerability that ranges from -5.81 to 4, with positive values indicating greater vulnerability.⁶ Overall, the expectation is that more vulnerable counties will construct stronger regimes and thereby be more likely to overcome the challenges of mobilization, sustainability, and durability. Vulnerability is also measured by population density, with the expectation that more densely populated counties will be more vulnerable to hazardous events, and thus more likely to reach out to potential participants within the community for assistance in preparedness and response.

County stability is measured by a single variable for population change, from 2000 to 2006. The expectation is that counties experiencing greater demographic change more find it more difficult to build and sustain working relationships with various actors within the community. Additional explanatory variables are included in the analysis for specific sets of actors. The number of incorporated areas is included based on the expectation that more incorporated cities and small towns reflects a greater potential for collaboration. Unified government is created by calculating the absolute value of the difference between the number of Republicans and Democrats on county council in 2008, with the expectation that a county government dominated by a single political party may be less likely to instill a pattern of collaboration with a diverse set of governmental and nongovernmental actors. Social capital is measured by the number of non-profit organizations in each county and reflects a greater potential for collaboration with nongovernmental actors. Similarly, the number of bordering counties also represents a greater potential for collaboration, but with outside county actors such as emergency management officials in nearby counties. Finally, because the expectation is that mobilization, sustainability, and durability occur sequentially in the development of performance regimes, the composite measure of mobilization (i.e., collaboration, sharing resources) will be included in models of sustainability, while both mobilization and sustainability will be included in models of durability.

In sum, the purpose of this study is to explain how and why local governments overcome collective action problems by constructing performance regimes to reduce county vulnerability to extreme events. To do this, emergency managers in local governments must overcome

three important challenges, including mobilizing a diverse set of actors, sustaining cooperation during periods of inactivity, and creating durable regimes by institutionalizing working relationships with governmental, nongovernmental, and outside county actors (Bowman and Parsons 2009; Clarke and Chenoweth 2006). The relationship between these challenges and a broad range of explanatory variables is the focus of the following analyses.

5 Findings

To provide an initial examination of the three performance regime challenges, base models are constructed with variables for risk, county government and emergency management capacity, vulnerability, and stability (see Table 2). The dependent variables for mobilization, sustainability, and durability are continuous, and thus ordinary least squares regression is utilized. It is important to reiterate that the unit of analysis in this study is the county-participant dyad, albeit the explanatory variables are primarily measured at the county level. Therefore, the interpretation of findings will focus on the impact of certain variables on county-participant interactions. Additionally, to capture differences in interaction patterns with potential participant groups, OLS models are estimated across type of actor (i.e. governmental, nongovernmental, outside county; also see Table 1) for the models of mobilization, sustainability, and durability. Table 3 presents the results of the base models of local performance regimes.

[Table 3 here]

Although the model results in Table 3 do not completely explain how local governments overcome the challenges of performance regimes, they do provide some insight into the process. First, there is some support for the expectation that risk produces a nonlinear effect on the construction of performance regimes, as indicated by the statistically significant coefficient estimates for Hazards² in the mobilization and durability models, even though the linear Hazards term does not reach statistical significance. The negative effect of Hazards² suggests that the strength of county-participant interactions decreases with a greater number of hazards in a particular county.

The results in Table 3 provide mixed support for the expected effects of government capacity. For instance, although fiscal health produces an effect on mobilization contrary to our initial expectation, a one unit increase in fiscal health corresponds to a nearly one unit decrease in sustainability. Also, professionalism exerts a negative impact on sustainability, which suggests that LEMs with more experience delegate less responsibility to potential participants. County population produces the expected effect on mobilization and durability, that is, LEMs in more populous counties are less likely to mobilize potential participants and create durable regimes because they are capable of fulfilling emergency management duties without additional community support.

Finally, population density, an indicator of county vulnerability, exerts a positive influence on mobilization and durability. For example, a 1,000 unit increase in density produces a 3 unit increase in the extent to which LEMs adapt consistent management styles with various governmental, nongovernmental, and outside county actors. While the results for the base models provide some explanation of how counties overcome these challenges, it is important to next examine mobilization, sustainability, and durability separately, as well as the effects of additional explanatory variables across the different sets of regime participants.

5.1 Mobilization

In order to examine the factors important in the mobilization of potential participants, OLS models are estimated for all actors and for each actor type. The mobilization model results are presented in Table 4. Overall, the results provide mixed support for some of the initial expectations.⁷

[Table 4 here]

There are several notable findings in Table 4. With regard to the capacity variables, fiscal health and professionalism, some of the results run counter to our initial expectations. First, with the exception of nongovernmental actors, fiscal health produces a positive impact on mobilizing governmental and outside county participants. All of the actors in these two groups are governmental entities; perhaps LEMs in well-resourced counties can help subsidize the involvement of cities, school districts and other counties in the regime. However, professionalism displays a positive and statistically significant effect only on interactions with nongovernmental actors. It may be the case that experienced emergency managers make the effort to incorporate cross-sectoral participants from within the community in disaster preparedness and emergency response. Our indicator of stability, population change, also performs contrary to expectations. In fact, with respect to cities, towns, and school districts, population growth seems to stimulate outreach on the part of LEMs. Finally, the variables intended to capture specifics of each of the participant groups fail to produce the expected results.

