5 Popular Assessments of Hazards and Hazards Policies: The Case of California's Nine Communities

The main emphasis of this volume has been on the decision makers and partisans who influence, initiate, or formulate public policy in the natural-hazards area. Since the members of this elite group constitute the *supply side* of the policy process, this emphasis is entirely justified. But there is, at the same time, a *demand side* to the process that must also be taken into account. The demand side consists of the opinions of the public to whom our elites are ultimately responsible. How does the general public react to the issues we have been considering?

At a very early stage in designing this project, our hope was to survey both elites and the general public in each sample jurisdiction. Budget constraints quickly put an end to this plan, and we went forward with a study focused entirely on elites. It turned out, however, that the elite survey required about 600 fewer cases than we had originally anticipated, and the consequent savings in the data collection budget allowed us to restore, at least partially, the initial design plan: We would generate "matching" data for both elites and the general public, but only for communities in a single state. The presence of a collaborator, Dr. Richard Berk, in Santa Barbara led us to focus on California for this additional research. In late 1977 and early 1978, nine general-population surveys were undertaken. Details on the design of this survey are presented in Chapter 2. In each of the nine California com-

munities who fell into the larger elite sample, a block-quota sample of 100 local residents was drawn and interviewed, according to a schedule that paralleled the one used in the elite survey. For each of these nine California communities, interviews were obtained from about 20-25 influential decision makers *and* from 100 local residents.

Why California? Aside from the purely pragmatic consideration noted above, there were three reasons. First, California is one of very few states in the sample that provided the minimum 9-10 communities necessary for analysis. Second, California's major natural-hazards problems consist of a very common class of disasters, namely floods, and an extremely rare class of disasters, namely earthquakes and related seismic problems (i.e., landslides, slope failures, etc.). Both problems are amenable to risk mitigation through land use management and thus pose interesting public policy questions. A third major California hazard problem, brush and forest fires, was also covered in depth, mainly because such fires were a menace at the time of the survey. Third, in the area of seismic-risk mitigation, especially, California is by far the most advanced and innovative state in the nation. The "seismic safety element" provision of California law requires that the master plan for every local community in the state reflect an awareness of local seismic hazards, a provision that has been politically contentious in several California communities. Californians' views of earthquake risk and how to manage it would be particularly interesting.

The California sample is *not* a probability sample of the adult population of the state and should not be interpreted as such. It represents only the adult population of the nine California communities from which it was drawn. Each of the communities, regardless of size, is represented equally: one-hundred interviews were conducted in each of the nine sites. Thus, there are as many interviews in Shasta County as there are in Los Angeles.

CALIFORNIANS' RATINGS OF HAZARDS SERIOUSNESS

To judge how salient natural hazards issues are to the general public, the interviews called for ratings of eight of the same local problems asked about in the elite interviews. The resulting average seriousness ratings are shown in Table 5.1, along with the average ratings attributed to the same problems by the local elites from the same nine California communities.

The gross patterns shown in the California population data are quite familiar. As among elites, both in California and elsewhere, inflation, crime, and unemployment tend to be seen as very serious community problems; most natural-disaster problems, in contrast, are rated very low (drought is the

TABLE 5.1

Mean Seriousness Ratings of Selected Local Problems by California Residents and Elites

	Residents			Local Elites		
Problem Area	Average Rating[a]	Rank	N	Average Rating[a]	Rank	N
Inflation	7.59	1	(891)	7.14	2	(183)
Drought	7.39	2	(894)	--[b]	--	--
Crime	7.01	3	(887)	6.07	3	(181)
Unemployment	6.83	4	(875)	7.47	1	(183)
Pornography	4.49	5	(863)	3.89	4	(180)
Fires	4.48	6	(889)	3.89	5	(181)
Earthquakes	2.28	7	(892)	2.21	7	(184)
Floods	2.15	8	(886)	2.90	6	(184)

[a] 1 = no problem at all, 10 = most serious problem: Hence high ratings mean high seriousness.

[b] The drought question was not included in the elite survey.

exception, discussed later). Among the residents, flooding is seen as the least serious of all eight problems, with earthquakes a very close seventh. Fires are considered more serious than either earthquakes or floods, perhaps reflecting only that a large portion of California was ablaze during the period in which the survey was being fielded. Among both elites and masses, all three of these hazard problems are seen as *less* serious than pornography, although for fires the margin is slender.

There is a high degree of agreement between ordinary Californians and their local elites, the correlation between the two sets of ratings being $r=+.96$. Essentially the ratings are almost identical, on the average the differences between the two appearing in the last decimal place. This amount of agreement means mainly that both elites and the general population agree that natural hazards are not very pressing to the community.

The California population survey (but not the elite survey) included drought as one of the problems to be rated. This was added because California was suffering from its worst drought of the century at the time. In late 1977, drought ranked second only to inflation in terms of aggregate seriousness. This is far and away the "best" showing of any hazard problem in any of the data considered in this volume and illustrates that under some circum-

stances, at least, natural hazards problems can rise quite high on the agenda of local concerns. One might likewise anticipate that earthquake seriousness would have been much higher if we had taken the survey right after the San Fernando earthquake of 1971. On the other hand, one necessarily doubts whether the high level of concern over drought would have outlasted the drought itself; a reasonable guess is that a readministration of this item in California today would show that the seriousness of the drought problem has plummeted.

The high seriousness attributed to drought in the middle of the worst California drought in the twentieth century illustrates an important point about the nature of natural hazards problems: When they are problems at all, they can be very serious, but they are only rarely problems in the first place. Natural-hazards problems may rank either first or last on the agenda of concern, but seldom in the middle.

The relative seriousness atributed to the four hazards problems varies significantly across the nine communities, for both elite and general-population samples (Table 5.2). Drought is seen as rather more serious in the northern California communities we studied and rather less serious in the two southern communities, Los Angeles and San Diego. This follows the actual pattern of the drought itself. The pattern for fires is also quite predictable: General concern over fire was highest in Los Angeles, which was burning while our survey was in the field. Los Angeles residents and their elites also have the distinction of attributing more seriousness to the earthquake problem than the residents of any other community. Among Los Angeles respondents, in fact, the average seriousness attributed to earthquakes is 5.57; the highest average for any other community is only 2.32. These patterns doubtlessly reflect that, prior to 1977, the most recent California earthquake of any consequence—San Fernando, 1971—had occurred in the Los Angeles metropolitan area. Finally, the seriousness attributed to flooding is highest in Los Angeles, which suffered serious flooding in 1969, and in the three northern communities of Shasta County, Mendocino County, and Stockton, all in the general vicinity of the January, 1974 northern California flood area.

