

**Natural Disasters as Focusing Events:  
Policy Communities and Political Response\***

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*This article explains how large hurricanes and earthquakes influence Congressional agenda activity. By understanding these events as focusing events, we can better appreciate how they induce the news media and Congress to be more attentive to these disasters. While the theory of focusing events outlined here is broadly supported, considerable differences are found between the hurricane and earthquake fields. These differences turn on the political environment in which federal policy to address these disasters is made, and include the nature of the committees charged with policy making, the nature of testimony offered before the committees, and the nature of the professional communities that are most active in this policy making. These differences help to explain why there is greater federal involvement in earthquake policy making than in hurricane policy. The policy implications of these differences are considered.*

Natural disasters are among the most dramatic events depicted by the news media, and when they are large enough draw attention from the public and policy makers at the national level (Smith 1992). As dramatic and damaging as large natural disasters are, disasters are low priority public problems until the moment they strike (Rossi et al. 1981; May 1985; Stallings 1995). After disasters, public and policy makers' interest in disaster preparation, mitigation and relief rapidly but briefly increases, driven either by their need to respond or by dramatic news media accounts of disasters in neighboring states or communities. The interest in disasters and possible responses to disaster then fades rather quickly. The next disaster rekindles interest, and the cycle repeats.

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These responses seem intuitive, but social scientists have yet to effectively analyze what it is about natural disasters that generates increased governmental attention to these problems. I argue that we can better understand these disasters by thinking of them as *focusing events* (Kingdon 1995). This article examines attributes of two types of disasters—earthquakes and hurricanes—to explain what makes such events “focal.” Improved knowledge of when and why government responds to disasters is particularly useful to those who wish to translate natural disasters into the impetus for policy to mitigate damage from future disasters.

To understand the extent to which earthquakes and hurricanes influence policy making, I measure their influence on the congressional earthquake and hurricane agendas. The first part of this analysis is a review of the political context of disaster policy making. The next part is an empirical analysis of agenda dynamics in these two types of disasters, which reveals important differences in the influence of earthquakes and hurricanes on the agenda. I discuss these differences in detail, and consider how the composition of the policy community influences the agenda dynamics of a policy area. I conclude by discussing the implications of my findings for disaster policy making.

Beyond examining general agenda setting effects of disasters, I show that the nature of these two professional communities leads to remarkably different levels of governmental attention to disasters. In the earthquake field there is a national community of scientific and technical experts and available to provide needed expertise to national and local government. On the other hand, there is considerably less scientific expertise available at the national level to deal with hurricanes. Thus, as I show in this article, the earthquake problem remains on the federal government's agenda, albeit at a low level, between events. On the other hand, federal policy making between hurricanes is less active than it is between earthquakes.

### The Policy and Political Context of Natural Disasters

Federal governmental efforts to alleviate suffering in the wake of disasters traditionally concentrate on disaster relief (May 1985). The Disaster Relief Act of 1950 (PL 81-875) replaced ad hoc, event-specific aid packages with general disaster relief law. Subsequent legislation has often been event-specific and, as typifies distributive policy (Ripley and Franklin 1984), characterized by mutual accommodation of different regions' needs. May (1985, p. 21) notes that such accommodation was based on the need to deal with potential future disasters and on the need to provide aid to areas where disasters had not originally triggered federal relief measures. New

relief measures therefore often included retroactive aid provisions to gain wider support of aid bills.

Before the National Earthquake Hazards Reduction Act (NEHRA) of 1977, no unified federal policy existed to encourage research on and encourage the implementation of ways to reduce earthquake losses. Except for the mitigation oriented elements of the National Flood Insurance Program (NFIP), and the relatively few development restrictions encouraged by the Coastal Barrier Resources Act of 1982, there is little mitigation oriented federal policy concerning hurricanes per se. The National Flood Insurance Program (NFIP) contains important flood mitigation requirements as conditions of eligibility for insurance. This is important to residents of hurricane areas, as flooding from the storm surge and from heavy rains contributes to storm damage, but the NFIP is not a hurricane mitigation program per se. The lack of federal hurricane mitigation policy can be attributed to low salience of the hurricane problem compared with other governmental problems (Rossi et al. 1981; May 1985, p. 8). After a disaster, local officials and residents are most concerned with being quickly granted relief rather than dealing with prospective events. After relief has been widely distributed, interest in disasters subsides, returning to its prior status as the province of public safety and disaster relief experts. The federal government is under considerable pressure from local interests to speed relief to disaster victims. It is under comparatively little pressure to provide support or encouragement for predisaster mitigation measures, particularly when such measures would run counter to local development goals.

Mitigation policy is difficult to promote because there are few groups or “publics” that organize to press for federal or local mitigation policy (May 1990; Stallings 1995). A hallmark of “policies without publics” is “the limited development of interest groups, usually restricted to scientific and technical communities” (May 1990, p. 190). The nature and composition of natural disaster policy communities may change for a short period immediately after an event. Victims enter and exit the community to demand disaster relief, but over the long run the composition of disaster policy communities does not change significantly, and the problem returns to its previous low-salience status. However, as shown below, there is considerably greater evidence of this professional mobilization, in federal policy making, in the earthquake domain, and relatively less such mobilization in the hurricane field. At the local level, there is often considerable local resistance to costly land use planning and building code measures to prevent harm from a generally unpredictable hazard (May and Birkland

1994). As a result, there is no obvious constituency for policy entrepreneurs to draw upon to advance disaster prevention and mitigation programs.