Consistent with the previous results for the base models, the evidence suggests that risk produces a nonlinear effect on the county emergency manager's interaction with potential participants, with the strongest effect appearing in the model of nongovernmental actors. In other words, as the number of hazards increases in a particular county, the strength of interaction with potential participants increases; however, as the number of hazardous events continues to increase, the strength of interaction declines with respect to mobilization activities, such as collaborating and exchanging ideas and sharing available resources.

[Figure 1 here]

The nonlinear effect of risk on mobilization is illustrated by the predicted values and confidence intervals plotted in Figure 1. The figure demonstrates that as the number of hazards increases, the effect on mobilization initially increases and then declines considerably as counties experience a greater number of hazardous events. Although the predicted nonlinear effect of risk is associated with much larger confidence intervals, this is a function of fewer observations at higher values of the hazards variable. In short, Figure 1 provides evidence to support the expectation that LEMs in low- and high-risk counties create weaker performance regimes, whereas LEMs in counties with medium or average levels of risk are most likely to mobilize participants in the process of preparing for and responding to extreme events.

5.2 Sustainability

The results for the sustainability models, also separated by actor type, are presented in Table 5. The first important result in the sustainability models is the distinct effect of risk on sustainability, particularly compared to its effect on mobilization. While the effect of risk is not in the expected direction, the nonlinear effect is intriguing. The findings suggest that as counties experience a greater number of hazardous events, emergency managers are less likely to sustain the cooperation of participants in emergency management related activities; however, the squared hazards term indicates that as hazards continue to increase, the effect changes in a positive direction. The predicted nonlinear effect of risk on sustainability, with confidence intervals, is plotted in Figure 2.

[Table 5 here]

[Figure 2 here]

In contrast to the nonlinear effect plotted in Figure 1, the effect of risk on sustainability is quite different in Figure 2. For instance, in low- and high-risk counties, LEMs seem to interact more regularly with potential participants by delegating responsibility for developing new ideas in emergency preparedness and response, while medium-risk counties are less likely to do so. Low- and high-risk counties may be more likely to sustain the cooperation because (1) low-risk counties rely on the involvement of available community actors in the event of a disaster and (2) high-risk counties experience hazards on a sufficiently frequent basis to sustain the continued involvement of participants in local performance regimes. Although Figure 1 suggests that LEMs in these counties are less likely mobilize participants, Figure 2 suggests that they may be better suited to sustain participant cooperation in performance regimes when/if they are initially successful at overcoming the mobilization challenge. Finally, the wider confidence intervals in Figure 2 are attributed to fewer observations at higher values of the hazards variable.

In addition, there are several important findings in Table 5, most of which provide consistent evidence for the expectations regarding the effects of government capacity, stability, and

mobilization on sustaining cooperation in performance regimes. First, fiscal health produces the expected negative effect on sustainability, that is, emergency managers in counties with an excess in revenues are less likely to sustain regular interaction in terms of delegating responsibility to governmental and nongovernmental participants. The logic behind this argument and result is that these counties have greater resource capacity and have less need for sustaining the participation of regime participants, as the excess in resources provides the necessary financial support to prepare for and respond to extreme events. The other capacity variable, professionalism, performs similarly. Professionalism is important in mobilizing nongovernmental actors, but when it comes to sustaining their involvement of outside county actors, professionalism has a negative effect.

Second, the stability of a county's population exerts an important effect on sustainability, as indicated by the negative coefficient estimate for population change. Emergency managers in counties that experience rapid population growth, and thus an unstable foundation of community involvement in emergency management, may find it increasingly difficult to sustain the participation of various actors in local performance regimes. Also, social capital produces a statistically significant effect on sustainability, indicating that a greater number of non-profit organizations in a particular county increases the level of interaction between LEMs and regime participants with respect to the delegation of responsibility.

Third, the statistically significant coefficient estimates on the mobilization term across all models provide robust support for the argument that these three challenges occur in sequential order, that is, a county emergency manager must mobilize participants before sustaining their involvement in performance regimes (Bowman and Parsons 2009; Clarke and Chenoweth 2006). For instance, a 2σ increase in mobilization corresponds to a 3.71 unit increase in the extent to which LEMs give responsibility for developing new ideas to various governmental, nongovernmental, and outside county participants, a critical component to overcoming the sustainability challenge (Clarke and Chenoweth 2006).

Finally, unified government produces an interesting effect on sustaining the cooperation of governmental actors. Perhaps this finding is attributed to a homogeneous vertical management structure that extends down from a unified/partisan county government to the public officials who serve in leadership positions of cities, small towns, and school districts. However, in order to fully understand the sequential process by which emergency managers construct robust performance regimes, we must also examine how local governments overcome the challenge of durability and move toward institutionalizing the partnerships with these regime participants.

5.3 Durability

The results for the durability models for all actors and different actor types are presented in Table 6. Similar to the effect of risk on mobilization, risk produces the expected nonlinear effect on durability in three of the four models. For instance, LEMs in counties experiencing a greater number of hazards interact more regularly with governmental and nongovernmental

actors with respect to adapting consistent management styles; however, as hazards continue to increase, county emergency managers are less likely to take steps to create durable performance regimes.

