UNITED STATES OF AMERICA

NATIONAL SUMMARY REPORT

I D N D R

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SECTION A: PROFILE

1. Composition of National Committee:

Dr. Walter R. Lynn (Chairman)
Professor of Civil and Environmental Engineering, Cornell University

Mr. J. Brian Atwood
Administrator, Agency for International Development

Mr. Lawrence Grossman
President, Horizons TV

Dr. George Housner
Professor of Engineering, California Institute of Technology

Ms. Shirley Mattingly
Director of Emergency Management, City of Los Angeles

Dr. Robert Hirsch
Director, United States Geological Survey

Dr. E.L. Quarantelli
Research Professor, Disaster Research Center, University of Delaware

Dr. Kathryn Sullivan
Chief Scientist, National Oceanic and Atmospheric Administration

Mr. James Lee Witt
Director, Federal Emergency Management Agency

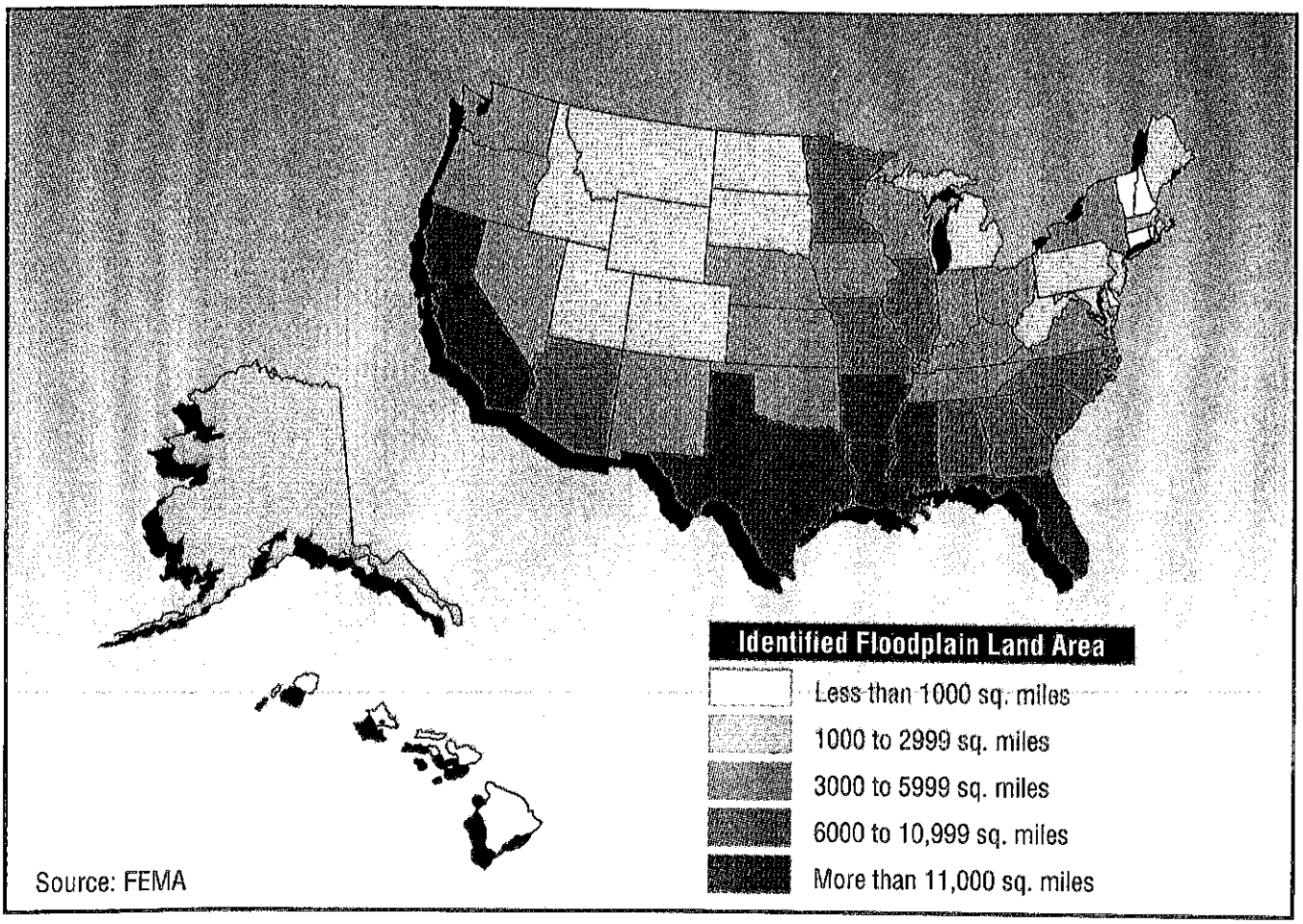
2. Internal organization of the National Committee:

The U.S. National Committee, established by the National Academy of Sciences, has nine members, made up of senior federal agency officials and other disaster experts. The membership reflects the broad national commitment to disaster reduction and to the integration of the efforts by the scientific and technological communities, the private sector, the federal agencies, voluntary sectors, and political decision-makers. The U.S. National Committee coordinates among these sectors concerned with natural disasters and promotes activities to reduce disaster impacts.