In summary, disaster policy is the province of technical experts or legislative specialists when the problem is less salient. When a disaster makes disaster policy more salient, the focus is on deficiencies in the delivery of relief, and relief agencies in the federal government assume a defensive role after a disaster. The result is pressure for policy that deals retrospectively with the shortcomings of disaster relief, while rarely if ever dealing prospectively with future disasters. If generals are said to be ready to fight the last war, disaster policy seems to be geared to respond to the last disaster.

### Theory and Analysis

With the low salience of natural disasters in mind, the first step in this analysis is an understanding of the features of large natural disasters that lead to policy makers paying greater attention to disasters. Attention is measured by examining activity on the federal institutional agenda that concerns earthquakes. The institutional agenda is "that list of items explicitly up for the active and serious consideration of authoritative decision makers" (Cobb and Elder 1983, pp. 85-86). The institutional agenda will grow or shrink depending on the demands placed on a government body to deal with a problem. Since in this study, the institutional agenda is measured using data on the United States Congress, for the sake of clarity I call this subset of the institutional agenda the congressional agenda.

The following models test two complementary sets of hypotheses about the power of earthquakes and hurricanes to influence congressional and news attention. The first set of hypotheses deals with attributes of the event itself. Disasters that do the greatest property damage, kill the most people, are most rare, and affect the largest numbers of people are hypothesized to have the greatest influence on the congressional or news agendas. In the models, the news agenda is compared to the congressional agenda to illustrate differences in governmental versus journalistic responses to natural disasters. It is also worthwhile to understand news media response to disasters, since this coverage is an important influence on congressional attention to the disaster problem.

The second set of hypotheses relate to what I call the political attributes of earthquakes and hurricanes. I posit that the greater the news coverage, the mobilization of groups pressing for policy change, the expressed attitudes in favor of policy change, and the number of people affected by a

disaster, the greater the pressure placed on Congress to do something about the problem. This pressure is reflected by congressional agenda activity.

In the models that follow, individual earthquakes and hurricanes are the units of analysis. These disasters were the largest earthquakes and hurricanes in the United States from 1960 to 1990, as determined by the United States Geological Survey and the National Hurricane Center. The dependent variables of interest are measures of news and congressional "agenda activity." The term "activity" is preferred to "change" because this variable considers more than simply agenda change. Agenda activity is the rate of agenda change times the agenda density of an event. Agenda change is measured by counting the absolute numbers of bills introduced and testimony delivered to congressional committees in the two year periods before and after the disasters, and calculating the rate of change. The rate of news change is similarly constructed by counting articles in the *New York Times Index* under the keywords "earthquakes" and "hurricanes."

Agenda density measures the extent to which a particular event dominates the agenda. Congressional agenda activity is computed by dividing the number of witnesses that testified about a particular event in the two-year period after the event by the total number of witnesses discussing all domestic earthquakes and hurricanes in the same period. The news activity variable is similarly constructed. The density variable serves as a discount factor, so that events that simply coincide with agenda change do not carry the same weight as events that are more directly related to agenda change. The most important events, of course, are those that dominate the agenda and lead to a great deal of agenda change. The density variable is particularly important in the hurricane field, where storms tend to group together during the hurricane season, making it difficult to isolate a particular storm's effect on the agenda.

Table 1 shows the correlations between event attributes and the Congressional and news agendas. (The sources of data and any transformations for the independent variables are contained in table 4.) Since at this point I am most concerned with the bivariate relationships between the dependent variable and the independent variable, zero-order correlation coefficients are computed. This allows for comparisons of the sign and magnitude of the variables, while the adjusted  $R^2$  of the regression model is provided to assess the overall variance explained by the variables taken together.

News and congressional activity are highly correlated with the degree of deaths and damage in earthquakes while "

is—are relatively more important in the hurricane field than with earthquakes. Indeed, deaths and damage are much less important in hurricane news than in earthquake news. Deaths and damage are highly correlated with congressional activity on hurricanes, but the rarity and scope of hurricanes are more important than these attributes of hurricanes. These differences can be attributed to the nature of the damage done by these disasters. In an earthquake, damage tends to be concentrated in a fairly compact geographic area and is often dramatic and graphic, and is therefore easier to depict in the news. Hurricane damage, on the other hand, tends to be widely dispersed across a broad geographic area and, unless the storm is of unusually great magnitude, the damage tends to be less graphic than in earthquakes. Wind and wave damage usually consists of broken windows, flooding, and downed trees and utility lines. This sort of damage is usually expected, is often far less than originally feared, and is considered by journalists as routine for these events, which are then covered using familiar news formulas.