[Table 6 here]

[Figure 3 here]

The nonlinear effect of risk on durability is illustrated by the predicted values and confidence intervals plotted in Figure 3. Emergency managers in low- and high-risk counties do not develop consistent management styles with participants in performance regimes to the same degree as those in medium- or average-risk counties. Perhaps this pattern of interaction occurs because counties that face minimal or substantial risk either (1) have little incentive to establish lasting partnerships or (2) possess sufficient resource capacity to fulfill emergency management duties alone. However, given the significant differences across mobilization, sustainability, and durability, additional research is needed to assess the nature of the relationship between level of risk and the construction of local performance regimes.

There are several important findings also presented in Table 6. A county's fiscal health exerts a substantial influence on the durability of performance regimes, particularly in the interaction with outside county actors. For example, a one unit increase in fiscal health corresponds to a -2.24 decline in the frequency with which county emergency managers develop consistent management styles with emergency managers in nearby counties, state government agencies, and federal government agencies. This is an important finding, as it indicates that LEMs in counties with less financial capacity will interact more regularly with horizontal and vertical governmental actors, perhaps adapting their public management styles as a requirement for receiving external funding. Professionalism, the other capacity variable, exerts a positive impact on interactions about management practices, especially with nongovernmental actors. Given the difficulties of harmonizing public management practices with those of the private sector, perhaps it is not surprising that experienced LEMs devote substantial time to this exercise.

The indicators of vulnerability produce the expected effects on durability. First, LEMs in more densely populated counties create more durable and institutionalized performance regimes because they face a greater collective vulnerability to extreme events, a fundamental argument in the theory of local performance regimes in emergency management (Clarke and Chenoweth 2006). Second, this finding also holds for the Social Vulnerability Index (SoVI), albeit primarily with nongovernmental actors. In other words, LEMs in counties with greater social vulnerability are more likely to institutionalize the participation of nongovernmental actors, such as faith-based groups and businesses, in order to carry out emergency management duties. Finally, since population change reflects inherent instability in county demographics that are likely to hinder the development of durable partnerships with actors in the community, the statistically significant effect of population change variable on durability is in the expected negative direction.

In the full model, the number of bordering counties produces a statistically significant positive effect on durability. For example, a 2σ increase in county borders corresponds to a nearly .40 increase in durability, indicating that the potential for partnerships with nearby counties is an important (albeit small) factor in the construction of performance regimes. Also, while unified government produced a positive impact on sustainability, the findings here indicate that unified government decreases the extent to which county emergency managers develop consistent management styles with governmental actors. At first, this may appear to be somewhat counterintuitive, as LEMs embedded in a more homogeneous county government may be more likely to create institutionalized partnerships with cities, small towns, and school districts. However, Clarke and Chenoweth (2006) argue that stringent hierarchical management structures, as well as command-and-control approaches to emergency management, stifle the cooperation of potential participants and are a detriment to durable performance regimes (see McGuire 2006).

Finally, a characteristic fundamental to the concept of local performance regimes is that the three challenges occur in sequential order (Bowman and Parsons 2009; Clarke and Chenoweth 2006). In other words, a diverse set of actors must first be mobilized to participate in local preparedness efforts before their cooperation can be sustained, both of which occur before the working relationships and partnerships are institutionalized in a durable regime. The findings in Table 6 provide evidence to confirm these expectations. Coefficient estimates for both mobilization and sustainability reach statistical significance in all models ($p\text{-value} < .01$), which indicates that the first two challenges are powerful explanatory variables in understanding how local governments adapt consistent management styles with a diverse set of governmental, nongovernmental, and outside county actors. The process by which LEMs facilitate the construction of durable performance regimes is critical to overcoming collective action problems and reducing their community's vulnerability to extreme events.

6 Conclusion

The results of the statistical analyses are mixed, but certainly interesting. And we acknowledge the possibility that our operationalizations of some of the concepts may contribute to the occasionally unstable results. Although we would have preferred a set of robust findings across each of the models, the results do offer some thought-provoking implications for local emergency management and performance regimes.

First, the three challenges of performance regimes posited by Clarke and Chenoweth (2006) appear to be sufficiently distinct and different. It is important to have provided empirical confirmation of this point. What it takes to mobilize potential regime participants is not necessarily what it takes to sustain their participation, or to make the network durable. Moreover, these challenges appear to be sequential: mobilization goes a long way in explaining sustainability; both of them help explain durability. Second, our contention that the interactions of local emergency managers vary based on the type of potential regime participant is also borne out in the data. LEMs engage with nearby governmental actors differently

than they do with governmental entities outside the county. Furthermore, their interactions with nongovernmental actors often stand in contrast to their dealings with governmental actors.

Asking LEMs to reach outside their organizational boxes and create functioning action networks is a tall order. The nature of the task varies based on the stage (mobilization, sustainability, or durability) and the type of potential participant (governmental, nongovernmental, outside of the county). Clearly, LEMs have made headway in mobilizing potential participants, less so in sustaining their participation or achieving a durable regime. To be sure, creating a viable network of disparate participants involves a substantial amount of mutual learning and adjustment (Agranoff 2006). And it raises the issue of borders and the role they may play in tamping down regime formation. Despite growing interactions, it remains difficult to manage, in the words of O’Toole, Meier, and Nicholson-Crotty (2005) “upward, downward, and outward,” which is precisely what LEMs have been tasked with. In future research, we intend to explore these and other issues in more depth. Of particular interest is whether, in the absence of an extreme event, performance regimes thrive or wilt. Another compelling question involves the county governing board and its willingness to nurture regime development. And finally, do these performance regimes, once sustained and durable, actually deliver on their promise?