The most striking finding in Table 5.2 is the close correspondence between elite and mass views of the relative seriousness of these hazard problems. Indeed, across 27 possible comparisons (nine cities by three disaster types), the average absolute difference between elite and general average seriousness is only .7 scale points, and there are but three cases where the difference is more than 1 scale point. Thus, elites and masses tend to share the same opinions about the relative seriousness of natural hazard problems, not only in general (as is apparent from the previous table), but also on a city-by-city basis

TABLE 5.2

Comparison of Elite-Mass Hazard Seriousness Ratings Across Nine California Cities

	Drought		Fire		Earthquake		Flood	
Community	Mass	Elite	Mass	Elite	Mass	Elite	Mass	Elite
El Dorado	8.07	---	4.56	4.47	1.29	1.35	1.36	1.24
Los Angeles	6.22	---	6.34	4.17	5.57	5.50	3.33	2.79
Mendocino	7.05	---	3.62	2.92	1.86	1.31	2.52	3.38
Oakland	7.71	---	4.72	4.00	1.96	2.59	1.44	2.23
Sacramento	7.68	---	4.45	4.59	1.62	2.05	1.81	2.73
San Diego	6.33	---	4.55	3.59	2.32	1.68	1.98	2.64
San Mateo	7.66	---	3.11	2.85	2.32	1.86	1.72	2.43
Shasta	7.73	---	4.52	5.05	1.34	1.24	2.66	5.52
Stockton	8.01	---	4.41	2.95	2.30	1.41	2.55	3.05

The 27 mass-elite comparisons can also be summarized by computing a correlation, which yields a value of $r = +.76$, indicating a very high level of correspondence between elite and mass assessments of hazard seriousness. In communities where the general population sees a particular hazard as relatively serious, so do members of the community elite.

Table 5.3 presents zero-order correlation coefficients (Pearson's r's) among the hazard-seriousness ratings. With the exception of drought, the hazard-seriousness ratings are strongly intercorrelated among themselves. Flood, earthquake, and fire seriousness, are all strongly and positively correlated ($r = .42, .34$, and $.45$, respectively) with each other, indicating that persons who see one as serious tend to see the others as serious. These

TABLE 5.3

Correlations Among Hazard Seriousness Ratings, California Residents

	Hazard			
	Drought	Flood	Quake	Fire
Drought	---	.04	-.03	.09
Flood	.04	---	42	.34
Quake	-.03	42	---	.45
Fire	.09	.34	.45	---

correlations are strong enough to warrant combining the three separate indicators into an overall hazard-seriousness score. The resulting index, a simple sum of responses to the three component indicators, thus ranges from 3 to 30

Using the overall hazard-seriousness index, we can question which characteristics of individuals influence their assessments of the seriousness of hazards. Table 5.4 presents the regression of the index on selected personal characteristics. As one might expect, location tends to be the dominant

TABLE 5.4

Regression of Hazard Seriousness Index on Selected California Resident Characteristics

Independent Variables	b	s.e.
I. Community[a]		
El Dorado	-1.81	.75
San Diego	-0.03	.76
Shasta	-0.46	.74
Mendocino	-1.23*	.74
Oakland	-1.20*	.74
San Mateo	-1.87**	.76
Sacramento	-1.06	.74
Los Angeles	5.89	.79
II. Disaster Experience		
Flood	1.20**	.43
Quake	1.04**	.40
Fire	-0.54	.44
III. Background Variables		
Income	-0.26**	.07
Republican[b]	0.15	.49
Democrat[b]	0.73	.42
Age	-0.04**	.01
Home Owner?	-0.18	.43
Residence Length	-0.00	.01
Intercept =	11.92	
R^2 =	.24**	

t-test against the null that b = 0
* = Significant at alpha = .10
** = Significant at alpha = .05

[a] Stockton is the omitted category

[b] Republican and Democrat are entered as dummies, Independent is the omitted category

characteristic: Los Angeles respondents view these problems as more serious than do residents of any other city, by a large margin. Next to Los Angeles, the highest overall hazard-seriousness score is in Stockton (the omitted category). The coefficients for all remaining cities are negative, meaning that residents of these cities see the problem as less serious than do residents of Stockton. The lowest overall scores are for San Mateo and Eldorado.

Both flood and earthquake experience increase the seriousness attributed to natural hazards problems; both effects are statistically significant. The coefficient for fire experience, however, is negative and statistically insignificant

Only three of the background variables retain significant effects on overall hazard seriousness in the multivariate analysis. Democrats view these problems as marginally more serious than do Independents or Republicans; high-income respondents see these problems as less serious than do low-income respondents; and older respondents see the problems as less serious than do younger respondents. Thus, the highest level of seriousness attributed to natural hazards problems in California comes among younger, less affluent Los Angeles Democrats. Finally, the regression model in Table 5.4 accounts for just under one-fourth of the variance in overall hazard-seriousness ratings (R^2 = .237), the largest share of which is attributable to the dummy variables representing city.

Following the model of the elite survey, the California population survey also asked respondents to estimate the probability that their community would experience a serious disaster of each type over the next 10 years. Results are shown by city in Table 5.5 (top panel); city-by-city comparisons between elite and general-population estimates of the return probabilities for floods and earthquakes are shown in Table 5.6.

The estimated return probabilities for each of the three hazards are positively and significantly correlated with the seriousness attributed to each hazard problem. For floods, the correlation between attributed seriousness (Table 5.2) and perceived return probability (Table 5.5) is r = .33; for earthquakes, r = .32; and for fires, r = .31. These moderate positive correlations suggest that these two variables—seriousness and return probability—are different manifestations of the same underlying phenomenon, namely, the concern that people feel about their risk from natural hazards. Both variables are largely a function of objective community risk and the community's or respondent's prior disaster experience.

Thus, unsurprisingly, the highest estimated probability for a serious earthquake is found among Los Angeles respondents, in the aggregate, Los Angeles residents believe that the probability is 56% that a serious earthquake will occur in their community in the next 10 years. Other communities with probabilities of more than 40% are Mendocino County, Oakland, San Diego, and San Mateo.

TABLE 5.5

Perceived Risk from and Sense of Concern About Natural Hazards Problems in California, by City

		El Dorado	Los Angeles	Mendocino	Oakland	Sacramento	San Diego	San Mateo	Shasta	Stockton
I.	Average Perceived Return Probabilities[a]									
	Quake	18.9	56.2	41.2	46.0	30.5	41.7	48.9	16.9	35.1
	Flood	9.2	22.8	28.2	16.8	24.5	17 8	23.4	23.8	26.4
	Fire	59.8	65.1	57.6	48.7	24.4	52.7	31.7	56.2	22.6
II.	Perceptions of Special Community Risks[b]	%	%	%	%	%	%	%	%	%
	Dams	5.3	53.7	47.9	7.8	51.1	25.6	49.5	58.2	34.8
	Explosion	1.0	45.7	6.4	40.6	46.1	43,5	14.9	17.2	36.3
	Nuclear	8.3	20.5	1.0	10.3	48.9	42.2	10.1	0.0	22.6
III	Sense of Concern[c]	%	%	%	%	%	%	%	%	%
	Building Damage	39.0	43.4	44.0	31.0	41.0	33.0	38.0	24.2	32.3
	Contents Damage	41.0	36.0	44.0	51.5	36.0	21.0	35.4	26.0	36.0
	Injury	47.5	62.0	64.0	60.6	40.0	45.0	56.0	49.0	56.6
	Unprepared	22.4	38.8	36.7	51.0	24.7	25.3	28.1	32.3	36.1
	Delays to Hospital	45.9	49.5	57.0	64.0	34.0	35.4	38.8	45.0	42.4
	Hospitals Unprepared	53.6	52.6	56.0	72.0	32.0	34.7	45.0	49.5	53.5
	Services Out	48.5	51.5	49.0	62.6	42.4	30.3	51.0	51.0	47.0
IV.	Average Community Concern[d]	4.5	5.0	5.2	6.0	4.11	3.9	4.6	4.8	5.2

[a] "Over the next ten years, what are the chances that your community will experience a serious /DISASTER TYPE/? What we mean by percent chance is the kind of thing we hear on weather reports, like '40% chance of rain.'" Cell entries are the mean responses to the ensuing three questions. Thus, for the total California population, the average response was that there is a 37.4% chance of a serious earthquake in the next ten years, etc.

