"Documento original incompleto"

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Dear Business, Agency and Government Leader or Concerned Citizen:

Scientists increased the probabilities for big earthquakes in the San Francisco Bay Area following the 1989 Loma Prieta quake. Efforts to explain the significance of the increased earthquake probabilities to the public took an unprecedented form. People from different fields and organizations formed a team to prepare and distribute a 24-page color newspaper insert to people in 13 Bay Area counties. This insert was distributed in the fall of 1990. It described the science of earthquakes and earthquake forecasting. It also suggested what people should do to reduce possible losses and get prepared.

This report describes how and why the public, business, health, safety and welfare organizations and government agencies responded to the newspaper insert. Ultimately, we make recommendations on how to make future earthquake forecast information more effective.

We hope that you find the results of this study useful. In it, scientists responsible for issuing future quake risk information can learn how it can be effectively communicated to people and organizations. Government emergency preparedness staffs responsible for issuing and responding to earthquake forecasts can use our findings to enhance public, agency and private sector response. Members of the private sector can learn of the organizational constraints and incentives that operate to determine corporate response to quake forecasts.

This brochure is the third in a series prepared by the Hazards Assessment Laboratory to distribute research findings on natural hazards to non-technical readers. Please copy it and share it with others.

Sincerely,

Dennis S. Mileti, JoAnne D. Darlington, Colleen Fitzpatrick, Paul W. O'Brien

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I. Revised Quake Probabilities in the Bay Area

The National Earthquake Prediction Evaluation Council began routine meetings in 1984 to review data from areas in the nation with earthquake prediction potential. Then in 1986 NEPEC asked the U.S. Geological Survey if it could review a quake forecast issued for southern California in the early 1980s. The Survey asked NEPEC to consider quake potential in both northern and southern California in the Spring of 1987. The Working Group on California Earthquake Probabilities was formed and issued its report in 1988. The report concluded that a 50% probability existed for a magnitude 7.0 or greater quake to occur in both northern and southern California in the next 30 years. But the October 1989 Loma Prieta earthquake led the Working Group to reconsider its conclusions. A subsequent report was issued in 1990. The total 30 year probability of one or more large earthquakes was set at 67% for the Bay Area.

II. Informing the Public with a Newspaper Insert

Scientists, government officials and members of private disaster response organizations sought an effective way to inform citizens about the revised probabilities. Social scientists convinced them that a written document would be the most effective. A document was prepared to include in a Sunday edition of Bay Area newspapers. The insert "The Next Big Earthquake in the Bay Area May Come Sooner Than You Think" was distributed in several languages on September 9, 1990. Printed on slick bond paper using multiple colors, the 10 by 13 inch size, 24 page length contributed to the insert's magazine-like appearance. The document was divided into about a dozen topical sections. Section titles at the top of pages were printed in bold lettering for easy reference. The insert also contained maps and pictures. For example, the centerfold map of the Bay Area illustrated the location of faults and ground conditions with different prospects for shaking or failing in a large quake. The document's appearance set it apart from the rest of the newspaper. The insert told:

- that a major quake is highly likely to happen soon and why,
- how much the ground will shake,
- what people could do to prepare,
- how to reduce quake damage,
- how to respond to short-term warnings, and
- where to get more information.

III. Studying Societal Response

The objective of our research was to discover the impact of the newspaper insert on what people and organizations thought and did to get ready for the next big Bay Area earthquake. To accomplish this, we asked the questions:

- What did businesses, health, safety and welfare organizations, government agencies and citizens do to prepare for the next big Bay Area earthquake?

- Why did businesses, health, safety and welfare organizations, government agencies and citizens prepare for the next big Bay Area earthquake?

- What impact did the newspaper insert have on what people and organizations thought and did to prepare for that next quake?

- What process operated to convince people and organizations to take action?

Only after getting answers to these questions could we make recommendations about how future public information about revised earthquake probabilities could be made more effective.