Federal disaster reduction activities are coordinated through the Subcommittee on Natural Disaster Reduction, under the Committee on Environment and Natural Resources, which is linked with the White House Office of Science and Technology Policy. The Subcommittee consists of 15 federal agencies having responsibility for research and applications programs related to natural disaster reduction, budgeted at approximately $3 billion a year. The Subcommittee coordinates federal efforts in the International Decade and works to increase the overall effectiveness of its programs.

3. Prevailing hazards:

See attached pages of *Risks and Hazards: a State-by-State Guide*, published by the Federal Emergency Management Agency.

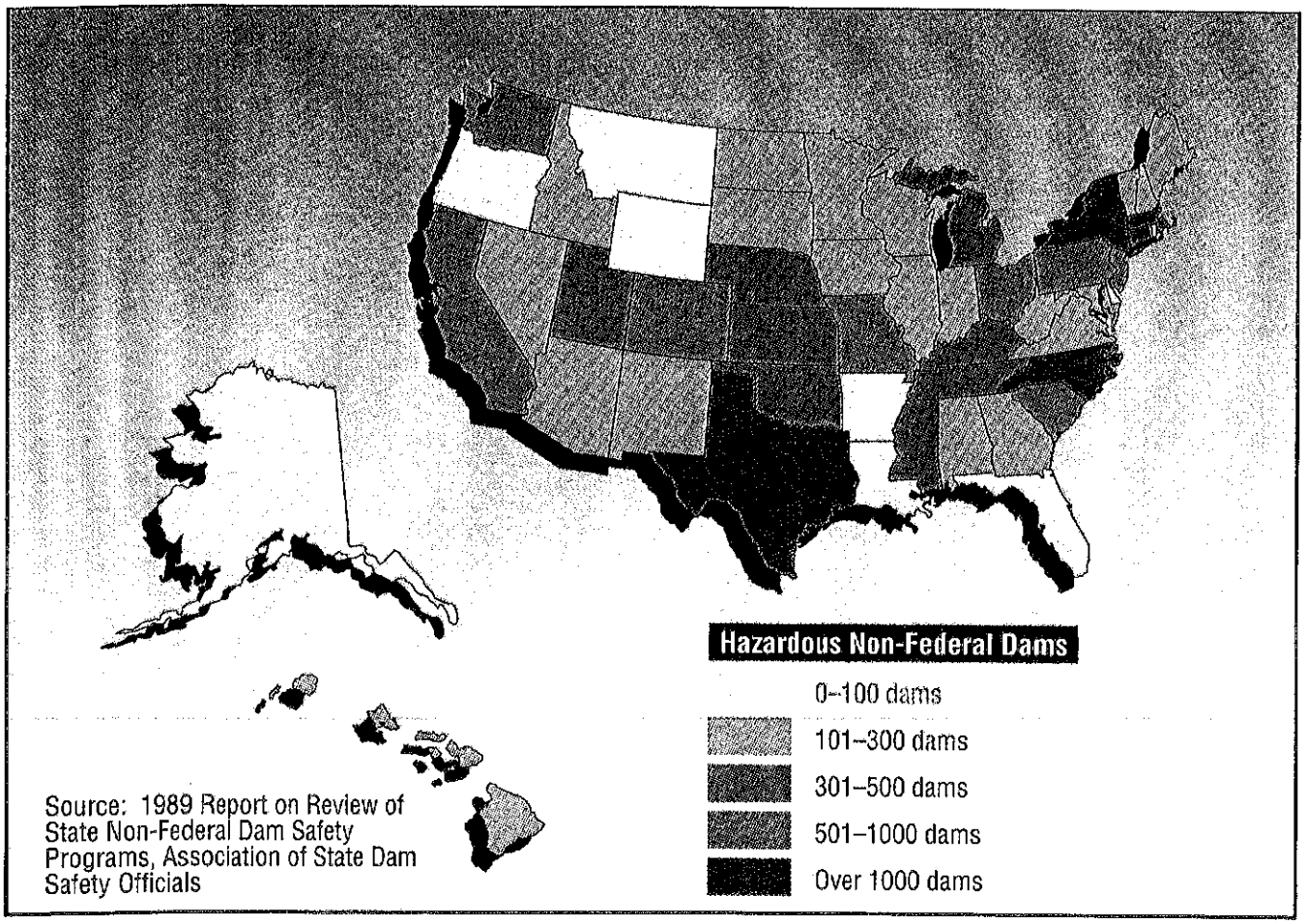


Floods

Floods are the most common and widespread of all natural hazards. Some floods develop over a period of days, but "flash floods" can result in raging waters in a matter of minutes. Even very small streams, gullies and dry streambeds that may appear harmless in dry weather can flood. *Wherever* you live—you should be aware of flooding hazards, especially if you live in a low-lying area, near water, or downstream from a dam.

In the map above, states are shaded according to how many square miles of land in each have been identified as prone to flooding, ranging from pale lavender (less than 1,000 square miles of identified flood plain) to deep purple (more than 11,000 square miles of flood plain).

Note: Because of the localized nature of flooding, this hazard is not illustrated in the state maps that follow. However, if you want more information on flood hazards, you can obtain a detailed flood-plain map of your community for a modest fee. Write to the Federal Emergency Management Agency, Flood Map Distribution Center, 6930 (A-F), San Tomas Road, Baltimore, MD 21227-6227. Or call the National Flood Insurance Program at 1-800-333-1363.