[b] "As far as you know, are there any special features of your community that would tend to make for special dangers should a natural disaster occur? For example, are there any...

dams that might collapse?

factories or military installations with explosives or dangerous chemicals?

nuclear power plants whose safeguards might fail?"

Cell entries are the proportions responding "yes" to each question. Thus, in the total sample, 37.5% said that there were dams in their communities that might collapse in the event of a disaster, etc.

[c] "We are interested in how concerned people are about what would happen to them and their families if a serious natural disaster were to occur in this community. Are you very concerned, somewhat concerned, or not at all concerned that...

the building in which you live would suffer serious damage?

the contents of your home--furniture, carpets, appliances--would be seriously damaged?

that you or someone in your family would be seriously injured?

If a serious natural disaster were to occur in this community, are you very concerned, somewhat concerned, or not at all concerned that...

the police and fire departments would be unprepared?
there would be long delays in getting people to hospitals?

hospitals would not be able to take care of all the people needing medical attention?

Phone services, electricity, or natural gas would be out of service for more than a day?"

Cell entries are the proportions responding "very concerned" to each question. Thus, in the total sample, 38.4% said they would be very concerned that their dwelling would be seriously damaged in a disaster, etc.

[d] Mean score on "community concern" index; see text for explanation.

TABLE 5.6

Estimated Return Probabilities for Floods and Earthquakes, by City: Comparisons Between Elite and Mass Responses

	Flood		Earthquake	
City	Elite	Mass	Elite	Mass
El Dorado	6.1	9.2	12.6	18.9
Los Angeles	15.7	22.8	48.6	56.2
Mendocino	31.5	28.2	32.5	41.2
Oakland	16.2	16.8	55.6	46.0
Sacramento	21.0	24.5	24.3	30.5
San Diego	22.8	17.8	26.0	41.7
San Mateo	17.9	23.4	45.7	48.9
Shasta	41.0	23.8	13.5	16.9
Stockton	17.4	26.4	18.4	35.1
	$r = +.60$		$r = +.62$	

In the total sample, the perceived probability of a serious earthquake in the next 10 years ($P = 37.4\%$) is roughly twice that of a serious flood ($P = 21.4\%$). Furthermore, the estimated earthquake probabilities are higher than the estimated flood probabilities in eight of the nine communities (Shasta County is the only exception). These data, and the parallel elite data in Table 5.6, suggest that California residents and elites do *not* have a very realistic sense of the relative magnitudes of their earthquake and flood problems. Of course, nobody knows for certain the probability of a serious California earthquake in the next 10 years; in some accounts, the odds are depicted as being very close to 1.0. However, the probability that California will experience at least one very serious flood sometime in the next 10 years is *very* much higher than the probability that the state will experience at least one very serious earthquake, so there is clearly some lack of realism reflected in the estimated odds reported here. The exaggeration of earthquake hazard relative to flood may reflect only that seismic hazard has received substantially more publicity in California.

For the total resident sample, the probability of a serious flood in the next 10 years is just above 20%, with little variation across cities. Eldorado respondents give the lowest flood odds ($P = 9.2\%$); Mendocino County respondents the highest ($P = 28.2\%$).

Fire is seen as a more likely hazard than either flood or earthquake, in the

total sample and in six of the nine specific communities. In five of the nine, the perceived probability of a serious fire in the next 10 years is more than 50%. Los Angeles again leads the list, with 65.1%; other communities above 50% are Eldorado County, Mendocino Couonty, Shasta County, and San Diego.

Table 5.6 compares, city-by-city, the elite and mass perceived return probabilities for two hazards, floods and earthquakes. Again, the extensive elite-mass agreement registered in these data is impressive. Across the 18 comparisons shown in Table 5.6, the average absolute difference between elite and mass estimates is 7.3 points (on a 100-point scale)—it is a bit higher, indicating less agreement, for earthquake odds (8.6) and a bit lower for floods odds (6.0). There are but three instances of serious disagreement, defined as a difference of more than 10 points. In Shasta County, elites see floods as substantially more probable than local residents (41.0% versus 23.8%). In San Diego and Stockton, local residents see earthquakes as substantially *more* probable than elites (41.7% versus 26.0% in San Diego; 35.11% versus 18.4% in Stockton). These exceptions aside, the broad picture that emerges from these comparisons is that elites and local residents tend to agree on the likelihood of a serious disaster in their communities over the ensuing decade. This is also manifested by the high correlations, $r = +.60$ and $r = +.62$, for the sets of elite-mass comparisons.

Special Dangers

There are, of course, dimensions to a person's concern over natural hazards that are not entirely captured by either the seriousness ratings or the estimated return probabilities. In the California resident survey, we tried to discover additional facets of hazard-related concern. One sequence of questions, for example, asked respondents whether there were any special features of their communities—dams, factories, or military installations posing some explosion potential, or nuclear power generation facilities—"that would tend to make for special dangers should a disaster occur." The percentages responding yes to these questions are shown in the second section of Table 5.5, first for the total resident sample, then separately for each city.

In the total sample, the highest level of concern is expressed over dams that might collapse. Overall, just under 40% mentioned this as a possible problem in their community. In five of the nine communities, the percentage mentioning dams as a possible problem is close to or greater than 50%: Los Angeles, Mendocino County, Sacramento, San Mateo, and Shasta County. Possible dam failure in a serious seismic event has been much discussed throughout California, the near-collapse of at least one dam in the 1971 San

Fernando earthquake received considerable attention. In five California cities, at least, this concern over possible dam failures during a natural disaster event has apparently penetrated rather deeply into popular thinking.

Twenty-seven percent of the total sample expressed a similar concern over "factories or military installations with explosives or dangerous chemicals." In four communities, concern on this point exceeds 40% (Los Angeles, Oakland, Sacramento, and San Diego). In Oakland and San Diego, this appears to be a more serious problem than the possibility of dam failure. Interestingly, respondents mentioning chemicals or explosives as a possible problem tend to be concentrated in the larger California cities.

Finally, 17.9% of the total sample mentioned "nuclear power plants whose safeguards might fail" as a possible hazard problem in their community. In Sacramento and San Diego, concern over this point is especially high. At least 40% of the respondents in both cities expressed some concern about nuclear power plants in the event of a natural disaster.