Here's What We Did

During the summer of 1991, we collected background data from throughout the Bay Area. Specific community leaders were interviewed and newspaper clippings and other publicly available earthquake risk and readiness documents were collected. This information helped us to frame the questions we would ask once the study was formally underway.

General Public

Of the thirteen counties receiving the newspaper insert, eight were selected for our study of public response. Residents of these counties were exposed to a range of different risk levels as described in the insert.

- High risk counties: Contra Costa and Alameda,
- Moderate risk counties: Sonoma, San Francisco, Marin and San Mateo
- Lower risk counties: Santa Clara and Santa Cruz

Questionnaires were mailed to a random sample of households in January 1992 with two additional follow-up mailings sent to increase the number of responses. The questionnaires were available in English, Chinese and Spanish. A total of 806 usable questionnaires were returned which gave the study a 63% response rate. This is a high return rate for a mail questionnaire study.

Business

We picked 54 businesses from the same geographical area used to study public response. Businesses were divided into eight categories: retailing, development, manufacturing, transportation, finance, health, service and high technology with small, medium and large-sized businesses selected from each category. The selected businesses were not a statistically representative sample. A random selection procedure would have excluded some industry leaders and major employers. Our purposive sample guaranteed that major Bay Area corporations would be studied and also provided variation in the type and size of the business.

culture. To the best of our knowledge, this is the first time that any study on a large urban population in the United States has been able to make this conclusion.

The insert informed citizens about a dozen different items concerning the next big earthquake (see Table 1). They were most likely to remember the quake's probability of occurrence (45%), its magnitude (44%), the location where it is likely to happen (44%) and the time horizon in which it is expected (45%). Residents were also likely to recall damage information that was also an obvious lesson in the recent Loma Prieta earthquake: how damage is related to location (54%) and soft soils (45%).

The time, place, magnitude and probability of occurrence of a future quake have long been the basic elements of a prediction required by the California and National Earthquake Prediction Evaluation Councils. No prior study of earthquake forecasts has documented a public so inclined to recall prediction parameters. This finding suggested that the Bay Area public found the basic parameters of the forecast salient, perhaps because they had learned about the general aspects of quake prediction science before the insert was ever issued.

Table 2

WHAT RESPONDENTS REMEMBERED ABOUT
ACTIONS RECOMMENDED IN THE INSERT*

Recommended Actions	(n)	% Who Remembered
Store emergency equipment	(703)	87%
Stockpile food and water	(687)	85%
Strap water heater	(624)	77%
Put wrench by gas shut-off valve	(572)	71%
Bolt house to foundation	(528)	66%
Develop an earthquake plan	(504)	63%
Put latches on cabinets	(441)	55%
Store hazardous materials safely	(438)	54%
Rearrange breakable household items	(435)	54%
Look into earthquake insurance	(384)	48%
Purchase earthquake insurance	(378)	47%
Install flexible piping	(336)	42%
Pick an emergency contact person outside the area	(313)	39%
Inspect earthquake resistance of home	(311)	39%
Learn first aid	(309)	38%
Add lips to shelves	(288)	36%
Determine if live/work in vulnerable area	(258)	32%
Brace house walls	(247)	31%
Find out about school earthquake plans	(165)	26%
Learn how to put out fires	(155)	19%
Learn how to assist elderly and immobile people	(131)	16%
Learn how to rescue trapped people	(108)	13%

*Respondents could report multiple answers.

The idea that earthquakes are becoming part of Bay Area culture was further reinforced when we examined what recommended safety actions in the insert people remembered (see Table 2). Past research documents that people are most inclined to recall recommendations that are easy, quick and inexpensive to perform. But we found that people were most likely to recall recommended actions that have been circulating for a long time which the insert repeated, and less likely to recall recommendations that are relatively new ideas. For example, 87% recalled advice to store emergency equipment; 85% remembered being advised to stockpile food and water; the recommendation to strap the water heater was recollected by 77% of the population; and 66% recalled advice to bolt their house to its foundation. Relatively few people, however, recalled advice based on new ideas such as learn how to rescue people who are trapped (13%) and only 16% remembered the recommendation about assisting elderly and immobile people.