Notes

¹The phrase “extreme event” is commonly used to refer to various disasters and hazards, whether human-caused or naturally-occurring.

²The state of North Carolina is comprised of 100 counties, stretching from the Atlantic Ocean to the Appalachian Mountains, that range in population from 4,700 to 827,000 residents and in land area from 173 square miles to 949 square miles. The state’s political culture tends toward traditionalism with significant pockets of moralism in the western part of the state (Elazar 1984). North Carolina enjoys relative prosperity and growth compared to its southern counterparts and it is generally considered somewhat more progressive. The state treats its counties “as significant instruments of local government,” empowering them with considerable decision making authority (Fleer 1994, p. 198). All counties are governed by a board of county commissioners and all but a handful of counties operate with an appointed county manager. Like counties throughout the country, North Carolina counties vary in the threat of extreme events, in terms of both risk and vulnerability. Their capacity to deal with these events and the stability of the local population vary as well.

³The responding and non-responding counties are not disclosed due to confidentiality promised to survey respondents.

⁴Although this study attempts to explain the nature and level of county-participant interactions, many of the independent variables in the analyses are only measured at the county level. One on hand, counties are central actors in the implementation of emergency management (Brudney and Gazley 2009; Comfort 2002; Waugh 1994; Waugh and Streib 2006; Waugh and Sylves 2002), and thus any variation in county-level characteristics is likely to influence the construction of performance regimes. On the other hand, in the absence of additional data on specific county-participant dyads, this limits the extent to which this study can fully explain the mobilization, sustainability, and durability of local performance regimes.

⁵Hazards include events reported by each county, such as weather-related events (e.g., watches, warnings, storm reports), hazardous material spills, event or training exercise at a fixed nuclear facility, events involving radiological materials unrelated to an on-site fixed nuclear facility, search and rescue operations, fires, citizen complaints about potential hazards (e.g., illegal dumping, odors), and an “other” category that includes an event not listed or a resource request in response to an event (North Carolina Division of Emergency Management Annual Report 2007).

⁶Of the 11 component dimensions of the Social Vulnerability Index, the dominant variables include: *per capita income, median age, number of commercial establishments per square mile, % employed in extractive industries, % housing units that are mobile homes, % African American, % Hispance, % Native American, % Asian, % employed in service occupations, and % employed in transportation, communication, and public utilities* (Cutter et al. 2003, p. 252)

⁷Due to multicollinearity between county population (2006) and social capital, and because there are two other measures of capacity (i.e., fiscal health, professionalism), county population is dropped from models of mobilization, sustainability, and durability.

References

- Agranoff, Robert. 2007. *Managing within Networks: Adding Value to Public Organizations*. Washington, DC: Georgetown University Press.
- Agranoff, Robert, and Michael McGuire. 2001. "Big Questions for Public Networks Management Research." *Journal of Public Management Research and Theory* 11: 205-327.
- Agranoff, Robert, and Michael McGuire. 2003. *Collaborative Public Management*. Washington: Georgetown University Press.
- Bankoff, Greg, and George Frerks, and Dorteia Hillhorst, eds. 2004. *Mapping Vulnerability: Disasters, Development, and People*. London and Sterling, VA: Earthscan.
- Bowman, Ann O'M., and Bryan M. Parsons. 2009. "Vulnerability and Resilience in Local Government: Assessing the Strength of Performance Regimes." *State and Local Government Review* 41(1): 13-24.
- Brudney, Jeffrey L., and Beth Gazley. 2009. "Planning to be Prepared: An Empirical Examination of the Role of Voluntary Organizations in County Government Emergency Planning." *Public Performance & Management Review* 32(3): 372-399.
- Bryson, John M., Barbara C. Crosby, and Melissa Middleton Stone. 2006. "The Design and Implementation of Cross-Sector Collaborations: Propositions from the Literature." *Public Administration Review* 66: 44-55.
- Caruson, Kiki, and Susan A. MacManus. 2006. "Mandates and Management Challenges in the Trenches: An Intergovernmental Perspective on Homeland Security." *Public Administration Review* 66: 522-536.
- Clarke, Susan E., and Erica Chenoweth. 2006. "The Politics of Vulnerability: Constructing Local Performance Regimes for Homeland Security." *Review of Policy Research* 23: 95-114.
- Clarke, Wes. 2006. *Emergency Management in County Government: A National Survey*. Athens: University of Georgia Carl Vinson Institute of Government and the Center for the Study of Counties.
- Comfort, Louise K. 2002. "Rethinking Security: Organizational Fragility in Extreme Events." *Public Administration Review* 62(Special Issue): 98-107.
- Cutter, Susan L. 2006. *Hazards, Vulnerability, and Environmental Justice*. London and Sterling, Earthscan.
- Cutter, Susan L., Bryan J. Boruff, and W. Lynn Shirley. 2003. "Social Vulnerability to Environmental Hazards." *Social Science Quarterly* 84: 242-261.
- Elazar, Daniel J. 1984. *American Federalism: A View from the States*. New York: Harper & Row.