From the point of view of these special vulnerabilities, Sacramento appears to be seen as the potentially most lethal of the communities in the sample. About 50% of the Sacramento respondents said *yes* to all three questions. In like fashion, Eldorado County seems to residents to be the least lethal community. Less than 10% of Eldorado residents responded *yes* to any of the questions

All three of these community-specific hazard concern indicators vary according to characteristics other than community, although in no case are these correlations especially strong (data not shown). The three items correlate positively and significantly among themselves, so that those who express a concern on any of the three points are likely to express a similar concern on either of the remaining two points. These correlations range from $r = .17$ (dams by nuclear power plants) to $r = .37$ (explosions by nuclear power plants). All three also correlate positively with the seriousness attributed to flood, earthquake, and fire problems (these correlations are in the range of .1-.2), and likewise with the estimated return probabilities for floods and earthquakes, but not fires (correlations also in the range of .1 - 2). Thus, there is a moderate tendency for persons who think hazards are relatively serious problems or who think a serious flood or earthquake is relatively probable in the next 10 years to also worry disproportionately about possible dam failures, explosions, or nuclear accidents in the event of a serious disaster. The three items in question also appear to tap, at least in part, some generalized sense of concern over natural hazards. However, the tendency to worry about any of these three points is not strongly correlated with prior disaster experience; correlations with disaster experience variables range from $r = .07$ to $r = -.06$ and are not consistent in sign.

Finally, of the several social background variables considered in earlier

analyses, only length of residence in California correlates consistently with this measure of concern. The correlations are all negative: (Concern *decreases* as length of residence in California increases). The magnitudes are $r = -.05$, $-.19$, and $-.10$ for dams, explosions, and nuclear accidents, respectively. Thus, there is a modest tendency for longer-term residents to be less concerned than shorter-term residents on these three points.

Personal Concern

A final set of questions in the disaster-concerns sequence asked "how concerned people are about what would happen to them and their families if a serious natural disaster were to occur" in their communities. The third section of Table 5.5 shows the percentage that were "very concerned" about each of seven possibilities. Three of the seven deal with calamities that might befall respondents or their families; the remaining four deal with more systemic problems that would conceivably affect large segments of the community. We call these *personal concerns* and *community concerns*, respectively.

Of the three items applying to personal concerns, the one that shows the highest level of concern is the possibility of personal injury. Of the total sample, 53% said they would be very concerned about personal injury in the event of a natural disaster. In contrast, only 38% would be very concerned about damage to their residential structures, and 36% would be very concerned about damage to the contents of the structure. Thus, at least in California, people tend to worry more about personal injuries than about damages to property in the event of a natural disaster.

Personal concerns vary little from city to city. In general, the highest level of concern is registered in Oakland; the lowest in San Diego and Shasta County. However, the differences across cities are not substantial.

The three personal concern items correlate strongly and positively among themselves; correlations range from $r = .56$ to $r = .71$. Thus, we have combined them into an overall personal concerns index (by taking a simple sum of responses to the three items). The resulting personal concerns index varies from zero (respondent is "not at all concerned" on all three items) to 6 (respondent is "very concerned" on all three items). For the total sample, the average response on the index is 3.5 and is thus slightly skewed towards the higher, or more concerned, end. By city, averages vary from a high of 4.1 in Oakland to a low of 2.9 in San Diego

Regression (data not shown) of the personal concerns index on selected variables showed us that, with Stockton as the omitted category, the only city dummies showing significant results are San Diego and Los Angeles

Both coefficients are negative, meaning that residents in these communities are less concerned about personal injury and property loss than residents in other communities. Neither flood seriousness nor the estimated return probability for a flood significantly predicts personal concerns; the corresponding variables for earthquakes and fires, however, are both positive and statistically significant. Coefficients for the variables representing a respondent's personal disaster history are all *negative*, so people who have experienced a disaster evidence *less* personal concern than those who have not. None of the coefficients is statistically significant. In general, then, the highest level of personal concern exists among individuals who think hazards are a serious problem and who feel that the probability of another disaster is relatively high, but who have never personally experienced one.

Of the standard background variables, only two show significant and interesting effects. First, personal concerns increase with the size of the respondents' families; respondents with many children show more personal concerns than respondents with few or no children. Second, the respondent's age is *negatively* related to the personal concerns index; older respondents are less concerned than are younger respondents. The coefficient for length of residence in California is also negative, but it is statistically insignificant.

Finally, the survey contained five questions answered by the *interviewer* concerning what might be called the hazard vulnerability of the respondent's housing—that is, whether the structure was on the side of a steep hill or incline, at the base of a canyon, in a ravine, surrounded by brush or dry forest, or a mobile home. With the exception of respondents living in a ravine, none of these variables showed any significant effect on the level of personal concern. Interestingly, the coefficient for living in a ravine is *negative* and statistically significant. People who live in ravines are somewhat less concerned on these points than are people who do not

Community Concern

The most widespread community concern shown in Table 5.5 is that "hospitals would not be able to take care of all the people needing medical attention." In the total sample, just over 50% said they would be very concerned about this possibility. There is also a fairly high level of concern that essential services would be disrupted (48% "very concerned"). Concern that "the police and fire departments would be unprepared" is least extensive. About 33% of the total sample said they would be very concerned about this.

In general, these community concern data give the impression that the

people of California are not highly confident that their local services could deal adequately with the aftermath of a disaster. In the total sample, for example, 36.7% said they were "not at all concerned" that police and fire departments would be unprepared, so roughly 66% of the total harbor at least some concern on this point. Likewise, only 21.5% are not at all concerned about possible delays getting people to hospitals, another 20 6% are not at all concerned about hospitals being unprepared to handle the load, and another 20.4% are unconcerned about disruptions of essential services. Combining the four items, we find only 6.5% (56 of 866 respondents) who say they are not at all concerned on all four questions; thus, something over 90% of the California population evidences at least some concern that some local public service would be inadequate to handle the aftermath of a serious disaster. In contrast, 20 6% of the total sample say they are *very* concerned on all four points. All else equal, then, the data suggest at least the possibility of sizable public support in California for a general strengthening of the disaster response capabilities of local emergency services.

The lack of confidence in local services in the event of a disaster can be interpreted in two ways, depending on whether one stresses local services or disasters. Residents may be very confident in their local services but worry whether the event might stretch the capacities of what would ordinarily be very good or excellent services. Alternatively, residents may be expressing a low opinion of the services' ability to cope with reasonable workloads as well as the overloads brought about by disaster emergencies

The four community concern items correlate positively and strongly among themselves; the correlations range from $r = .34$ to $r = .65$. To reduce the sheer bulk of information, then, the four items have been combined into an *overall community concerns index*. For purposes of index construction, persons saying they are "not at all concerned" on a question are scored zero, those "somewhat concerned" are scored 1, and those "very concerned" are scored 2; the summed index therefore varies from zero (not at all concerned on all four items) to 8 (very concerned on all four items). In the total sample, the average of the resulting index is 4.8, and the entire distribution is clearly skewed toward the higher, or more concerned, end of the scale.