What People Did

We asked people what they had done to prepare themselves for future earthquakes both before (because of their recent experience with the 1989 Loma Prieta earthquake) and after the insert was distributed.

Table 3

MITIGATION AND PREPAREDNESS ACTIONS TAKEN BEFORE AND AFTER THE NEWSPAPER INSERT*

Mitigation/Preparedness Action	Pre-Insert		Post-Insert		Total	
	(n)		(n)		(n)	
Stored emergency equipment	(404)	50%	(248)	31%	(652)	81%
Stockpiled food and water	(357)	44%	(249)	31%	(606)	75%
Strapped water heater	(295)	37%	(122)	15%	(417)	52%
Stored hazardous materials safely	(231)	29%	(117)	15%	(348)	44%
Rearranged breakable items	(224)	28%	(143)	18%	(367)	46%
Put wrench by gas shut-off valve	(224)	28%	(127)	16%	(351)	44%
Bought earthquake insurance	(220)	27%	(103)	13%	(323)	40%
Learned first aid	(195)	24%	(66)	8%	(261)	32%
Installed flexible piping	(190)	24%	(46)	6%	(236)	30%
Picked emergency contact person	(165)	21%	(91)	11%	(256)	32%
Bolted house to foundation	(153)	19%	(40)	5%	(193)	24%
Developed earthquake plan	(148)	18%	(78)	10%	(226)	28%
Learned how to fight fires	(140)	17%	(51)	6%	(191)	23%
Put latches on cabinets	(84)	10%	(47)	6%	(131)	16%
Braced house walls	(74)	9%	(27)	3%	(101)	12%
Learned how to assist elderly/immobile	(72)	9%	(25)	3%	(97)	12%
Learned how to rescue trapped people	(49)	6%	(17)	2%	(66)	8%
Put lips on shelves	(37)	5%	(27)	3%	(64)	8%

*Respondents could report multiple answers.

Their answers provided further support for the observation that earthquakes are becoming a fixed part of Bay Area culture (see Table 3). People were most likely to report that they did things that had been recommended for a long time. For example, 81% stored emergency equipment, 75% stockpiled food and water, 44% had put a wrench by the gas shut-off valve, and 24% had bolted their house to its foundation. Only a few people had completed some of the relatively new ideas recommended in the insert such as learn how to rescue trapped people (8%).

Reported citizen mitigation and preparedness activities in the Bay Area seemed plentiful (see Table 3). Regarding mitigation, for example, 52% of our sample reported that they had strapped their water heater; 24% said they bolted their house to its foundation; and 30% said they had installed flexible piping on their gas stove lines. These are high numbers when you consider that many of these Bay Area residents live in apartments having no foundations to bolt or water heaters to strap and many cook on electric stoves. Preparedness activities that were reported were even higher. In fact, 81% stored emergency equipment; 75% stockpiled food and water; 32% had learned first aid; and 32% had picked a designated emergency contact person.

All of the mitigation and preparedness actions examined (see Table 3) had been performed by some members of the Bay Area public before the insert was distributed. But people participated in additional mitigation and preparedness activities after the insert was distributed. To illustrate this, 18% of the population had developed an earthquake plan before the insert was distributed, while 10% more did so after the insert was placed in area newspapers; 37% reported that they had strapped their water heater before insert distribution with 15% more reporting they did this after the insert's dissemination.

People listed four major reasons for not doing more to get ready for the next big Bay Area earthquake. Some 32% of our respondents reported the lack of money to do more; 30% said they were as ready as they were able to get; 25% said they simply didn't have the time to do more preparation; and 24% thought it wouldn't help to do more to get ready. But one-quarter of the population (25%) reported that they intended to learn more about what to do; 28% expressed intentions to do more to make their homes safer in an earthquake; and 11% planned on buying earthquake insurance.