We might expect that these differences in news and congressional responses to earthquakes and hurricanes would have an influence on political mobilization. After all, if Congress' attention can only be attracted by a few exceptional hurricanes, it is difficult for a community to grow to deal

**Table 1. Event Attribute Models**

Dependent Variables	Correlation Coefficients			
	News Agenda Activity		Congressional Agenda Activity	
	Earthquakes	Hurricanes	Earthquakes	Hurricanes
Damage	0.829	0.304	0.916	0.736
Deaths	0.723	0.154	0.912	0.700
Rarity	0.426	0.477	0.351	0.582
Scope	0.281	0.406	0.123	0.283
N	38	25	38	25
Regression results <sup>a</sup>				
Adjusted R <sup>2</sup>	0.670	0.277	0.876	0.812
F	27.163	4.058	87.915	35.565
p	0.000	0.020	0.000	0.000

<sup>a</sup>Dependent variables are news and institutional activity, respectively. Regression model uses interaction term between damage and deaths. Variables are transformed to meet the requirements of OLS regression.

with these issues. On the other hand, congress is attentive to the damage done by an earthquake, regardless of its rarity or breadth of effects. This means the earthquake policy community can use these events as evidence of the need for improved government response. This is reflected in the regression models of the political attributes of earthquakes and hurricanes, table 2. In these models, congressional agenda activity is the dependent variable. Change in the amount of news coverage of an event and the density of that coverage are both important determinants of congressional agenda activity on earthquakes. In the hurricane field, news density is important but news change is not. This is due in part to the bunching effect of hurricanes that makes the influence of one particular event on the agenda difficult to discern when there are several events on the agenda at roughly the same time. Earthquakes are less likely to bunch together, agenda activity is easier to relate to particular events, and news change and news density are weakly correlated ( $r = 0.169$ ). The two variables are negatively correlated in the hurricane data ( $r = -0.437$ ). Whether one focuses on the absolute change in news coverage, or the extent to which the news is dominated by an event, the findings confirm others' conclusions that, for many decision makers, the news media are a critical source of information on sudden-onset events (Smith 1992). In the hurricane field, this is particularly true. News coverage of hurricanes, which is itself driven by the novelty or exceptionality of the hurricane, is a more important influence on congressional attention to hurricanes than it is in the earthquake field. This puts those who would press for federal policy on hurricanes at a considerable disadvantage. It suggests that, among other things, they must wait for the truly exceptional event to attract congressional attention, rather than being able to simply use any damaging event as an exemplar of the need for federal attention. This may inhibit the formation of an ongoing professional community that deals with hurricanes, as discussed below.

In both the hurricane and earthquake fields, agenda activity is a function of the mobilization of people who are dissatisfied with existing federal policy on these disasters. But this mobilization does not suggest content of the testimony, nor does it consider its intensity. Thus, the extent to which current policy toward a hazard is supported or criticized by the witnesses dealing with events—as measured by the tone variable—is important in the earthquake model, but not in the hurricane model. The reason for this is not immediately clear in the regression, but is evident in a closer look at the testimony delivered at congressional hearings. In the earthquake hearings there is greater variation overall in witnesses' attitudes toward current policy than the hurricane testimony. In earthquakes, disaster relief domi-

**Table 2. Political Model of the Congressional Agenda**

Dependent Variable	Congressional Agenda Activity	
	Earthquakes	Hurricanes
New Change	0.451**	-0.032
New Density	0.372**	0.696**
Mobilization	0.307**	0.357*
Scope	0.028	-0.091
Tone	-0.380**	0.109
N	38	25
Adjusted R <sup>2</sup>	0.633	0.371
F	13.746	3.836
p	0.000	0.014

\*p&lt;.05

\*\*p&lt;.01

nates event-specific testimony, while testimony offered without reference to particular earthquakes concentrates on general scientific and technical issues. In the hurricane field there is no difference between testimony delivered in response to a storm and more generic testimony. In both instances, testimony about hurricanes is predominantly about disaster relief, and is broadly critical of federal relief policy or practice. In the earthquake field, an event leads to more critical analysis compared with testimony that is unrelated to an event. This criticism leads to greater congressional agenda activity as policy makers seek to understand and possibly correct problems in existing policy.

In both fields, political conflict over policy, as measured by the mobilization variable, plays an important role in congressional agenda activity. This suggests that events mobilize pro-change witnesses and that their activity is an important determinant of congressional agenda activity. Again, the story is rather more subtle than the data suggest. When congressional representatives and disaster victims hold and attend hearings on disasters, their comments are likely to be critical of disaster relief policy. They are much less likely to deal meaningfully with mitigation policy. The hearings reviewed here reflect May's finding that "typically, [disaster] hearings consisted of various local officials' berating governmental relief efforts for the disaster that was being investigated, along with demands for new relief provisions as part of the general disaster relief act" (May 1985, p. 26). In the immediate aftermath of large disasters, there is a great deal

more negative commentary about disaster relief from citizens and local government officials than there is between events, where disaster mitigation policy is a "policy without a public" and interest is low. However, there are important differences between testimony offered by earthquake professionals and that offered by members of the relatively small national hurricane community. These differences are reflected in the nature of the post-event mobilization of these two communities. These differences can be attributed to the starkly different national policy communities that deal with earthquakes and hurricanes.

### Professional Mobilization After Natural Disasters

The differences between news coverage and governmental response to earthquakes and hurricanes can be explained by reviewing recent research on natural disasters, risk, and the response of institutions to unexpected events. Differences in the perception of earthquake and hurricane risks influence the extent to which a professional community will develop, if at all, to deal with a hazard.