The last panel of Table 5.5 shows community averages on the 8-point overall community concerns index. As indicated, the degree of community concern varies substantially and significantly across the nine cities ($F = 6.33$; $p < 000$). This is also evident in the item-by-item results shown in Table 5.5 The highest level of community concern, by far, is in Oakland, ($\bar{X} = 6\ 0$); which has a community concerns index score of 6.0 and shows the highest concern on each of the four community concern measures. Other communities that are more concerned than the average include Mendocino

County, Stockton, and Los Angeles. In contrast, San Diego residents seem rather confident in their local emergency services; their score on the index is only 3.9. The Sacramento score (4.1) is also well below the overall average.

Regression of the community concerns index on selected background characteristics showed that, with Stockton as the omitted category, there are three cities with significant negative coefficients—San Diego, Sacramento, and Los Angeles—and one—Oakland—with a significant positive coefficient. The concern of Oakland residents with the efficacy of their local emergency services comes through in all analyses.

The seriousness attributed to floods and fires is positively and significantly correlated with community concerns; the more serious respondents feel these problems to be, the more concerned they are about the adequacy of local emergency services. The coefficient for earthquake seriousness is also positive, but not statistically significant. Among the return-probability variables, only that for earthquakes shows a significant and positive effect; coefficients for fire and flood probabilities are positive, but not significant. Finally, respondents' personal experiences with floods, earthquakes, and fires are *not* significantly related to their community concern scores. As in the personal concerns data, the general pattern is that the highest level of concern tends to come from persons who think that disasters are a serious problem and that the probability of future disaster is high, but who have themselves never personally experienced one.

None of the interviewer indicators of housing vulnerability significantly related to community concerns scores.

Of the standard background variables, only three show noteworthy effects. First, Republicans show less community concerns than either Democrats or Independents. The coefficients for age and income are negative but not significant Length of residence in California is negatively and significantly related at the .10 level ($p = .076$) In general, less affluent individuals, younger persons, and persons who are relative newcomers to the state show the highest levels of concern over the adequacy of local emergency services, but all such relationships are weak.

Summary and Conclusions

The key findings from the survey concerning the seriousness attributed to hazards problems by California residents may thus be summarized as follows:

1. Like their political elites, California residents rank natural hazards low on their agenda of political concern. In 1977, fires, earthquakes, and floods

were all seen to be *less* serious problems than pornography, and *much* less serious than matters such as inflation or crime.

2. The problem of drought ranked second only to inflation as a serious problem in the minds of California residents in 1977 (the worst western drought year in recent memory). The importance of this finding is that it shows that, under proper circumstances, hazards-related problems can indeed rise quite high on the political agenda. The data suggest that hazards become serious problems during, or in the immediate aftermath of, a major natural disaster, but sink very low on the agenda between one serious disaster and the next. Perhaps this explains, at least in part, why it has traditionally been easier to introduce ad hoc policy fixes in the immediate aftermath of a disaster than it has been to sustain a more rational program of hazard-risk management during the interim, non crisis periods.

3 All indicators of hazard concerns, including the seriousness attributed to hazards problems, vary across cities in a manner consistent with the differing degrees of objective risks. There is some evidence that the seriousness data presented here represent some level of rational judgment on the part of our respondents.

4 Virtually all questions about the seriousness with which hazards problems are regarded correlate strongly and positively among themselves, suggesting that all indicators tap some unitary underlying disaster concern dimension.

5. At all points where a direct comparison is possible, there is a substantial level of agreement on these issues between the general population and the elites of California. This holds both in the aggregate, in each city, and for each disaster type for which we have data.

6. However measured, concerns over natural hazards problems in California tend to be highest among younger and less affluent respon and among relative newcomers to the state These effects are generally striking, but they tend to be reasonably consistent across items. The suggestion is thus that the longer one resides in California, the more jaded one becomes about the problem

7. Fires are seen as the most probable disaster type over the next 10 years, earthquakes as second most probable, and floods as least probable. A serious earthquake is perceived as twice as likely as a serious flood, which is *not* a very realistic picture of the relative seriousness of California's flood problem. The publicity given to seismic hazards in California may have caused an unwarranted denigration of the seriousness of the state's flooding problem

7. Although California residents do not see natural hazards as very serious community problems, they do exhibit relatively high levels of concern over what would happen to themselves, their families, and their com

munities were a serious disaster to occur. Sizable minorities, for example, state that there are dams, concentrations of chemicals or explosives, or nuclear power plants in their communities that would greatly worsen the effects of any natural disaster. Likewise, slightly more than 50% of the sample is "very concerned" about the prospect of personal injuries to themselves or their families in the event of a disaster, and substantial minorities are also very concerned about the possibility of damage to their homes and personal belongings. Finally, there is a great deal of concern about whether local emergency services would be adequate to handle the aftermath of a serious disaster. Over 90% of the California population evidences at least some concern on this score.

The contrast between the low seriousness attributed to natural hazards as an issue and the apparently high personal concern very much calls to mind Mills's (1959) distinction between *private troubles* and *political issues*. In Mills's scheme, the former "occur within the character of the individual," whereas the latter "transcend the individual and the range of his inner life [p. 8]." By this logic, in California at least, and probably everywhere else, natural-hazards problems are seen more as private troubles than as political issues. They are viewed as calamities befalling individuals, resulting from forces over which there is little or no control, rather than as systemic problems for which political solutions are possible. Thus, mitigative efforts targeted toward the behavior of individuals (e.g., hazards insurance) are considered more acceptable or appropriate than efforts targeted toward the social organization of the community. Private troubles, it is reasoned, call for private solutions, whereas political issues mandate political responses. The current climate, it appears, tends to favor the first of these over the second.

LEVELS OF DISASTER PREPAREDNESS

If natural disasters have more of the character of private troubles than political issues, then the question of individual preparedness for disaster—the measures that individuals take or fail to take to protect themselves and their families from disaster—becomes a relevant concern. As we have seen in all analyses, natural hazards do not rank high on the agenda of state and local political concerns, yet there seems to be quite a bit of personal concern, even worry, over what would happen to oneself and one's family were a serious disaster to strike. Are these personal concerns and worries translated into hazard-preparedness behaviors? Have Californians taken practical steps to avoid undue risk or to protect themselves should a disaster occur?

What, in short, is the level of hazard preparedness among the California sample?

Steps that individuals *might* take to lessen the risk of natural disaster may include equipping the house with emergency lighting, purchasing hazards insurance, or not locating in hazardous areas. There are many steps individuals can take; the question, then, is which ones are actually taken

Hazards Insurance

As shown in Table 5.7, residents' knowledge of the NFIP is nonexistent. The vast majority of California residents (91.4%) said that they had never even heard of the program at the time of the survey; most elites, in contrast, had at least heard of NFIP. The lack of knowledge among residents imposes very serious limits on the possibility of their protecting themselves from flood hazard through the purchase of flood insurance.