The Risk People Perceived

Our respondents overwhelmingly viewed earthquakes as the most threatening hazard facing the Bay Area (80%). We measured perceived quake risk by asking people if they thought a damaging earthquake would occur in the short-term versus the long-term (see Table 4). Few people accepted the short-term risk of such an earthquake, while many admitted it in the long-term. Only 18% of the population thought that such an earthquake would occur in the next couple years, while 48% thought it would occur in five or more years; and only 10% accepted the idea of personal loss if it happened within two years, while 22% acknowledged such loss in five or more years.

As mentioned, residents of the Bay Area seem to know more about quake prediction and to be doing more to prepare for future earthquakes than any population observed

Table 4

SHORT AND LONG-TERM RISK PERCEPTIONS
OF A DAMAGING BAY AREA EARTHQUAKE

Response	In the Next Couple of Years an Earthquake:				Five or More Years From Now an Earthquake:			
	Will Occur		Will Cause Injury/ Damage to Self, Family, Home		Will Occur		Will Cause Injury/ Damage to Self, Family, Home	
	(n)		(n)		(n)		(n)	
Yes	(147)	18%	(77)	10%	(385)	48%	(176)	22%
Don't know	(545)	68%	(554)	69%	(379)	47%	(523)	65%
No	(114)	14%	(175)	22%	(42)	5%	(107)	13%
Total	(806)	100%	(806)	101%*	(806)	100%	(806)	100%

* = Due to rounding.

to date, yet few of these same citizens admitted that they faced significant losses in a big and damaging quake in the very near future. People may believe that they can control losses and injuries in future quakes by the actions they are taking now to get ready.

Other hazards threatening the Bay Area identified by residents included wildfire (7%), water contamination (4%), chemical/toxic spills (4%), severe storms (2%), radiological accidents (1%), and floods (1%). All other hazards taken together ranked less than one percent.

VI. Organizational Response

The Risk Recognized

Organizational spokespersons perceived earthquake risk in the Bay Area very differently from the general public. More than one-half of all the organizational respondents included in the study believed that the earthquake risk they faced in the short-term was high. This view was taken by 56% of businesses and corporations, 56% of the health, safety and welfare organizations and agencies in the City and County of San Francisco, 55% of the federal agencies interviewed, 50% of Santa Clara County and the City of San Jose health, safety and welfare organizations and agencies, 40% of the state agencies in the areas at risk, and 39% of the Alameda County and City of Oakland health, safety and welfare organizations and agencies.

Preparedness Actions

We asked spokespersons in the organizations studied about varied preparedness actions that enhanced preparedness for their own in-house staff or their organization's ability to perform its role as part of community response to future quake disasters.

The actions we asked about included planning, training, conducting drills and/or exercises, stockpiling emergency supplies, and informing the public about quake preparedness. The activities respondents told us about were varied in terms of how they might actually affect overall preparedness: both minor (for example, adding a few extra bottles of water to those already kept by water coolers) and major preparedness actions (for example, bringing an existing emergency plan up to the state-of-the-art) were reported.

We gathered information about preparedness activities that occurred both after the Loma Prieta earthquake, but before the distribution of the newspaper insert and after the insert's release. The lack of preparedness activity in either period does not necessarily mean that an organization is not well prepared since adequate preparedness could have been in place before the Loma Prieta quake. Additionally, the presence of preparedness activities in either time period does not mean that the organization is adequately prepared.

We found emergency preparedness actions after the Loma Prieta quake and after the distribution of the insert across all types of organizations in the Bay Area. For example, although most organizations had some sort of emergency earthquake plan in place before the Loma Prieta quake, we found a number of organizations adopted their first quake-specific plan after the earthquake and just as many adopted their first plan after the insert's distribution (see Table 5). Many of the organizations with emergency plans before the Loma Prieta quake engaged in some attempt to update them after the earthquake, after the insert was distributed and in many cases during both periods (see Table 6), but then many government agencies routinely update plans annually.