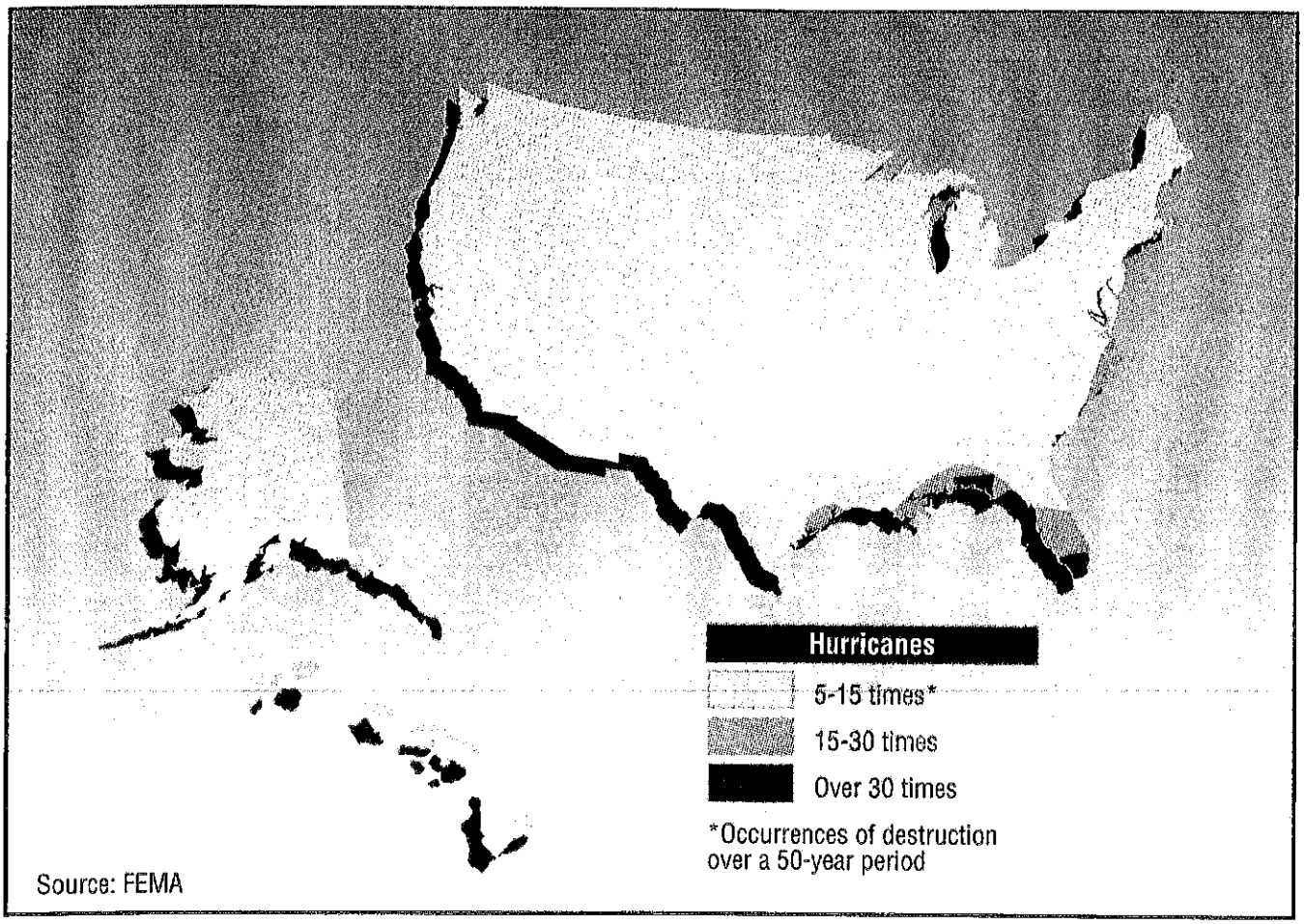


Dams

There are over 80,000 dams in the United States—and over 20,000 of them are classified as posing "high" or "significant" hazards. These designations mean that if such a dam failed, lives would be lost and extensive property damage would be suffered.

Over the years dam failures have injured or killed thousands of people, and caused billions of dollars of property damage. Dams can fail for many reasons, including internal erosion of piping; external erosion; and structural deficiencies caused by faulty construction, earthquakes or ground instability.