Not knowing in advance the extent of ignorance about NFIP, we included several follow-up questions dealing with the purchase of flood insurance, as previous results make inevitable, the numbers get ridiculously small. Of the 544 homeowners who were asked, only 6 (1.1%) said they had "considered getting flood insurance" for themselves, only 4 (.7%) had tried to get such insurance, and a lonely 3 respondents (.6%) actually carried a flood insur-

TABLE 5.7

Knowledge of the Federal Flood Insurance Program Among California Residents and Elites

	Residents[a]	Elites
Have you heard about FIP?[b]	(544)	(183)
No	91.4	16.5
Yes	8.6	83.6

[a] Insurance questions were asked only of homeowners, not of renters; thus the lower N.

[b] The question reads:

"The next set of questions is about the federal government's Flood Insurance Program. The idea behind the program is that the federal government will subsidize flood insurance for property owners in flood hazard areas, if, in return, local communities agree to establish policies which restrict further construction and development in those areas. Have you heard any discussion about a federal program of that sort here in (CITY OR COUNTY)?"

ance policy at the time of the survey. Most residents had never even heard of NFIP and therefore did not know whether their community was in the program or not. Having never heard of the program, very few people had ever considered purchasing, tried to purchase, or much less actually purchased, such insurance but the substantial majority felt that the general ideas behind the program, as we described it, were sound. These data suggest that interest in, and purchase of, flood insurance in California would increase substantially were people adequately informed about its availability and about their communities' participation in the program.

Earthquake insurance has penetrated much more deeply into the hazard-preparedness thinking of the California population. Slightly more than 25% of the homeowners in our sample said they had "considered getting earthquake insurance" for their homes. In Los Angeles and San Mateo, over 50% had at least considered such insurance (55% and 53% respectively) In other communities, however, notably Sacramento and Shasta County, few had considered purchasing earthquake insurance.

Of those who had ever considered purchasing earthquake insurance, 42.2% said that they actually had such insurance at the time of our survey; thus, slightly more than 10% of the homeowners in the sample say they currently carry earthquake insurance on their homes. The percentage of homeowners actually carrying earthquake insurance varies across cities. The high figure is registered for San Mateo, where about 22% of the homeowners in the sample say they currently carry earthquake insurance, the low figure is in Sacramento, where only 1.7% (1 of 59 homeowners) are so protected. Surprisingly, the Los Angeles figure, 16.7%, is not much higher than that registered for the state as a whole: more Los Angelenos have *considered* earthquake insurance, but relatively few have actually *bought* it

Regression analysis of the tendency to *consider* earthquake insurance yielded largely predictable results (data not shown) As one might expect, interest in purchasing earthquake insurance is highest among those who believe earthquakes are a serious problem, who feel that the probability of a future earthquake is high, who worry about the possible effects of a serious disaster on themselves and their communities, who have actually experienced an earthquake in the past, and who have relatively higher incomes.

The tendency actually to purchase insurance is much less predictable. Interestingly, *none* of the variables that predict the tendency to consider this insurance also predict the tendency to buy it, coefficients for seriousness, return probability, earthquake experience, personal and community disaster concern, and so on are all insignificant in this equation. Of the variables in our model, only two are significantly related to the purchase of earthquake insurance: Respondents living at the base of a hill or steep canyon are significantly more likely to have earthquake insurance than other respondents and respondents living in mobile homes are significantly *less* likely to have earthquake insurance than other respondents.

The truly interesting finding here is that although everything one would expect to cause some interest in earthquake insurance actually does, none of these things, apparently, inspire people to take the next step and actually purchase such insurance. The concerns that Californians feel about earthquake hazards, in short, are just that—they are not accompanied by much practical risk-aversive behavior.

A parallel set of questions about fire insurance found that 98.6% of the homeowners in the sample had considered fire insurance and 98.7% said they currently had such insurance. More than 80% said that such insurance was required by their mortgage bank. Of those who currently have fire insurance, 22% said that "all of the loss" would be covered were their homes destroyed by fire, 52% said that "most of the loss" would be covered, and 26% said that only "some of the loss" would be covered In sum, nearly every homeowner in California is insured against loss from fire, usually because such insurance is required as a condition for a mortgage Were flood and earthquake insurance likewise required as a condition for mortgages, the proportions owning these forms of insurance would doubtless be equally high.

Minimizing Personal Vulnerability

One way of being prepared for disaster is to minimize one's vulnerability by avoiding hazardous areas or circumstances. In California, the tendency to do otherwise is notorious. Throughout California, the most elegant homes, and thus the most desirable homesites, are on hills overlooking cities. Cities themselves are built over fault lines and related seismic hazards. Until recently, the disregard for seismic and other natural hazard planning in land-development, energy facility siting, etc , was virtually total.

The resident survey provides some information on the percentage of structures at risk; these are the hazard vulnerability of housing variables noted earlier (p. 120). Of the total sample, 9 3% of all respondents have homes on the sides of hills or on steep inclines; another 5% live at the bases of hills or canyons; some 2% live in ravines or canyons; and 16% live surrounded by dried out timber, brush, or grass. To this might be added another 5% who reside in mobile homes. Altogether, 25% of the households in the sample fell into one or more of these five categories If these percentages hold statewide, about 2 million households face a disproportionate hazard risk because of the location or type of their structures

The percentage of structures al risk varies significants across cities The

lowest by far is San Diego's 1%; the highest, 72%, is in Shasta County. Two other northern counties, Eldorado County and Mendocino County, are also well above the state average at 47% and 42% respectively.

A final sequence of questions concerning levels of personal hazard vulnerability asked about the presence of various safety devices in respondents' homes. These data are not especially encouraging. Although 97.8% of our respondents have flashlights or candles, and 83.9% have transitor radios, some 40% are without a first-aid kit, 57% do not have a fire extinguisher, and only 19% have installed a smoke alarm. These and all other data considered in this section clearly suggest that most Californians could do substantially more than they are at present to protect themselves from the threat of natural disasters.

This leads us to believe that the private worries our sample expressed concerning public emergency services may not be strongly held. Ater all, if individuals' worries about hazards are not accompanied by action within the province of households, then it seems unlikely that worries about the local hospitals would easily escalate into demands that those institutions take definite steps to prepare for such emergencies. In short, the private worries of Californians concerning natural hazards are low-level worries.

ATTITUDES TOWARD FEDERAL HAZARD-MANAGEMENT POLICIES

California residents match their elites' opinions of the seriousness of natural hazards to their local communities. Do they also display the same attitudes toward public policy and program options in natural hazard management? The California survey contained four items intended to reveal attitudes toward federal hazard-management policies; they were roughly parallel to three of the disaster policy items contained in the elite survey (see Chapter 4). Table 5.8 shows the marginal frequencies for the four items, and the views of local elites on parallel issues.

The most favored policy option among California's local elites emphasizes postdisaster relief. Eighty-four percent of the California general-population sample express agreement with this approach; among the California elites, the level of agreement is 58%. Also paralleling the elite results, the free-market approach is least attractive: some 57% of the general population, and 63% of the California local elites, *disagree* with this viewpoint on the management of hazards risk.