We also observed that many organizations held their first quake-related drill and/or provided some type of training to employees after the Loma Prieta quake and/or after the insert's distribution (see Table 5). For example, 19% of the businesses studied held drills for their employees for the first time after the insert was distributed, and 20% provided some type of training for their employees for the first time during the same period.

Among those organizations that held drills and/or training prior to the Loma Prieta earthquake, a marked increase was seen in the number of drills performed and attempts to provide some sort of employee training in organizations after the insert was distributed (see Table 7). Except for state agencies, an increase in stockpiling some sort of emergency supplies or adding to existing stockpiles was observed in all types of organizations (see Table 7).

First attempts by organizations to inform the public about earthquake risk and how to get ready were observed after the Loma Prieta quake as well as after the insert was disseminated (see Table 8).

Table 5

INITIAL EMERGENCY PREPAREDNESS ACTIVITIES TAKEN BY ORGANIZATION*

Organizations	(n)	Plan		Drill		Training	
		1	2	1	2	1	2
Alameda County/Oakland	(23)	19%	0%	19%	40%	10%	10%
Santa Clara County/San Jose	(22)	14%	0%	9%	73%	5%	9%
San Francisco City & County	(18)	0%	0%	11%	44%	0%	22%
Business	(54)	11%	9%	9%	32%	15%	20%
State	(14)	0%	7%	8%	46%	15%	0%
Federal	(11)	9%	18%	9%	46%	9%	0%

*Where 1 = post Loma Prieta but pre-insert and 2 = post insert.

Table 6

UPDATING EXISTING EMERGENCY PLANS BY ORGANIZATIONS*

Organizations	(n)	Plan	
		1	2
Alameda County/Oakland	(23)	24%	29%
Santa Clara County/San Jose	(22)	64%	41%
San Francisco City & County	(18)	33%	39%
Business	(54)	26%	30%
State	(14)	14%	64%
Federal	(11)	18%	36%

*Where 1 = post Loma Prieta but pre-insert and 2 = post insert.

Table 7

EMERGENCY PREPAREDNESS ACTIVITIES
TAKEN BY ORGANIZATIONS*

Organizations	(n)	Drill		Training		Stockpile	
		1	2	1	2	1	2
Alameda County/Oakland	**(23)**	**43%**	**48%**	**20%**	**20%**	**23%**	**5%**
Santa Clara County/San Jose	(22)	64%	73%	50%	63%	5%	14%
San Francisco City & County	**(18)**	**55%**	**72%**	**26%**	**38%**	**12%**	**18%**
Business	**(54)**	**43%**	**54%**	**36%**	**41%**	**15%**	**17%**
State	**(14)**	**46%**	**46%**	**47%**	**54%**	**0%**	**0%**
Federal	**(11)**	**46%**	**64%**	**27%**	**45%**	**0%**	**36%**

*Where 1 = post Loma Prieta but pre-insert and 2 = post insert.

Table 8

FIRST ATTEMPTS TO INFORM THE
PUBLIC BY ORGANIZATIONS*

Organizations	(n)	Informing the Public	
		1	2
Alameda County/Oakland	(23)	5%	5%
Santa Clara County/San Jose	(22)	5%	0%
San Francisco City & County	(18)	11%	6%
Business	(54)	6%	6%
State	(14)	14%	7%
Federal	(11)	9%	9%

*Where 1 = post Loma Prieta but pre-insert and 2 = post insert.

Mitigation Actions

Structural assessment, rehabilitation, and mitigation followed a common pattern for organizations (see Table 9). Although these activities occurred before the Loma Prieta quake in almost all organizational categories, the earthquake obviously increased the number of structural assessments performed to determine quake damage. Structural assessments after the quake were particularly frequent in Oakland/Alameda County (62%) and San Francisco (78%), where quake damage was relatively high. In some cases structural rehabilitation and mitigation followed assessments that revealed damage needing repair. Possible constraints to structural rehabilitation and mitigative actions were the availability of voter approved funds needed to engage in these sorts of activities by local government organizations.