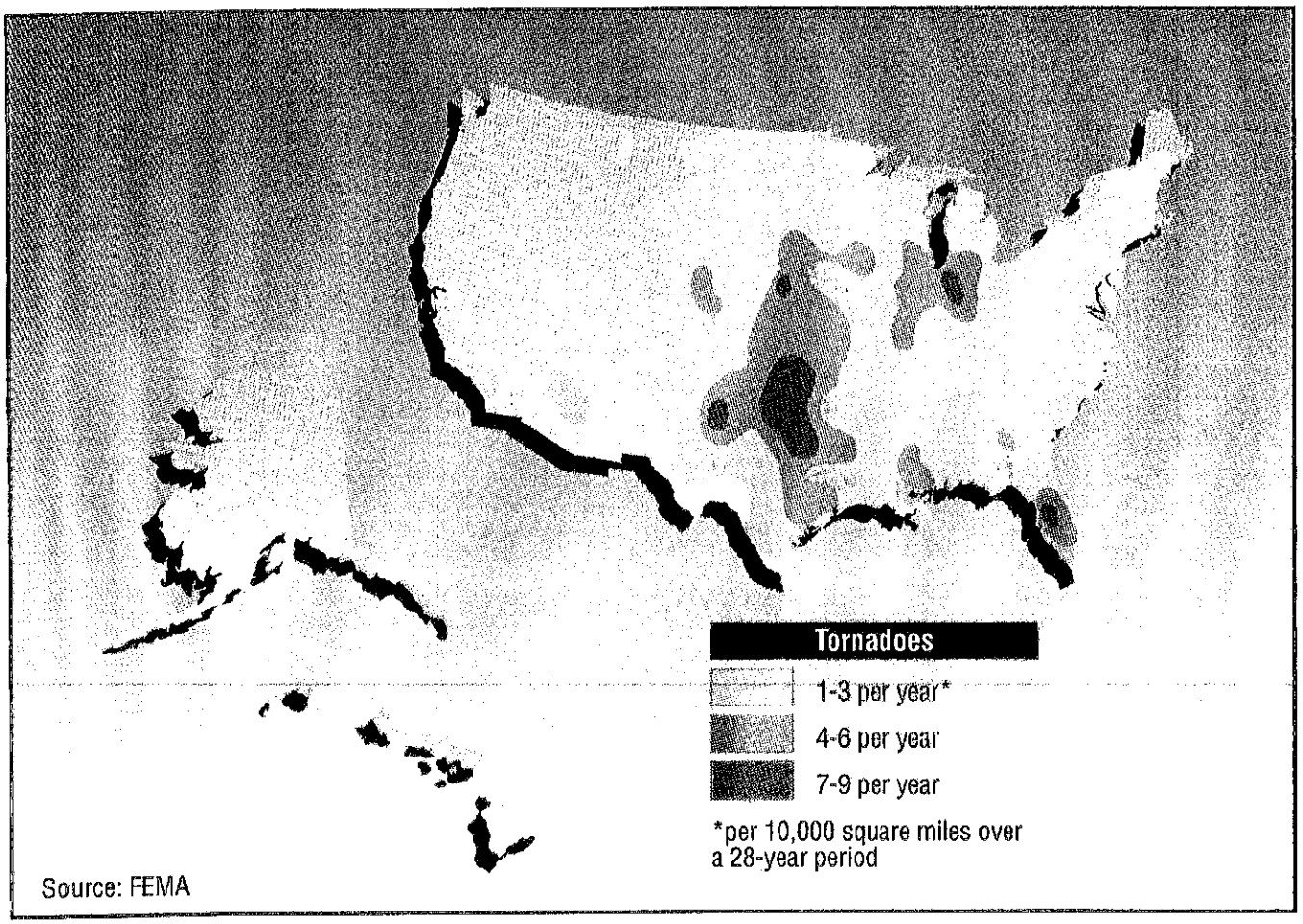
In the map above, states are shaded according to the number of hazardous non-federal dams within their borders, ranging from 100 or fewer to over 1,000.



Hurricanes

Hurricanes are severe tropical storms with heavy rains and winds which blow in a large circle around a center "eye." Hurricane winds can reach well over 100 miles per hour and create huge waves that surge across coastal areas like a giant bulldozer. Hurricanes can also produce tornadoes and cause severe flash flooding of rivers and streams. All the Atlantic and Gulf coastal states, as well as the Caribbean islands, are threatened by hurricanes. Hawaii and U.S. territorial possessions in the Pacific are also at risk to these storms. There they are known as "typhoons."

The hurricane maps in this booklet show the number of times over a 50-year period that destruction was caused by hurricanes in different areas: 5 to 15, more than 15 to 30, and more than 30.