Separate questions were asked on land-use and building code approaches in the resident survey, whereas in the elite survey, both were combined into a single nonstructural mitigation question. Given this and other differences

TABLE 5.8

Hazard Management Policy Attitudes of the California Public and of California Elites

	CALIFORNIA POPULATION			
	Post-Disaster Relief[a]	Free Market[b]	Land Use[c]	Building Code[d]
	%	%	%	%
Agree	84	42	65	80
Disagree	15	56	33	19
Don't Know	0.8	1.1	1 9	1.1
100% =	(898)	(899)	(990)	(900)

	CALIFORNIA LOCAL ELITES[e]		
	Post-Disaster Relief	Free Market	Land Use/ Building Code
	%	%	%
Agree	58	37	44
Disagree	42	63	56
100% =	(177)	(186)	(178)

[a] The question:
For instance, one view says that natural disasters cannot really be predicted or controlled. They can happen to almost anyone at any time. Since there is not much that can be done to reduce risks in advance, the federal government should routinely provide financial assistance to victims of disasters for damage to their homes and other possessions. How about you? Do you agree strongly, agree somewhat, disagree somewhat, or disagree strongly with this policy?

[b] The question:
Another view is that people really know the risks they are taking when they live in areas prone to earthquakes, floods, and forest or brosh fires. Since people take these risks knowingly, they alone should bear the costs of damage to their homes and other possessions. How about you? Do you agree strongly, agree somewhat, disagree somewhat, or disagree strongly?

[c] The question:
Yet another view is that regardless of whether people really know the risks, the federal government should keep people from building in dangerous areas through regulations on how land can be used. How about you? Do you agree strongly, agree somewhat, disagree somewhat, or disagree strongly?

[d] The question:
A final view is that regardless of whether people really know the risks, the federal government should require local building codes that would make people construct buildings strong enough to withstand a serious natural disaster. Do you agree strongly, agree somewhat, disagree somewhat, or disagree strongly?

[e] The questions for local elites are not identical to those in the population survey. See Ch. 4 for exact wordings.

in wording and format, the results from the two sequences are not precisely comparable. Nonetheless, mitigating hazard risk through land-use management and building code restrictions seems to be *much* more favorably received among the general population than among the political leadership. Sixty-five percent of the general-population sample *agreed* that "the federal government should keep people from building in dangerous areas through regulations on how land can be used." Eighty percent agreed that "the federal government should require local building codes that would make people construct buildings strong enough to withstand a serious natural disaster." Among local California decision makers, in contrast, only 44.4% agreed that "the federal government should require stricter land-use controls and building standards to reduce risk from natural disasters." Given the noncomparability of items, perhaps one should not make much of this elite-public difference; however, the indication is that public thinking on these matters in California may be somewhat *more* approving of nonstructural mitigation policies than the thinking of the political leadership.

As might be expected, the land-use and building code items are fairly strongly correlated ($r = .35$), justifying our decision to combine the two questions into a single indicator of favorability toward non-structural hazard-risk-mitigation policies. The resulting scale was sharply skewed toward favorability. The average response was 4.22 and 53% of the sample scored 5 or 6 on the index, a finding that strongly suggests that the general California population is favorably disposed toward these approaches to the management of natural hazards risk.

How is this favorability distributed in the California population? Table 5.9 shows the results of a multiple regression analysis of the nonstructural mitigation favorability index, using selected background characteristics of the respondents as independent variables. As in the elite data, hazard policy opinions among the general population are not sharply structured, at least not by the variables considered here, R^2 for the total equation is only .07. Thus, all relationships obtained in the data are very weak and most of the variance in favorability is random with respect to the independent variables in the regression model.

In contrast to the findings for elites (see Chapter 4) among the general California population there is a tendency for favorability toward land-use and building code approaches to increase as the perceived seriousness of disaster problems increases, in these data, the effect is positive and statistically significant for both flood and earthquake seriousness. On the other hand, the effects for disaster experiences are *negative* for both earthquake and floods. People who have experienced one of these disasters are slightly less favorable toward nonstructural mitigation approaches than those who have not. Only the flood effect is statistically significant, however.

TABLE 5.9

Multiple Regression of NSM Favorability Index on Selected Characteristics of California Population

Independent Variable	b[a]	s.e.
Disaster Seriousness Measures		
Flood Seriousness	.067**	.036
Quake Seriousness	.084**	.031
Disaster Experience Measures		
Experienced Flood	-.283*	.149*
Experienced Quake	-.017	137
Personal Characteristics		
Republican[b]	.097	.176
Democrat	.484**	.148
Age	003	.005
Length of Residence	-.009**	.004
Family Income	-.044*	.024
Own	-.359**	.151
R^2 =	.07	
N =	(786)	

[a] Unstandardized regression coefficient.

[b] Party identification is entered as a set of dummy variables; "independent" is omitted.

Asterisks denote statistically significant coefficients: ** for alpha = .05, * for alpha = .10.

Our analysis of respondents' personal characteristics found that Democrats tend to be *more* favorable to nonstructural mitigation than either Republicans or independents. Homeowners are *less* favorable than renters and favorability to nonstructural mitigation *decreases* as length of residence in California and family income increase.

Thus, among the general California population, the highest levels of favorability toward nonstructural mitigation approaches to hazards risk are found among newer, less affluent residents, among renters, among Democrats, and among those who see floods and earthquakes as serious problems but have never experienced one. These patterns suggest what might be called a *jadedness effect*. Newcomers to the state worry about the hazards risks and are attracted to nonstructural mitigation solutions, whereas residents of longer standing tend to denigrate the seriousness of the problem and to be less attracted to these solutions.

Both elite and mass favorability toward nonstructural mitigation approaches varied significantly by city (see Table 5.10). There appears to be a reasonable degree of consistency between the data sets for elites and the public, as indicated by a correlation of $r = .61$. Communities with relatively favorable elites also tend to have favorable general populations. Of course, this finding is open to several interpretations: local elites may function as opinion leaders or the public may elect local officials who share their views. Since natural hazards are not likely to be especially salient political issues in most of these communities, a better interpretation is that some common factor is simultaneously influencing both elite and mass responses: the disaster history and experience of each community, for example.

The questions considered so far relate in every case to the proper *federal* policy with respect to natural disasters. Our questions about *local* disaster policy revealed that California respondents are, if anything, even *more* favorable to nonstructural mitigation measures taken at the local level. One survey item, for example, read: "Many California communities have laws prohibiting people from constructing homes and other kinds of buildings in flood plains, areas prone to forest or brush fires, or on sites close to earthquake faults. Do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose such legislation or ordinances for this community, that is, for (CITY OR COUNTY)? [see Appendix B] Although the question is strongly

TABLE 5.10

Non-Structural Mitigation Favorability by Community, Local Elites and California Population

	Population Data			Local Elite Data		
	Average Score	Rank	N	Average Score	Rank	N
Oakland	4.74	2	89	3.19	1	22
El Dorado Co.	3.56	8	100	2.72	6	16
Los Angeles	4.77	1	100	2.82	5	25
Mendocino Co.	3.18	9	99	2.42	9	13
Sacramento	4.40	5	98	3.04	2	18
San Diego	4.63	3	100	2.88	4	22
Stockton	4.58	4	96	2.65	7	21
San Mateo	4.22	6	99	2.60	8	20
Shasta Co.	3.93	7	98	2.93	3	21

r = .61

phrased (e.g., outright *prohibitions* on building in hazardous sites), about 41% of all respondents agreed strongly with this viewpoint and another 27% agreed somewhat; thus, 68% of the residents in these cities support at some level the notion of strict land-use controls for hazard-risk mitigation. A related question on local building code requirements for flood- and earthquake-proofing of new structures likewise found 57% agreeing strongly and 31% agreeing somewhat, or an overall level of support exceeding 85%. Thus, very large majorities of the California population support nonstructural mitigation approaches to hazard-risk management as an element of both federal and local disaster policy. As in the questions about federal policy, there was also some variation by city in these responses, with general patterns similar to those shown in Table 5.10.