Eight businesses and 24 of the health, safety and welfare organizations and agencies in our study had vacated a building due to the earthquake hazard. In some cases, different agencies vacated the same structure. Some of this occurred before the Loma Prieta earthquake (2 businesses, 1 state and 3 local government agencies); the rest was in response to Loma Prieta damage (see Table 9). One corporation we studied was an exception. Their headquarters in downtown San Francisco was vacated after Loma Prieta for mitigation purposes not related to experienced damage.

Actions to make sure that hazardous materials were stored safely followed their own pattern (see Table 9). Most activities to store hazardous material occurred before the Loma Prieta earthquake, likely in response to policy requiring action.

We found that purchased insurance was not a viable action for health, safety and welfare organizations and agencies because many of them in our study are government agencies (see Table 9). Only one agency in our study reported holding some type of purchased earthquake insurance. On the other hand, 23% of the businesses we interviewed had bought earthquake insurance prior to the Loma Prieta earthquake. This figure dropped by more than half after the earthquake and it remained there even after the distribution of the insert. It is possible that the level of damage experienced after Loma Prieta led some businesses to conclude that carrying purchased earthquake insurance into the future did not make good economic sense.

Finally, many mitigation actions that involve the contents of buildings do not require voter approval, changes in policy, or the outcome of structural assessments to be performed. We found that all types of organizations did more things to make the contents of their buildings safer both after the Loma Prieta quake and after the insert was distributed than they had ever done in the past (see Table 9). For example, more than half of the organizations in Oakland/Alameda County (57%) and San Jose/Santa Clara County (64%), and 47% of businesses and federal agencies did various things to building contents in order to reduce losses in future quakes. More organizations engaged in these sorts of activities after the insert's dissemination than had done so at any point before the Loma Prieta quake.

Second, the newspaper insert--particularly when reinforced by other information sources--had a strong influence on motivating readiness activities in both firms and health, safety and welfare organizations and agencies.

Third, actions to get ready for the next quake were strongly correlated with organizations searching for additional information. Firms and agencies that were already part of an earthquake-related interorganizational network drew on each other for additional information, and they were more likely to take steps to get ready as a consequence. Moreover, the presence of an organizational earthquake culture and the insert had additional indirect impacts by motivating interaction with other organizations.

Two additional findings were applicable only to health, safety and welfare organizations and agencies. A major constraint to readiness was not having the resources to act. The resource most needed to motivate readiness was having agency staff with earthquake activities as part of their jobs. The presence of people like these probably meant that the source of ideas needed to address problems raised by the revised probabilities was already in place. Finally, agencies were more inclined to ready for the next quake if the organization was perceived as vulnerable: the probability of the quake was high, it would happen soon, and the organization stood to lose things when the quake happened, for example, the ability to function, physical plant damage, and employee injuries.

VIII. Implications for Scientists and Government Officials

This study points in fruitful directions for general quake readiness activities. It also has implications for those responsible for informing the public and organizations about a future damaging earthquake. How these groups are informed is important since some procedures motivate preparedness and mitigation activities while others do not.

Work with Organizations Beforehand

Work beforehand to get organizations to network with one another regarding the quake hazard: form quake-related interorganizational working groups that meet routinely, involve representatives from organizations on advisory panels regarding earthquake policy and activities, and invent other ways for organizations to develop contacts with each other regarding the quake hazard. These networks are what businesses and other organizations turn to for information confirmation, ideas and motivation leading to increased readiness when faced with new quake risk information.