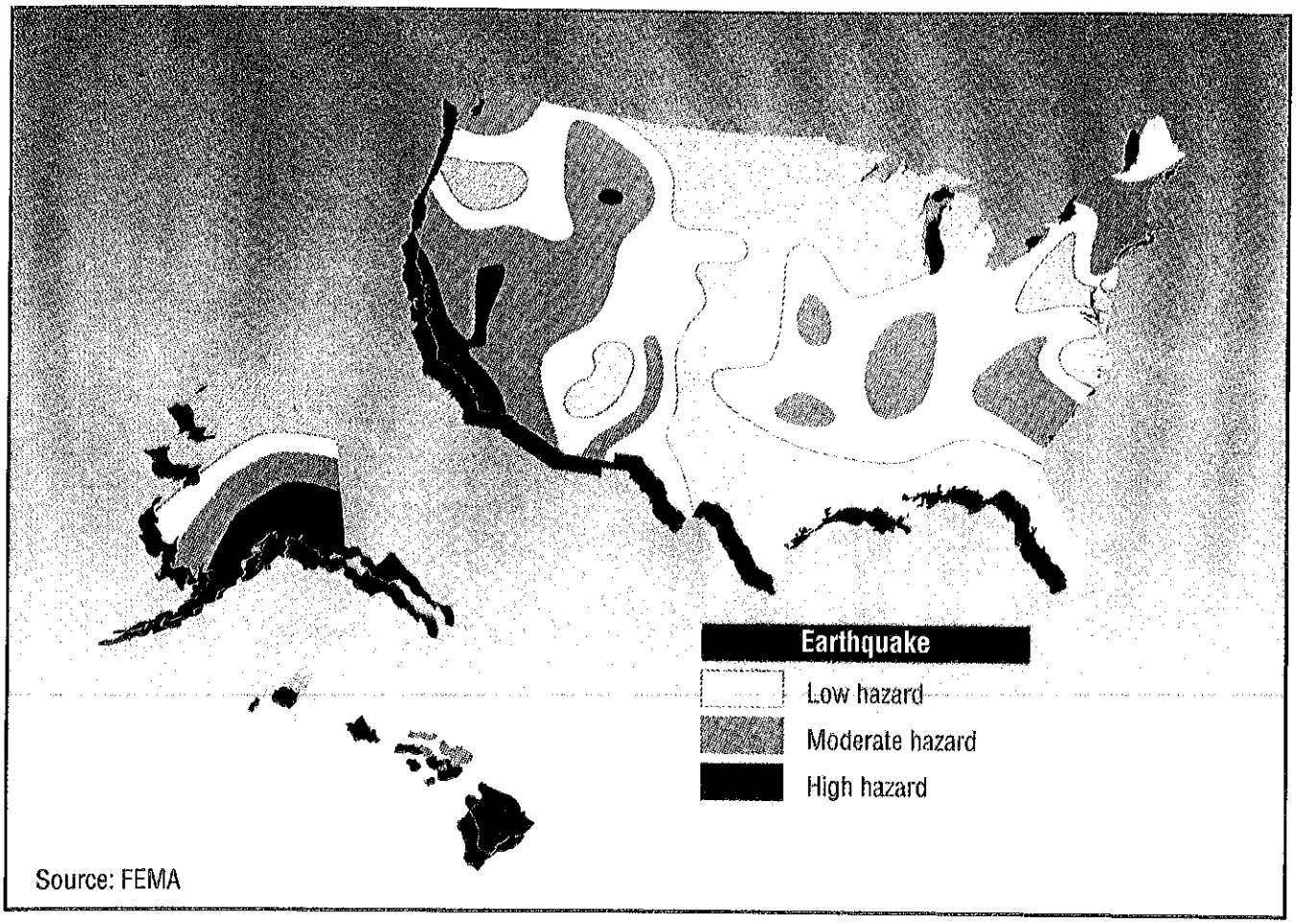


Tornadoes

Tornadoes are one of nature's most violent storms and can leave a path of devastation in a matter of seconds. They are characterized by a funnel cloud which touches the ground with whirling winds of up to 200 miles per hour or more. Although tornadoes normally travel for up to 10 miles, tornado tracks of 200 miles have been reported.

Tornadoes can strike any time of the year, but they occur most frequently during April, May and June. No state is entirely free from the threat posed by this hazard. In fact, the United States has more tornadoes than any country in the world.

The tornado maps in this booklet show the average number of tornadoes occurring each year within a 10,000 square mile area: 1 to 3 tornadoes each year, 4 to 6, and 7 to 9. Data is based on records over a 28-year period.