- Fleer, Jack D. 1994. *North Carolina Government and Politics*. Lincoln: University of Nebraska Press.
- Gerber, Brian J., David B. Cohen, Brian Cannon, Dennis Patterson, and Kendra Steward. 2005. "On the Front Line: American Cities and the Challenge of Homeland Security Preparedness." *Urban Affairs Review* 41: 182-210.
- Gerber, Brian J., and Scott E. Robinson. 2009. "Local Government Performance and the Challenges of Regional Preparedness for Disasters." *Public Performance & Management Review* 32(3): 345-371.
- Hicklin, Alisa, Laurence OToole Jr., Kenneth J. Meier, and Scott E. Robinson. 2009. "Calming the Storms: Collaborative Public Management, Hurricanes Katrina and Rita, and Disaster Response." In *The Collaborative Public Manager: New Ideas for the Twenty-first Century*, eds. R. OLeary and L.B. Bingham. Washington: Georgetown University Press.
- Imai, Kosuke, Gary King, and Oliva Lau. 2007. "ls: Least Squares Regression for Continuous Dependent Variables." In Kosuke Imai, Gary King, and Olivia Lau, "Zelig: Everyone's Statistical Software," <http://gking.harvard.edu/zelig>
- Imai, Kosuke, King, Gary, and Lau, Olivia. 2008. "Toward a Common Framework for Statistical Analysis and Development." *Journal of Computational and Graphical Statistics* 17: 892-913.
- Imai, Kosuke, King, Gary, and Lau, Olivia. 2009. "Zelig: Everyone's Statistical Software." <http://GKing.Harvard.Edu/zelig>.
- MacManus, Susan A., and Kiki Caruson. 2006. "Code Red: Florida City and County Officials Rate Threat Information Scores and the Homeland Security Advisory System." *State and Local Government Review* 38: 12-22.
- McGuire, Michael. 2009. "The New Professionalism and Collaborative Activity in Local Emergency Management." In *The Collaborative Public Manager: New Ideas for the Twenty-first Century*, eds. Rosemary O'Leary and Lisa Blomgren Bingham. Washington: Georgetown University Press.
- McGuire, Michael. 2006. "Collaborative Public Management: Assessing What We Know and How We Know It." *Public Administration Review* 66: 33-43.
- Mintrom, Michael, and Sandra Vergari. 1998. "Policy Networks and Innovation Diffusion: The Case of State Education Reforms." *Journal of Politics* 60: 126-148.
- North Carolina Division of Emergency Management Annual Report. 2007. Division of Emergency Management, Department of Crime Control & Public Safety. Published March 1, 2008.

- O’Leary, Rosemary, and Lisa Blomgren Bingham, eds. 2009. *The Collaborative Public Manager: New Ideas for the Twenty-first Century*. Washington: Georgetown University Press.
- O’Toole, Laurence J., Kenneth J. Meier, and Sean Nicholson-Crotty. 2005. “Managing Upward, Downward, and Outward: Networks, Hierarchical Relationships, and Performance.” *Public Management Review* 7: 45-68.
- Olson, Mancur. 1971. *The Logic of Collective Action: Public goods and the Theory of Groups*. Cambridge: Harvard University Press.
- R Development Core Team. 2009. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org>.
- Scavo, Carmine, Richard C. Kearney, and Richard Kilroy, Jr. 2008. “Challenges to Federalism: Homeland Security and Disaster Response.” *Publius: The Journal of Federalism* 38: 81-110.
- State of South Carolina Hazards Assessment. 2002. South Carolina Emergency Management Division, Office of the Adjunct General. Columbia: Hazards Research Lab, Department of Geography, University of South Carolina.
- Stone, Clarence N. 1989. *Regime Politics*. Lawrence: University Press of Kansas.
- Stone, Clarence N. 1998. “Introduction: Urban Education in Political Context.” In *Changing Urban Education*, ed. Clarence N. Stone. Lawrence: University Press of Kansas.
- Tierney, Kathleen J. 1985. “Emergency Medical Preparedness and Response in Disasters: The Need for Interorganizational Coordination.” *Public Administration Review* 45: 77-84.
- Waugh, William L. 1994. “Regionalizing Emergency Management: Counties as State and Local Government.” *Public Administration Review* 54: 253-258.
- Waugh, William L., and Gregory Streib. 2006. “Collaboration and Leadership for Effective Emergency Management.” *Public Administration Review* 66(Special Issue): 131-140.
- Waugh, William L., and Richard T. Sylvester. 2002. “Organizing the War on Terrorism.” *Public Administration Review* 62(Special Issue): 145-153.
- Weible, Christopher M. 2005. “Beliefs and Perceived Influence in Natural Resource Conflict: An Advocacy Coalition Approach to Policy Networks.” *Political Research Quarterly* 58: 461-475.
- Wise, Charles R. 2006. “Organizing Homeland Security after Katrina: Is Adaptive Management Whats Missing?” *Public Administration Review* 66: 302-318.

Table 1: Summary of responses from survey of emergency managers in North Carolina counties. Response μ and σ (in parentheses) listed below.