Psychological research on risk shows "that people do not define risk solely as the expected number of deaths or injuries per unit time. [P]eople also rank risks based on how well the process in question is understood, how equitably the danger is distributed, how well individuals can control their exposure, and whether risk is assumed voluntarily" (Morgan 1993, p. 35). Experimental psychologists Baruch Fischhoff, Paul Slovic and Sarah Lichtenstein categorize risk factors in three groups. "The first is basically an event's degree of dreadfulness (as determined by such features as the scale of its effects and the degree to which it affects 'innocent' bystanders). The second is a measure of how well the risk is understood, and the third is the number of people exposed" (Morgan 1993, p. 35). In their analysis, "risks carrying a high level of 'dread,' provoke more calls for government intervention than do some more workaday risks that actually cause more deaths than injuries" (Morgan 1993, p. 35). This research can be used to explain the differences between earthquakes and hurricanes. The degree of dreadfulness and the extent to which the risk is understood are the most important issues here.

Both earthquakes and hurricanes are "dreadful" because, when they strike in populated areas, they affect many people at once, most of which are viewed as "innocent" bystanders who suffer through no fault of their own. Earthquakes are more dreadful than hurricanes because less is known about earthquakes than about hurricanes. The physical action and seasonal nature of damaging coastal storms have been well known in the United

States for years, and hurricane tracking and prediction have improved considerably since the 1940s. The disastrous 1938 hurricane that devastated Long Island and New England killed 600 people, largely because hurricane forecasting was primitive, communications between communities in the path of the storm were knocked out so that early warning was more difficult, and because the human and institutional adjustments to such storms were still underdeveloped. Hurricane Camille (1969), the deadliest storm in this study, killed 296 people, a considerable improvement over the 1938 experience. Hurricane Hugo, a very powerful category 3 storm, killed 60 people, while doing more property damage than any hurricane since Camille. The historical trend in the United States is toward fewer fatalities, even as property damage increases.

Earthquakes are also becoming more damaging, but are also killing fewer people relative to property damage because of improvements in building codes, better knowledge of land use practices, and a more disaster-aware public in earthquake-prone areas, particularly in California. Still, the knowledge deficit is greater in earthquake mitigation than in hurricane mitigation. Earthquakes sometimes behave rather differently than expected, confounding the best efforts of scientists and engineers. The San Fernando earthquake, while only moderately strong in Richter magnitude, caused ground motion in some places that was greater than had ever been recorded in an earthquake. The 1994 Northridge earthquake caused considerable damage to structures built to standards developed in the aftermath of the 1971 San Fernando earthquake; these standards were, at the time, state of the art (Housner 1994).

There is also less knowledge of where and when earthquakes will strike compared with hurricanes. Residents of the Gulf and Atlantic coasts know that they are under a hurricane hazard; the risk is greatest in the eastern Gulf and southeastern Atlantic coasts, and during a particular season. The earthquake threat is less specific. Along with the well-known earthquake-prone areas (such as California and Alaska) the Midwest, the Charleston, South Carolina area, and the Boston area are also subject to the threat. Unlike hurricanes, which can be anticipated during hurricane season, there is no earthquake season; they can strike any time. When they do strike, they sometimes are the result of movement on an undiscovered fault, as when the Northridge earthquake struck on a blind-thrust fault (Housner 1994, p. 13). Finally, while hurricanes provide some lead time to prepare for the storm, earthquakes provide no such lead time, thereby making them even more frightening. The lead time before a hurricane gives people the sense that they can "do something" to protect themselves in the hours before the

storm hits, even if they have been lax in their preparations before the disaster. Earthquakes, on the other hand, are a persistent threat, but provide no time to prepare if one's preparations are wanting, reducing people's sense of efficacy and making the potential disaster more frightening.

Finally, the dread associated with hurricanes may be mitigated by the fact that people choose to live in hurricane prone areas due to the amenity value of living on the coastline or due to their need to live near the coast to ply their trade. This element of choice allows some people to rationalize the risk of disaster compared to the value of living in a hazard prone area. This helps to account for the considerable resistance to improved land use planning to restrict development in hurricane prone areas. At the same time, this element of choice reduces the sense of dread. By contrast, many people who live in earthquake areas derive little benefit from living in a hazardous area per se. Rather, earthquake effects can be seen in broad areas, regardless of the amenity or other value of the land, thereby making people feel less able to effectively prepare for the threat.

None of this is to suggest that hurricanes are less dangerous than earthquakes. Rather, this suggests that common risk calculations make earthquakes somewhat more dreadful and thus more newsworthy than equally destructive hurricanes. The result is that journalists writing about hurricanes use another hook for their stories besides deaths and damage per se. Two of these hooks are the novelty of the event and the scope of the event. Furthermore, since dread is in part a function of knowledge of the mechanics of natural disasters, one might suppose that greater effort would be devoted to learning more about the most dreadful hazards. In this case, the more dreadful hazard is earthquakes.

The hearing record supports this hypothesis. The less visible federal scientific community that specializes in hurricanes is relatively small and concentrates primarily on weather forecasting. The earthquake community is larger, and is centered on earth science and hazard reduction through improved engineering and technical knowledge. The disproportionate attention paid to weather forecasting reflects the lack of pressure at the federal level to learn more about potential technical responses to hurricane mitigation. There appears to be a perception in Congress that earthquakes need more scientific attention than hurricanes, as reflected by the establishment of the National Earthquake Hazards Reduction Program. There is no parallel program to deal with hurricanes, and therefore no federally subsidized group of researchers that can work to institutionalize this problem on the congressional agenda. It may also reflect local opposition to a course that, if followed, would result in pressure from the scientific community to

change local land use and building practices in coastal areas. In short, many factors work against the development of a national hurricane policy community, while these factors are not as important in the earthquake field.