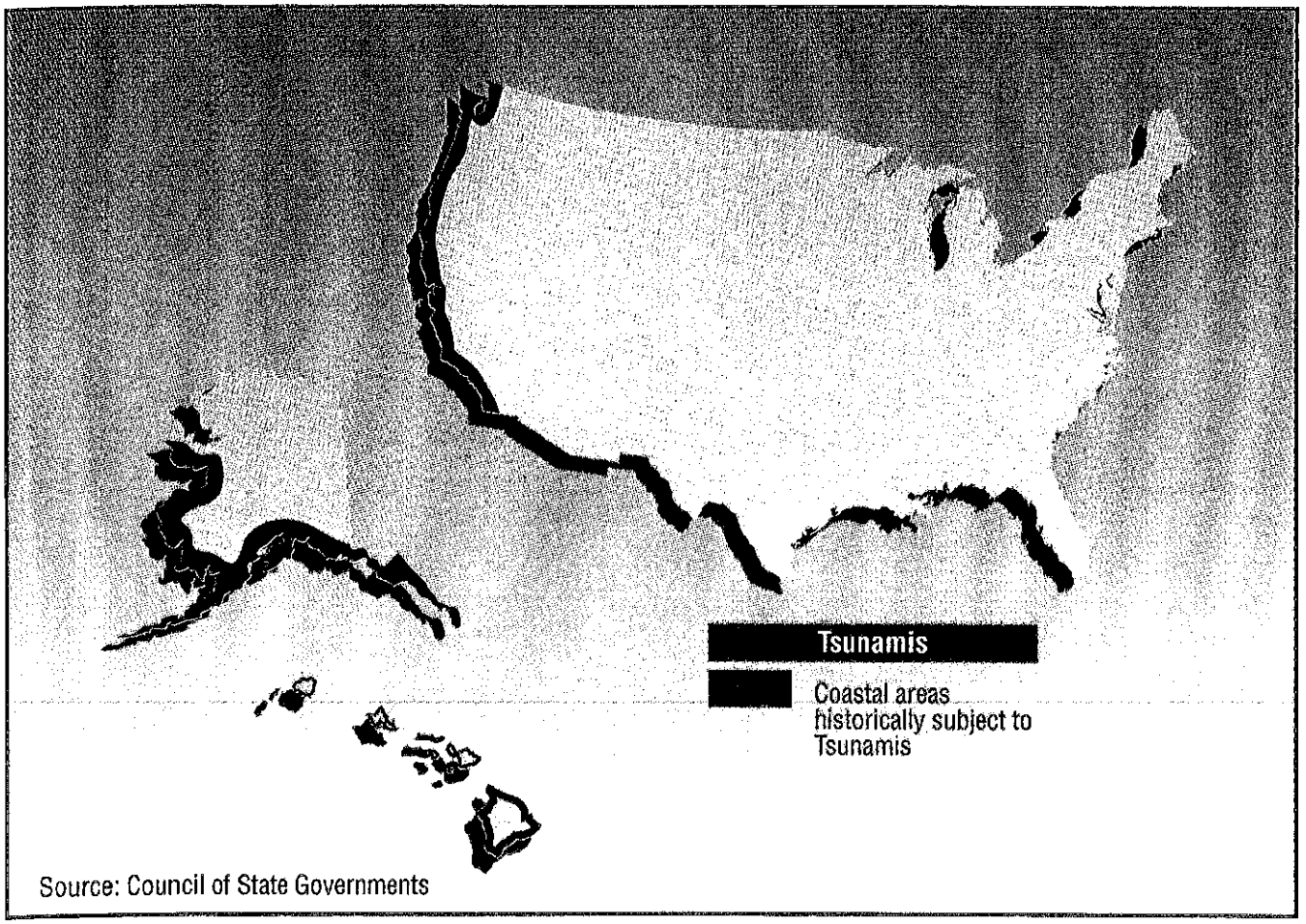
Source: FEMA

Earthquakes

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. This movement can cause buildings and bridges to collapse, disrupt utilities and result in landslides, fires and huge ocean waves (tsunamis) which can crash into coastal areas.

In the U.S., earthquakes have occurred most often in states west of the Rocky Mountains. Nevertheless, the most violent series of earthquakes occurred in the Eastern U.S. and in the Central Mississippi Valley in 1811-12, and *all* 50 states are at some risk from this hazard.

The earthquake maps in this booklet are a simplified depiction based on studies of the numbers, sizes and locations of past earthquakes, the locations of active faults, and the likelihood of future earthquakes in each region. Areas shaded in maroon represent a "High" hazard; orange, a "Moderate" hazard and cream, a "Low" hazard.