Unsurprisingly, persons favoring nonstructural policy at the federal level also favor them as matters of local hazard policy. The correlation between the two land-use questions is $r = .59$; between the two building code questions, $r = .43$.

After each of these two local policy questions, we also asked, "As far as you know, does your community have any such laws?" Many respondents were unable to answer this question. of the total sample, 24.4% responded "don't know" to the land-use question; this percentage was as high as 35% in some local communities. On the building code question, 22.4%—again, ranging up to a high of 35% in some communities—responded "don't know." Thus, a large minority of California residents are uncertain about the status of nonstructural hazard-risk mitigation measures in their communities.

Even among respondents venturing a substantive (*yes-no*) answer to these questions, there is little consensus on whether any given community has these laws or not. Most respondents in all cities felt that their communities did *not* have a land-use regulation similar to the one asked about. This is rather surprising since California state law prohibits people from constructing homes on sites close to earthquake faults. On the other hand, the distinction that these are state, not community, laws, may account for the large percentages who state that their communities do not have them.

When we asked if there were local hazard-mitigating building codes, the responses were even more ambiguous. The firmest agreement was registered in Los Angeles, where 68.4% of those giving a substantive response said that the community *did* have such a law. In all remaining communities, only 40-60% of respondents agreed on their answers. Virtually all California communities have at least some regulations covering building standards for new construction in hazard-risk areas, yet in the total sample only about 40% affirmed that this was true of their community. Another 40% said it was false, and the remaining 20% simply did not know. Thus, although the data make it plain that there is much attitudinal support in California for nonstruc-

tural mitigation approaches to the management of hazards risk, there is also rampant confusion among the general population concerning the existence of these legislative measures in their communities.

The 45% of our sample who said that their communities did have laws of these kinds on the books were asked a follow-up sequence that focused on the *effects* these laws had had on themselves and the community. Despite the general favorability of respondents to land-use and building code measures, these data show a high recognition of the possible negative effects of such measures. For example, 93% of the respondents agreed that the laws had "raised the cost to taxpayers of constructing new schools, hospitals, and other public building"; 90% felt that these laws had "increased the costs of building new homes and apartments"; 75% felt that they had "raised the operating costs for industry and business [located in the community]", 75% felt that they had "caused higher taxes"; and 74% felt that such laws had *not* "lowered the risk of natural disasters." Indeed, of the 17 questions posed in the sequence, we find as many or more negative responses as positive ones on 10 Majorities also felt that these laws had made it more expensive for business and industry to locate in the community (69%), had *not* made people better prepared for disaster (65%), had *not* made respondents feel safer (57%), had complicated the buying and selling of homes (54%), and had caused insurance premiums to increase (50%). On the positive side, strong majorities said that the laws had *not* made housing difficult to find (81%), had resulted in safer buildings (85%), and had *not* made the community a less desirable place to live (87%). The general impression given by these data is thus that nonstructural mitigation laws have a few positive effects and many negative effects. Given the prevailing favorable attitudes of our respondents to such measures, we therefore infer that in their minds, the benefits (for example, safer buildings) easily outweigh the costs.

The attitudinal data thus suggest the following conclusions:

1. The general population of California, like elites across the nation, is highly in favor of the notion of postdisaster relief as a natural-hazards policy opposed to the free market approach.

2. California residents are strongly attracted to nonstructural mitigation measures as appropriate hazard-management policies. Support is high for both land-use and building code approaches at either federal or local levels There is some tentative indication in the data that the thinking of the general public on these matters may be somewhat *more* progressive than that of local California elites

3 Those most in favor of nonstructural mitigation tend to be newcomers to the state, those who think disasters are a relatively serious problem but have never experienced one, those living in cities where local elites are also

TABLE 5.11

Approval of Local Land Use and Building Code Legislation California Resident Sample

Approval Level	Land Use Regulation[a]	Building Code[b]
Strongly Agree	41%	57%
Agree	27%	30%
Total Agree	67%	87%
Disagree	16%	7%
Disagree Strongly	17%	6%
Total Disagree	23%	13%
100% =	(882)	(876)

[a]Agreement with principle of local laws "prohibiting people from constructing homes and other kinds of buildings in flood plains, areas prone to forest or brush fires, or on sites close to earthquake faults."

[b]Agreement with principle of local laws "requiring new buildings in flood plains to be flood-proofed, new buildings in fire areas to be fire resistant, and new buildings in earthquake-prone areas to be built to minimize earthquake damage."

favorably disposed toward nonstructural mitigation, and those who perceive the fewest negative effects of such policies on themselves and their communities.

4 In general, people are *not* very well informed about the status of nonstructural mitigation legislation in their local communities

5. Finally, the California population recognizes that there are nontri costs associated with nonstructural hazard-mitigation policies, espec costs to the public sector, but apparently feels that the benefits of these policies, especially in regard to public safety and preparedness, adequately compensate for these costs.

CONCLUSIONS

The study of public opinion on hazards-mitigation issues in California is especially interesting because California is a state where one might expect the strongest popular interest in disaster issues California's hazard risks status is quite high· Earthquakes are a very *real danger*, as are *floods*, *brush*

fires, and landslides. California is one of the more progressive states as far as hazard legislation is concerned; it has hazard-conscious building codes and land-use regulations. In short, if the general population of any state might be expected to show high levels of concern on hazards issues, California would be a likely candidate.

The data in this chapter however, indicate otherwise. By and large, the California residents interviewed agreed with all other elites that hazards are not as important as other issues that face their state and communities. Although they are more favorable than elites to federal nonstrucutral hazard-mitigation policies, to local laws regulating land use, and to strict building codes, their awareness of existing laws is very low. Residents seldom acted to lessen risk to themselves and to their families; awareness of and participation in the NFIP is almost nonexistent. Few are aware of earthquake insurance and fewer have purchased it.

In short, although there is some sympathy and support for nonstructural hazard-mitigation actions and little opposition, the solidity of this support is open to question. In this respect, community and state elites in California appear to be mirroring their constituents. From our data it is manifestly impossible to tell whether this congruence represents the outcome of a process whereby elites influence the general public or vice versa, or whether both are reflecting the working of some process that is common to both elite members and the general public.