Apart from the nature of the hearing record, there are three other features of earthquake and hurricane policy making that reveal differences in the emphasis in science and technology in these fields. The first feature is the nature of the committees that hear the most testimony in the policy community. A community in which testimony is delivered most often to science-oriented committees is substantially different from a community in which most testimony is delivered to committees concerned with public works. The second feature is the types of groups that appear most often before congressional committees. Finally, the manner in which policy entrepreneurs are important in each field reveals how policy entrepreneurship is important in a field and the primary concerns on policy entrepreneurs' agendas.

### The Congressional Committee Environment

Senate and House public works committees dominate the hurricane issue, hearing 63.8 percent of the testimony delivered on hurricanes between 1960 and 1990. By contrast, the two most active earthquake committees, the House Science, Space and Technology and Senate Commerce, Science and Transportation committees, heard 38.6 percent of the testimony heard in this field. These patterns reflect the near-exclusive orientation toward disaster relief in the hurricane field and the mixed hazard reduction and disaster relief agendas in the earthquake field. The differences turn on the kinds of committees that hear testimony on these issues.

Public works committees have historically been constituent- and project-oriented bodies that seek to serve members' local political goals by delivering federal largesse to the home district (Ripley and Franklin 1984; Smith and Deering 1984; Davidson and Oleszek 1994). Hurricane policy is made in an environment characterized by mutual accommodation, logrolling, locally inspired projects, and close knit, distributive policy relationships between the bureaucracy (the Army Corps of Engineers) and the committee. In this environment it is unlikely that a policy entrepreneur would be able to substantially change the way this business is transacted. Reinforcing this policy making is the Army Corps of Engineers' project-oriented culture and the belief that engineered solutions are often the best ways to mitigate flood, storm surge and erosion damage from hurricanes. Dams, flood control projects, storm gates, breakwaters and groins are also broadly popular in the local community, because they protect local beaches against routine beach erosion, and because of the local economic benefits of large const-

tion projects, regardless of their *long-term* efficacy either in protecting from normal erosion or flooding or more serious damage by hurricanes. More effective ways of protecting lives and property exist, such as strictly limiting development on barrier islands or low lying coastal areas. These solutions conflict with local development goals. Tourism and fishing, for example, are directly dependent on a coastal location, and cannot be readily moved to safer areas, while many people enjoy seaside living and are willing to assume the relatively small risk of a hurricane striking a particular place.

In disaster policy making, scientific information in the post-event phase is less important in decision making because the immediate focus is on disaster relief and reconstruction. This is much more pronounced in the hurricane field. Members of the public works committees are relatively uninterested in scientific discussions of the hurricane hazard. There are several reasons for this. First, such knowledge does not help to advance member goals, which concentrate on bringing home projects or ensuring the flow of disaster aid. Second, scientific knowledge of the major elements of the hazard—location and building practices—is already largely settled, and is therefore an implementation problem. Third, the implementation of such knowledge conflict with local land use and development preferences. This makes for a less than fertile arena for policy entrepreneurs.

The earthquake field is considerably different. The two most active committees in this field are more science-oriented than the key hurricane committees. While there is a considerable constituency service element that motivates members of "scientific" committees, many members with broader policy interests have joined the committees in recent years. Such members express interests in science and technology that go beyond individual district interests to encompass broader national policy issues (Smith and Deering 1984). They are more likely to solicit expert opinion to better understand the state of the art in earthquake science and engineering, and are more likely to promote programs to implement this new knowledge. This willingness to gather and consider information may also be a function of the relatively low level of knowledge of earthquake dynamics, and Congress' perception that it has a role to play in advancing that knowledge.

In summary, the committees that take the greatest interest in hurricanes are constituency service committees that are most concerned with delivering federal largesse. Earthquake policy making is more open, and is characterized by a desire to seek out and apply knowledge gained in disasters to mitigate future harms. If this characterization is true, it should be possible to identify groups that appear before Congress who work to advance

programs to gather, analyze and disseminate scientific information on earthquakes. Fewer such groups should be evident in the hurricane field.

The historical record supports this analysis. Beginning with the National Academy of Science's extensive reports on the 1964 Alaska earthquake, the scientific community, supported by the federal government, has worked to gather and disseminate improved scientific information on earthquakes. The Earthquake Engineering Research Institute (EERI), a professional organization of scientists, engineers, social scientists, and others professions, has supported a great deal of this professional activity. In addition, Senator Cranston of California was an important proponent of national policy making on earthquakes. He sponsored more bills dealing with earthquakes (seven) than any member of Congress in the period of this study, and was key to the passage of the National Earthquake Hazards Reduction Act (NEHRA). There are no comparable efforts in the hurricane field in any sense: there is no hurricane-related group parallel to EERI, there is no unified federal program to study the hazard, and there is little or no demand for Congress to create such a program.