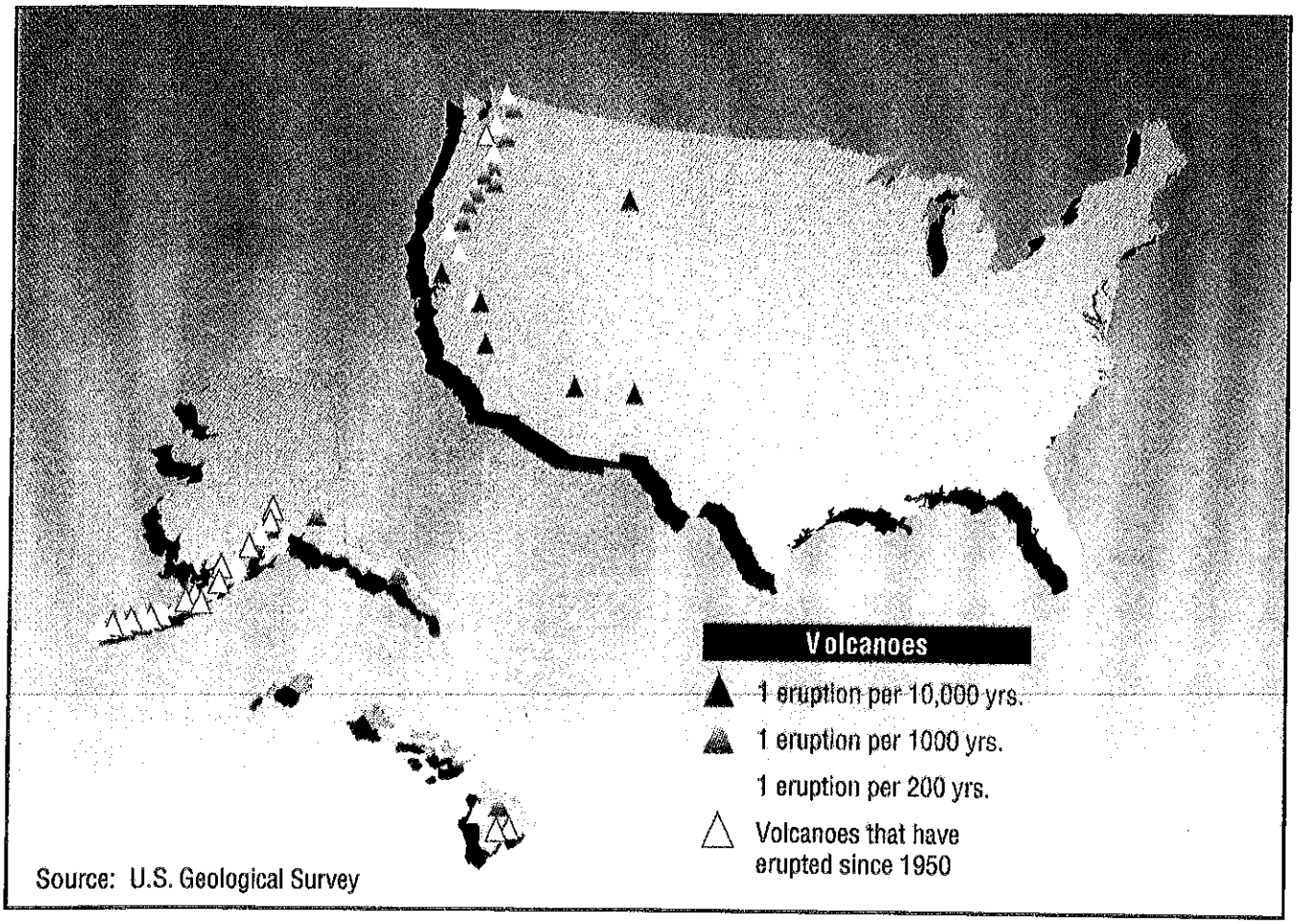
Source: Council of State Governments

Tsunamis

A tsunami (sometimes called a *tidal wave*) is actually a series of waves caused by an underwater disturbance or earthquake. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves more than 100 feet high. In this century, more than 200 tsunamis have been recorded in the Pacific.

All tsunamis are potentially dangerous, even though they may not damage every coastline they strike.

Tsunamis can occur along most of the U.S. coastline, though the most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska and Hawaii.



Volcanoes

A volcano is a vent in the earth's crust through which molten lava, hot rock and gasses erupt. Volcanic eruptions cause lava flows, mudslides, avalanches, falling ash and floods. Secondary effects include clogged sewers, blocked roads, and disruption of electrical power, water supplies and telephone service. The eruption of Washington's Mount St. Helens in 1980 killed more than 70 people and resulted in over a billion dollars in damage to property.

Active volcanoes in the United States are found mainly in Hawaii, Alaska and the Pacific Northwest. Scientists group volcanoes into three categories: volcanoes that could erupt at least once within a 200-year period (volcanoes outlined in red have erupted since 1950), volcanoes that could erupt within a 1000-year period and volcanoes that last erupted more than 10,000 years ago.

4. Recent natural hazards:

Type/Location	Affected Population/Losses
Hurricanes	
1989 Hugo-South Carolina and Virgin Islands	49 deaths; $9 billion damage
1992 Andrew-Florida and Louisiana	15 deaths; $30 billion damage
1992 Iniki-Hawaii	6 deaths; $2 billion damage
Wildfires	
1990 Santa Barbara, California	0 deaths; $235 million damage
1991 Oakland/Berkeley Hills, Calif.	25 deaths; $1.5 billion damage
1993 Southern California	3 deaths; $1 billion damage
Earthquakes	
1989 Loma Prieta, California	63 deaths; $8 billion damage
1994 Northridge, California	55 (estimated) deaths; $30 billion (estimated) damage
Floods	
1993 Midwest (Mississippi Valley)	50 deaths; $15-20 billion damage
Volcanoes	
1989 Redoubt, Alaska	1 death; less than $100 million damage
1992 Spurr, Alaska	0 deaths; $100 million damage
Landslides	
Annual Average	25 deaths; $1.5-2.5 billion damage
Tornadoes	
Annual Average	100 deaths; $1 billion damage
Drought	
Annual Average	
Winter Storm	
1994	130 (estimated) deaths

5. National socio-economic conditions:

Population:	258,233 million (U.S. Census, July 1993)
Gross-National Product (GNP):	$5,694.9 billion (1990 U.S. Census)
Per-Capita Income:	$14,420 (1990 U.S. Census)

6. Availability of assistance to other countries in the field of natural disaster reduction:

The U.S. Agency for International Development (AID) provides development assistance, including activities related to disaster mitigation. AID's Office of U.S. Foreign Disaster Assistance coordinates and assists U.S. Government response to declared disasters worldwide. Most federal agencies conduct training activities and provide technical assistance on a reimbursable basis.

SECTION B: STRATEGIES AND ACTIVITIES

1. Steps towards achieving the 3 main Decade targets

The U.S. National Committee recognizes that while mitigation has long been one part of disaster management in the U.S., it has become the principal focus of the our natural disaster reduction efforts. While mitigation means different things to individuals and to nations, it is important to call attention to the fact that in the U.S. mitigation is used in a narrower sense than the way the term is often employed elsewhere. In this report, mitigation is understood to be those measures taken before and independent from an immediate emergency situation or actual disaster. Here, mitigation activities are understood to include structural or engineering and construction measures; legislative and regulatory measures pertaining to community development and redevelopment; economic measures (including insurance and financial incentives); and educational and training measures. In many countries, in addition to these more narrowly defined activities, mitigation ofttimes is seen to encompass emergency preparedness, response and recovery.