Survey Items:	Participants/Actors			
	All Actors	Governmental	Non-Governmental	Outside County
Mobilization				
Collaborate and exchange ideas with:	6.17 (2.59)	6.39 (2.35)	4.85 (2.28)	7.19 (2.46)
Utilize available resources of:	5.90 (2.62)	6.62 (2.45)	4.95 (2.40)	6.38 (2.67)
Sustainability				
Give responsibility in developing new ideas to:	4.92 (2.60)	5.20 (2.40)	4.11 (2.33)	5.53 (2.79)
Durability				
Develop consistent management practices with:	5.88 (2.66)	6.18 (2.42)	4.75 (2.44)	6.82 (2.62)

Note: Using a scale from 1 to 10 (low numbers indicate less interaction, high numbers indicate more interaction), respondents rated their level of interaction with possible participants in emergency management, including: *Cities and Towns, School District(s), Local Businesses, Faith-based Groups, Other Non-profit Groups, EM Officials in Nearby Counties, State Government Agencies, and Federal Government Agencies.*

Table 2: Descriptive statistics of independent variables.

Independent Variables	μ	σ	Min	Max
<i>Risk</i>				
Hazards	31.63	39.23	3	273
Hazards ²	2537.70	9279.49	9	74,529
<i>Capacity</i>				
Fiscal health	1.04	.15	.69	1.40
County population (2006)	89,887.53	135,165.60	4,187	827,445
Professionalism	.64	.47	0	1
<i>Vulnerability</i>				
SoVI (2000)	-1.22	2.28	-5.81	4
Population density	161.69	211.13	9.5	1,322.22
<i>Stability</i>				
Population change (2000-2006)	.07	.08	-.11	.34
<i>Other explanatory variables</i>				
Incorporated areas	5.81	3.85	1	19
Unified government	3.79	2.16	1	8
Social capital	546.27	1,055.58	30	6,690
Bordering counties	5.41	1.95	2	9
Mobilization	12.08	4.91	2	20
Sustainability	4.92	2.60	2	10

Table 3: Basic model of local performance regimes.

Independent variables	Challenges		
	Mobilization	Sustainability	Durability
Hazards	.020 (.016)	-.009 (.008)	.007 (.008)
Hazards ²	-.00009** (.00005)	-.000004 (.00003)	-.00005** (.00003)
Fiscal health	3.282*** (1.318)	-.935* (.704)	.148 (.726)
County population (2006)	-.00001** (.000004)	.000002 (.000002)	-.000003* (.000002)
Professionalism	.388 (.412)	-.417** (.220)	.177 (.224)
SoVI (2000)	.031 (.089)	.044 (.047)	.042 (.048)
Population density	.004** (.002)	.0008 (.001)	.003*** (.001)
Population change (2000-2006)	3.870* (2.390)	-1.451 (1.277)	.033 (1.302)
Constant	7.901*** (1.419)	6.273*** (.758)	5.330*** (.780)
Adj. R ²	.01	.004	.01
N	631	631	631

Note: Above are coefficient estimates and standard errors from ordinary least squares regression models for county-participant dyads. The data are obtained from survey responses of emergency managers in North Carolina counties.

*** p-value < .01, ** p-value < .05, * p-value < .10 (one-tailed test)

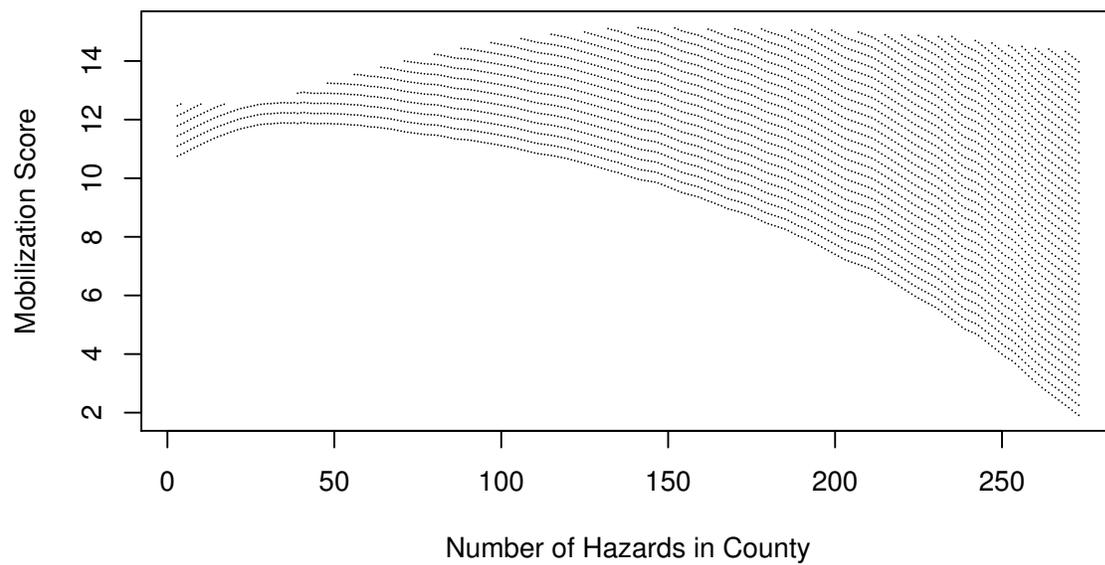
Table 4: Mobilizing participants in local performance regimes, by collaborating and exchanging ideas as well as utilizing available resources with various participants.