#### Group Participation and the Nature of Testimony

Congressional testimony on earthquakes is dominated by scientific and technical experts. Officials of the legislative and executive branch, whose concerns run mostly toward disaster relief, deliver more testimony on hurricanes. The dominant scientific groups represented in the hurricane field are those charged with weather forecasting. If we *very* broadly define the scientific community to encompass the Weather Service and the Corps of Engineers (the Public and Civil Works categories) the scientific community contributes a bare 8.5 percent of testimony delivered in the hurricane policy community. Scientific testimony in the earthquake community accounts for 35 percent of the testimony in the field, roughly four times more scientific activity in the earthquake community than in the hurricane community.

These patterns reflect the greater attention paid to scientific and technical issues in the earthquake field, as well as the greater degree of mobilization and organization of the scientists that deal with this type of disaster. The importance of scientific and technical expertise in the earthquake community, and the paucity of such expertise in the hurricane community, is further illustrated by the types of policy entrepreneurs that appear before congressional committees. I define a policy entrepreneur in the earthquake or hurricane fields as a witness who testified two or more times before congressional committees in the study period. Even with this potentially overbroad definition, there are very few witnesses that can be called

hurricane policy entrepreneurs compared with the earthquake community. Of the individuals identified as hurricane policy entrepreneurs, only the representatives of the National Hurricane Center have consistently provided scientific information to committees and have consistently related their knowledge to ways in which hazards could be reduced. By contrast, scientific and technical information was much more likely to be offered in the earthquake community, from the United States Geological Survey (USGS), the National Institutes of Standards and Technology (NIST) and its predecessor, and from seismologists, geologists, and engineers in the public, private, and academic sectors. An important nonscientist, Senator Cranston, was a crucial policy entrepreneur in this field and an important supporter of the 1977 National Earthquake Hazards Reduction Act.

Combining knowledge of who participates, where they participate, and what they say completes the picture of these policy communities. There is a more active professional community in the earthquake field than in the hurricane field. Both the earthquake and hurricane agendas are quite sensitive to events, and, when such an event is high on the agenda, disaster relief is the highest item on the agenda. But the earthquake community contains more active policy entrepreneurs that keep issues of seismic safety and hazard mitigation on the agenda between large events. Between-event discussion of hurricanes is, by contrast, at about the same level as event-triggered discussion, suggesting that ongoing policy making activity in this field is less important than in earthquakes.

#### Decision Maker and Policy Entrepreneur Response to Disasters

These differences in interevent activity between earthquakes and hurricanes are reflected in table 3. The larger, more active earthquake policy community means policy entrepreneurs and decision makers in the community are more likely to testify without reference to particular disasters. Hurricane decision makers and policy entrepreneurs are almost as likely to testify about particular hurricanes as they are to discuss the problem in general.

In both fields, there is also evidence of a policy monopoly (Baumgartner and Jones 1993). A policy monopoly defends current policies and positions against attacks from opponents who are dissatisfied with current policy. Policy monopolies also work toward and support policy change, but on their terms; they generally tend to oppose hasty action in the immediate wake of a focusing event.

In the earthquake and hurricane communities, the policy monopoly, largely dominated by emergency management and disaster relief specialists, must defend itself in the wake of criticism triggered by the event. In



**Table 3. Decision Maker and Policy Entrepreneur Activity**

Testimony	Hurricanes			
	Decision Makers <sup>a</sup>		Policy Entrepreneurs <sup>b</sup>	
	Centered on Event	Not Centered	Centered	Not Centered
N of witnesses	96	101	59	56
Mean tone <sup>c</sup>	0.073	-0.119	-0.322	-0.375
t		1.330		0.347
p (one tailed)		0.093		0.365

  

Testimony	Earthquakes			
	Decision Makers		Policy Entrepreneurs	
	Centered on Event	Not Centered	Centered	Not Centered
N of witnesses	72	129	61	141
Mean tone	0.222	0.163	-0.131	0.050
t		0.492		-1.111
p (one tailed)		0.312		0.134

<sup>a</sup>Decision makers are witnesses in a policy making role in the federal legislative or executive branch.

<sup>b</sup>Policy entrepreneurs are witnesses who appeared two or more times in hearings in their respective fields.

<sup>c</sup>Tone is attitude toward current policy, where -1 indicates dissatisfaction with current policy, and +1 indicates satisfaction with policy.

table 3, in all but one instance the difference in tone (attitude toward current policy) between event-centered and more generic testimony is not statistically significant at the .10 level, so these results are merely suggestive of trends that may emerge in more extensive research. In the hurricane field, decision makers are likely to be more negative when an event is not on the current agenda, while they are more supportive, on average, of existing policy in the wake of a particular event. This appears to be due to a closing of ranks among officials at agencies such as the Federal Emergency Management Agency (FEMA) and state emergency response organizations—the policy monopoly—in the face of criticism from local government and disaster victims. When an event is not on the agenda, these officials explore improvements to existing policy without reference to a particular storm, resulting in a slightly more negative tone. Decision makers' activity also reflects their preference to make policy well after an event

has diminished in agenda status, thereby avoiding precipitate policy making in the immediate aftermath of a disaster. Policy entrepreneurs, on the other hand, are motivated by a desire to change policy, and their attitudes are unchanging in the hurricane field, because they are invariably concerned with revealing and remedying the faults of disaster relief policy.