Work to help organizations free themselves of some of the constraints that keep them from acting in the face of new risk information. The lack of quake-related values, beliefs and policies as part of an organization's culture is a constraint to readiness. Moreover, organizational culture is not easily changed, and change takes time and persuasion. Work with organizational leaders to help them recognize and value earthquake hazard mitigation and preparedness activities. The

lack of resources--especially for government organizations--is another obvious constraint. The most important resources needed are local political leadership and someone in each organization with quake preparedness and mitigation as part of their job.

Written Documents are Essential

Inform the public, local government and businesses with a written document in appropriate languages. A newspaper insert works well to reach most organizations, and a direct mail brochure is much more expensive but only slightly more effective in reaching the public. The document should come from official government sources and scientists and should explain clearly and specifically:

- what the risk and probability are,
- where the quake is going to happen,
- when it is likely to happen,
- what the effects will be,
- what people should do before, during and after the quake, and
- where to get more information about it and what to do.

Some Documents are Better than Others

We learned that detailed risk maps based on geological and seismological considerations alone are not well understood by the public. Future maps could be made more user friendly to enhance public understanding. It may be helpful to code risk on maps intended for public consumption on the basis of boundaries familiar to the public, for example, political boundaries. More detailed and accurate maps could be made available to the public on request and to earthquake professionals that need more information.

The order in which information is presented in a document like the newspaper insert is important. The most important information for the public to get is what people should do, how to do it, encouragement to talk things over with others and instructions on how to get additional information. These topics should come first in the document. Earthquake science information is interesting to the public, but put it in an appendix or at the end of the document. This may be particularly important when targeting people like those in the Bay Area who are already well-aware of the earthquake hazard.

A modular approach should be used in preparing future documents since it could be easier for the public to use. Put all the information about a particular topic in the same place. For example, tell people where they can get more information about how to perform a recommended action on the same page where that action is described instead of at the end of the document.

Finally, the newspaper insert we studied was the best possible product that a team of experts from many different disciplines and backgrounds could produce. But the important discipline of public relations/technical journalism was overlooked. Use the skills from this field to package the final product when creating future public documents to ensure that the document has greater impact.

Written Documents aren't Enough

Capture the attention of organizational decision makers and members of the public, spark their interest, and get them to begin considering that they should do something to reduce their risk. People need to seek out additional information on their own, and talk with their friends and neighbors about it. Organizations need to do pretty much the same thing before they take action. This information seeking process permits both people and organizations to induce ideas about the risk they face and what they should do to get ready. People and organizations may simply need to feel that taking some protective action is their own idea. Public, corporate, health, safety and welfare organization and agency quake-readiness actions result from this process, not merely from receiving a newspaper insert or hearing scientists or officials talking in the media.

A written document must be supplemented with information that confirms the importance of the risk and the need to do something about it. People who make decisions for organizations and members of the general public need to get the message several times, from different sources and through as many different channels as possible. Go to the media with as much consistent supplemental information as you can. Also, position supplemental information in the local community for the public to use during this process, such as brochures, slide shows, coloring books, film strips, and additional advice on emergency preparedness and mitigation actions.

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Where to Get More Information

On Earthquake Prediction Science
U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

California Department of Conservation
Division of Mines and Geology
660 Bercut Drive
Sacramento, California 95814

On the Office of Emergency Services Earthquake Warning System in California
Governor's Office of Emergency Services
Sacramento Headquarters
P.O. Box 9577
Sacramento, California 95823

On the Insert "The Next Big Earthquake in the Bay Area May Come Sooner Than You Think"
U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

On the Results of This Study
Hazards Assessment Laboratory
Colorado State University
Fort Collins, Colorado 80523

On Other Publications for the Public Concerning the Earthquake Hazard
Governor's Office of Emergency Services,
Earthquake Program
Southern Region:
1110 East Green Street, Suite 300
Pasadena, California 91106

Coastal Region:
101 - 8th Street, Suite 152
Oakland, California 94607

Federal Emergency Management Agency
500 C Street, S.W.
Washington, D.C. 20472

American Red Cross
431 18th Street, N.W.
Washington, D.C. 20006