Independent variables	Participants/Actors			
	Full Model	Governmental	Non-Governmental	Outside County
Hazards	.0274* (.0174)	.0003 (.0294)	.0533** (.0228)	-.0155 (.0252)
Hazards ²	-.0001** (.00006)	-.0001* (.0001)	-.0001** (.00008)	-.00001 (.00009)
Fiscal health	3.040* (1.317)	3.250* (2.313)	1.738 (1.864)	3.690** (2.135)
Professionalism	.228 (.427)	.327 (.759)	1.061** (.599)	-.301 (.678)
SoVI (2000)	.093 (.098)	.181 (.168)	-.046 (.130)	.092 (.152)
Population density	.003** (.001)	.006** (.003)	.004** (.002)	-.0002 (.002)
Population change (2000-2006)	2.921 (2.437)	7.693** (4.320)	1.585 (3.463)	1.833 (3.819)
Incorporated areas	-.107** (.061)	-.052 (.108)	—	—
Unified government	-.075 (.100)	-.155 (.179)	—	—
Social capital	-.0007* (.0004)	—	-.001*** (.0006)	—
Bordering counties	-.007 (.143)	—	—	.008 (.231)
Constant	8.875*** (1.519)	9.593*** (2.588)	6.070*** (2.015)	10.411*** (2.327)
Adj. R ²	.01	.03	.03	.01
N	631	158	237	236

Note: Above are coefficient estimates and standard errors from ordinary least squares regression models for county-participant dyads. The data are obtained from survey responses of emergency managers in North Carolina counties.

***p-value<.01, **p-value<.05, *p-value<.10 (one-tailed test)

Figure 1: The Effect of Risk on Mobilizing Participants in Performance Regimes



Note: The plotted lines represent 95% confidence intervals around the linear prediction. Figure 1 was created using the `Zelig` (Imai et al. 2008, 2009) and `ls` (Imai et al. 2007) packages in R (R Development Core Team 2009).

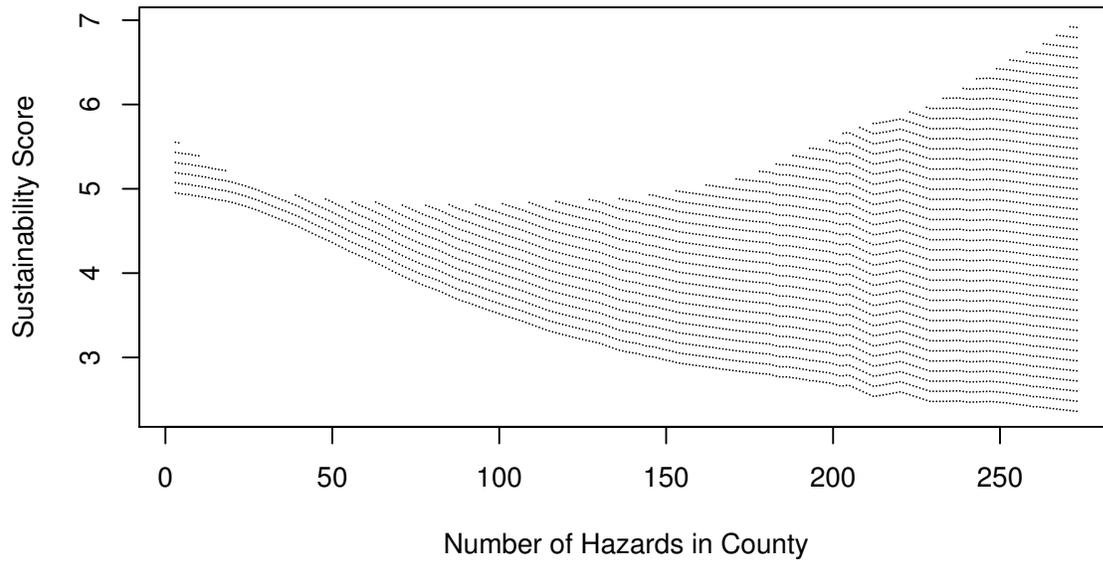
Table 5: Sustaining participation in local performance regimes, by giving responsibility in developing new ideas to various participants.

Independent variables	Participants/Actors			
	Full Model	Governmental	Non-Governmental	Outside County
Hazards	-.017*** (.006)	.003 (.011)	-.014** (.008)	-.016* (.011)
Hazards ²	.00005*** (.00002)	.00005* (.00004)	.00005** (.00003)	.00003 (.00004)
Fiscal health	-1.992*** (.500)	-2.612*** (.936)	-2.175*** (.698)	-.914 (.947)
Professionalism	-.525*** (.161)	-.368 (.305)	-.552*** (.225)	-.669** (.299)
SoVI (2000)	.021 (.037)	-.034 (.067)	.035 (.048)	.068 (.067)
Population density	-.0001 (.0007)	-.001 (.001)	.00007 (.001)	.002** (.001)
Population change (2000-2006)	-2.458*** (.923)	-2.368* (1.756)	-2.115* (1.295)	-2.361* (1.685)
Incorporated areas	.009 (.023)	-.008 (.043)	—	—
Unified government	.052* (.038)	.106* (.072)	—	—
Social capital	.0004*** (.0001)	—	.0002 (.0002)	—
Bordering counties	.076* (.054)	—	—	.140* (.101)
Mobilization	.378*** (.015)	.386*** (.033)	.393*** (.024)	.366*** (.029)
Constant	2.495*** (.590)	2.790*** (1.088)	3.243*** (.768)	1.503 (1.070)
Adj. R ²	.49	.46	.52	.41
N	631	158	237	236

Note: Above are coefficient estimates and standard errors from ordinary least squares regression models for county-participant dyads. The data are obtained from survey responses of emergency managers in North Carolina counties.