The behavior of decision makers in the earthquake field parallels the hurricane domain, for the same reasons. While the differences are not statistically significant, it appears that policy entrepreneurs' testimony in the wake of earthquakes is slightly more negative on average than more generic testimony. This buttresses a recurrent theme in this study: that the existence of an effective earthquake policy community means that the community can take advantage of events to elevate the earthquake issue on the agenda without resorting to merely criticizing disaster relief policy. Decision makers, on the other hand, wait until the disaster has diminished in importance before supporting policy change. Again, it must be stressed that the data is only suggestive on this point, and that further research over a longer period may reveal more conclusive patterns. That decision makers as well as policy entrepreneurs work to achieve post-event policy change suggests strongly that agenda setting in the earthquake field is characterized by internal mobilization (Cobb et al. 1976) of governmental professionals, rather than by outside political pressure, either from policy entrepreneurs or broader publics.

In summary, the earthquake field has an active policy community that is active during post event periods but which is more active between such events. The hurricane community is as likely to respond to events as it is to act between them. Discussion of the hurricane problem focuses on relief rather than mitigation no matter whether congressional testimony is centered on a particular event or discusses the problem more generally.

### Analysis: Availability of Policy Tools and the Creation of National Policy Communities

The three features of disaster politics outlined above—the nature of key congressional committees, patterns of group participation and testimony, and the response of decision makers and policy entrepreneurs to disasters—suggest a common theme that differentiates federal hurricane policy from earthquake policy. A federal policy tool to deal with hurricanes has been largely settled upon. That tool—weather forecasting—is at the center of any scientific discussion in this field, either before or after hurricanes, and represents the extent to which science is important at all in federal hurricane policy. As far as mitigating hurricane damage, there is relatively

little more to be done scientifically. Thus, the importance of science in hurricane policy at the federal level is exceedingly small, as scientific testimony never dominates the discussion. This tendency to subordinate scientific tools to a reliance on disaster relief is reflected in the public works orientation of congressional committees, in the absence of mobilization of scientific professionals after hurricanes, and by the dominance of disaster relief experts in post-event discussions among decision makers and a very broadly defined community of policy entrepreneurs.

This is not an indictment of the scientific community or of the political leadership that occasionally deals with hurricanes. Rather, these patterns are probably a reflection of the difficulties of creating federal policy to mitigate hurricane damage, considering that land use tools are likely to be the most useful tools in this field. Land use control is traditionally considered a state or local function, and the federal government is likely to be wary of interfering in such a sensitive function. The sensitivity of land use is exacerbated, by a number of features of land use politics, including the currently controversial issue of governmental "takings" of land through land use restrictions, and the undeniably attractive attributes of building homes, businesses, and public amenities along or near the seashore. In short, political factors may make hurricane mitigation particularly difficult at the federal level, and this task will likely remain the province of the states.

Earthquakes are somewhat less well understood than hurricanes, so the range of tools to deal with earthquakes is larger and not yet exhausted. While land use measures are useful in mitigating earthquake damage (as in restrictions on building in steep slope areas or on dangerous soils) land use is neither the sole nor the most obvious tool for mitigating earthquakes. Indeed, much scientific work on earthquake mitigation is driven by the fact that land use restrictions may be unrealistic, both because of property owners' attachment to their land and because land use restrictions cannot mitigate the damage to *existing* buildings in built-up areas. In addition, there is a consensus that there is considerably more to know about earthquakes, both as a matter of pure and applied science. Each earthquake is unique in our scientific understanding of these events, and professionals are continually learning new lessons that have a direct influence on public policy. Thus, the 1971 San Fernando, the 1989 Loma Prieta, and the 1994 Northridge earthquakes led California and other states to consider the new lessons raised by these events. These lessons do not suggest that only one policy tool be adopted. Rather, many tools for mitigating earthquakes are continually suggested, debated, and implemented.

This scientific orientation is reflected in the patterns revealed in this study. There is a national earthquake policy community that is available to explain to Congress the measures that the federal government can reasonably support to mitigate future harms. This community both created the impetus for the National Earthquake Hazards Reduction Act and was supported by the National Earthquake Hazards Reduction Program (NEHRP) created under that Act. The congressional committees that hear testimony on earthquakes are much more interested in science and technology than the public works committees that dominate discussion of hurricanes. Finally, there is a well developed infrastructure of policy entrepreneurs and decision makers, both inside and outside the federal government, that are available to provide scientific expertise and guidance to Congress. Thus, when earthquakes strike, Congress's immediate reaction, much as in the hurricane domain, is to review disaster relief efforts. But, between events, and after the immediate concern with disaster relief diminishes, the scientific community is available to interpret the event for Congress and suggest tools to mitigate future disasters.

### Conclusion: Implications for Disaster Policy Making

The differences between the earthquake and hurricane fields suggest two implications for disaster policy making. First, one cannot suppose that ostensibly similar types of disasters will have parallel effects on the congressional agenda. In this study, the most important difference between hurricanes and earthquakes is the nature of the policy communities that deal with these disasters. Policy outputs thus differ as well, suggesting that no two policy fields within the broader rubric of "natural disasters" are necessarily alike.

Second, the empirical models reveal differences in the mobilization of political entrepreneurs, policy makers, experts, and ordinary citizens. Policy entrepreneurs are particularly important in natural disaster policy making because there is little other stimulus for change in disaster policy. Cobb, Ross and Ross characterize policies where the impetus for change must come from inside government or professional circles as "internal mobilization" (Cobb et al. 1976). In such policy making, mass publics do not press for policy change. Rather, policy entrepreneurs usually must wait for an opportunity—usually a disaster—to advance disaster policy on the congressional agenda, and to generate public support for the new policy.