***p-value<.01, **p-value<.05, *p-value<.10 (one-tailed test)

Figure 2: The Effect of Risk on Sustaining Participation in Performance Regimes



Note: The plotted lines represent 95% confidence intervals around the linear prediction. Figure 2 was created using the `Zelig` (Imai et al. 2008, 2009) and `ls` (Imai et al. 2007) packages in R (R Development Core Team 2009).

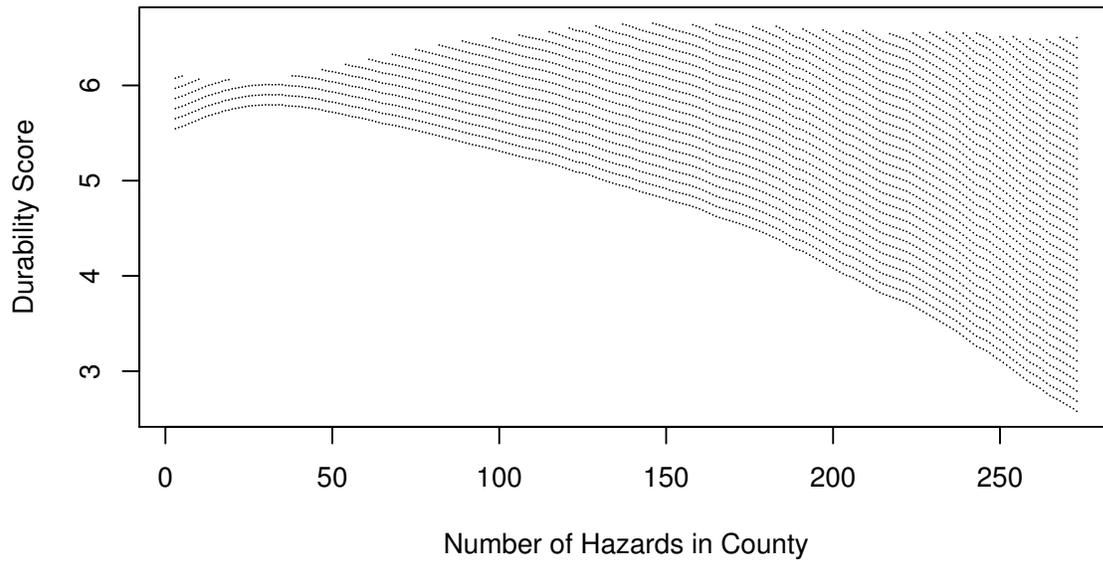
Table 6: Creating durable performance regimes, by developing consistent management practices with various participants.

Independent variables	Participants/Actors			
	Full Model	Governmental	Non-Governmental	Outside County
Hazards	.004 (.005)	.012 (.009)	.008 (.008)	-.005 (.009)
Hazards ²	-.00003* (.00002)	-.00008** (.00003)	-.00004* (.00003)	.000005 (.00003)
Fiscal health	-.730** (.440)	-.098 (.782)	.683 (.707)	-2.245*** (.793)
Professionalism	.292** (.141)	.243 (.250)	.346* (.226)	.113 (.246)
SoVI (2000)	.086*** (.032)	.013 (.055)	.081** (.048)	-.002 (.054)
Population density	.003*** (.0006)	.001** (.001)	.001* (.001)	.001** (.0009)
Population change (2000-2006)	-1.286** (.802)	-.872 (1.438)	-.673 (1.291)	-1.045 (1.379)
Incorporated areas	.025 (.020)	.012 (.035)	—	—
Unified government	-.196*** (.033)	-.159*** (.059)	—	—
Social capital	-.0005*** (.0001)	—	-.0003 (.0002)	—
Bordering counties	.101** (.047)	—	—	.054 (.083)
Mobilization	.277*** (.018)	.332*** (.037)	.198*** (.035)	.272*** (.031)
Sustainability	.337*** (.034)	.216*** (.067)	.462*** (.065)	.311*** (.055)
Constant	1.416** (.520)	.711 (.905)	-.151 (.791)	3.332*** (.898)
Adj. R ²	.64	.64	.56	.56
N	631	158	237	236

Note: Above are coefficient estimates and standard errors from ordinary least squares regression models for county-participant dyads. The data are obtained from survey responses of emergency managers in North Carolina counties.

*** p-value < .01, ** p-value < .05, * p-value < .10 (one-tailed test)

Figure 3: The Effect of Risk on Creating Durable Performance Regimes



Note: The plotted lines represent 95% confidence intervals around the linear prediction. Figure 3 was created using the `Zelig` (Imai et al. 2008, 2009) and `ls` (Imai et al. 2007) packages in R (R Development Core Team 2009).