Most advocates in disaster policy would welcome increased public participation, particularly in the pre-event period, if for no other reason than to give the public a greater sense of ownership of the policies intended to

protect their lives and property. Such mobilization is unlikely, however, because low probability risks are diffuse and salience is low. In addition the sudden increase in attention on immediate, post-event relief issues means that the policies that elected officials, acting on behalf of or in concert with a public mobilized temporarily and in response to a particular event, advocate in response to an event may not be congruent with what the active, professional members of the community consider to be the most important issues. This is clear in the earthquake field, where the professional community seizes upon a disaster as an object lesson in the need for better mitigation measures, while the public and its representatives tend to press hardest for rapid and generous disaster relief.

Furthermore, the nature and composition of a policy community before or without an event will have a considerable influence on the nature of the post event response. In particular, a field in which a professional establishment exists is likely to see disasters trigger professionals activity to deal with or frame the policy response to a disaster. These professionals can use the disaster as an opportunity to create and explain policy positions and proposals. The existence of a professional community is thus a necessary condition for this response. Kingdon (1995) calls the combination of events and available advocates along with other sociopolitical factors "the fertile soil," in which policy ideas can take root and move up the agenda. This policy environment does not exist in the hurricane field, and, until it does, the prospect for the passage of comprehensive national hurricane damage reduction programs on the federal level is relatively poor. The hurricane community may conclude from this that it is important to create a "hurricane establishment" parallel to the "earthquake establishment" Stallings (1995) describes. Such an "establishment" would provide policy makers who only occasionally visit this issue with sound analysis and consistent messages on what steps should be taken to mitigate the damage wreaked by future storms. Until such a community is formed, it seems clear that hurricane policy will continue to focus on disaster relief. While large hurricanes may trigger more testimony, that testimony will simply continue and intensify the prior debate over the nature and purpose of disaster relief, and is unlikely to deal with mitigation.

The implication for policy makers is that there is a need to channel highly transient public energy and interest in the disaster threat to not just rebuilding the community, but to reconstructing policy so that the next disaster, wherever it occurs, can be more effectively mitigated, thereby reducing disaster relief costs and suffering. The prospects for such a move are much greater in the earthquake field, where an established community of decision

makers and policy entrepreneurs is working to do just this type of public education at the national level. Because of the smaller, less active hurricane policy community, such a national program of hurricane mitigation is less likely. The result is that if hurricane mitigation is to be aggressively pursued, it must be done at the state level. Without a national policy community to press for national efforts to deal with hurricanes, there will be relatively less federal support for these state efforts than in the earthquake field.

**Table 4. Data Sources and Transformations.**

Variable	Defined	Source	Transformation <sup>a</sup>
Impact	Interaction term: Damage times deaths.	—	—
Deaths	Number of people killed in the disaster.	EQ: USGS database of major seismic event; Hurr: Herbert and Case, 1990.	EQ: Square root; Hurr: Cube root.
Congressional agenda change	Index: Rate of change of testimony in earthquake or hurricane field, two years after event compared to two years before, plus rate of change in bill introductions. This sum is then divided by two.	Both fields: Congressional hearing testimony found through CIS CD-ROM (hereinafter Testimony Database); CCH Legislative Index and Library of Congress information system for bills.	None.
Congressional agenda density	Number of witnesses mentioning the current event divided by all testimony for the two years after the disaster (possible range of 0.0 to 1.0).	Testimony database.	Both: Square root.
Institutional and news agenda activity	Agenda change times agenda density (agenda density used as a discount factor).	Testimony database and <i>New York Times Index</i> .	None.
News Change	Change in news coverage of earthquakes or hurricanes two years after event compared with two years before.	<i>New York Times Index</i> .	Both: Square root.
News Density	Extent to which news coverage in field after an event is about the particular event (possible range of 0.0 to 1.0).	<i>New York Times Index</i> .	EQ: Cube root; Hurr: square root.

Variable	Defined	Source	Transformation <sup>a</sup>
Mobilization	Ratio of representatives of groups that generally support policy change to representatives of groups that oppose change.	Testimony database.	None.
Damage	Amount of damage done by event in 1990 dollars.	EQ: USGS database of major seismic events; Hurr: Herbert and Case, 1990.	EQ: Square root; Hurr: Cube root.
Rarity	Span of time since last event of similar magnitude in terms of deaths and damage.	Computed from USGS and Herbert and Case data.	Both: Square root.
Scope	Number of people in areas declared disaster areas.	Federal Register announcement of disaster areas; U.S. Census for population.	EQ: Square root; Hurr: Cube root.
Tone	Extent of support for existing policy or for change in policy. Support for existing policy = +1. Support for change = -1. Neutral = 0. This is mean tone of all participants in two years after event.	Testimony database.	Both: Square root.
Policy type	Predominant topic discussed by the witness in a congressional hearing. Type assigned and terminology cross-checked for consistency with types used in other fields.	Testimony database.	
Group type	The type of group represented by the witness. Group type assigned and terminology cross-checked for consistency with types used in other fields.	Testimony database.	

<sup>a</sup>Transformations as required to meet assumptions of OLS regression.

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