The decentralized, diverse, and democratic U.S. society provides special challenges and difficulties in establishing and carrying out viable mitigation policies and programs. The U.S. federal (or central) government leads mostly by example and by appealing to and cajoling the diverse communities of this country to undertake activities that are rational and demonstrably increase the general welfare of its citizens.

It should not be surprising that the number of lives lost due to natural hazards has been reduced dramatically while simultaneously there has been an extraordinary growth in the amount of economic losses, including property damage, lost revenues, infrastructure and facilities, etc. In fact, the U.S. has strategically pursued an approach focused on reducing threats to human lives and personal injury, for example through greatly enhanced warning systems, but has not achieved similar benefits in terms of economic losses.

Because of the wide range of interested parties and players involved in natural disaster reduction efforts, the Committee was unable to provide a description of specific natural disaster reduction plans that are expected to be undertaken in the U.S.

for the balance of the Decade. It was not feasible to poll the private sector, the voluntary agencies, federal, state, or local governments in hopes of generating a succinct description of what is programmed for the future. As the National Committee, our aspirations for the Decade are high and our expectations great.

In preparing this report, the U.S. National Committee sought to share with the members of the world community a sense of the character, quality, and extent of the ongoing activities in the United States, which at best provide only a glimpse of the involvement and commitment of the various sectors in the Decade for Natural Disaster Reduction.

(a) Comprehensive national assessments of risks from natural hazards, with these assessments taken into account in development plans:

Risk assessment combines information on the physical hazards (e.g., frequency, intensity, location) with information on vulnerability (e.g., exposed populations, structures, critical facilities, natural resources) to determine the likely impacts of a hazardous event. It provides estimates of deaths and injuries, damage, and economic losses that are likely to result. Knowing the nature and probable impact of natural hazards is the first step for undertaking mitigation, preparedness, and warning strategies that can reduce that risk.

In the U.S., hazard-prone areas are generally known. Much has been accomplished in assessing the risks along coastlines that are vulnerable to hurricanes, flooding, and erosion, and in those floodplains that are delineated and mapped by law. Flash-flood hazards remain difficult to define and the U.S. is experiencing increasing urban and local flooding problems. National seismic risk maps have been published and substantial progress has been made in the identification of volcano and landslide risk. Procedures for identification of wildfire risk are well established.

More than half of the U.S. population lives in coastal zones and along faultlines and, independent of the hazards associated with these areas, most population growth is taking place there. In absolute terms, we simply have more population and investment at risk today than ever before. In relative terms, it is not clear whether efforts in the U.S. have kept pace with the factors that increase vulnerability: population growth and concentration in the hazard-prone areas; inappropriate building codes and land-use practices; environmental mismanagement and abuse; and aging stock of critical facilities such as hospitals, schools, bridges, and utilities.

In the past, much of what is represented as risk assessment has been, in fact, hazard assessment. We continue to improve our ability to assess hazards as witnessed by the sizable federal investment in monitoring systems. A few states, such as California and Utah, are also making significant investments in hazard monitoring and assessment. The private sector, most notably utility companies and larger industries, frequently assess the hazards they specifically face.

The assessment of vulnerability, the other element in risk assessments, has been undertaken less extensively. Federal law requires that the risks associated with critical facilities, such as nuclear power plants and federal dams, be assessed and emergency plans prepared. Similarly, inventories of vulnerable structures, such as

bridges, highways, public school buildings, and mobile homes, are frequently compiled for certain areas. Local emergency management offices and nongovernmental organizations, such as the American Red Cross, also track populations at risk. Most recently, an executive order from the President has required that all federally owned or operated buildings to be "seismically safe".

Advances in applications of computer technology, such as geographical information systems and computer models, can facilitate integration of hazard and vulnerability information to improve assessments of risk. The insurance industry, for example, models quantitative risk using historical data, statistical techniques, damage functions, expert opinion, and Monte Carlo simulation methods. While models and computing power are generally sufficient, historical and current data are often lacking.

Vulnerabilities change because of: new kinds and increasing numbers of technological accidents that can be triggered in disasters (e.g., chemical leaks in earthquakes); technological advances that add complexity to old threats (e.g., fire prevention measures in high-rise buildings that retard fires but create toxicity risks); and new versions of past dangers (e.g., urban rather than rural droughts stemming from lifeline infrastructure collapses). There are also new risks (e.g., dependency on new technologies like computers), that can magnify impacts by setting off potentially far-reaching and prolonged chain reactions of events if they fail in a disaster.

Although loss of life due to natural disasters in the U.S. has been steadily decreasing, economic losses are on the rise. Even if we were able to demonstrate that on a per capita basis or as a percent of gross national product these economic losses were decreasing, we still have ample reason to worry about the future. Past disasters are poor predictors of future ones. And, the risk of catastrophic disasters, i.e., those with society-wide impact, may actually dwarf the implications of current loss trends.

In this light, continually updated risk assessments are necessary to provide the critical information for making rational decisions about investments in effective and efficient mitigation measures, emergency preparedness, and warning systems.

(b) Mitigation plans at national and/or local levels, involving long-term prevention and preparedness and community involvement:

Mitigation in the U.S. takes place in the larger political, cultural and socio-demographic framework of the society. This often makes the initiation, implementation, and continuation of many mitigation measures difficult. Among the more important constraints operating in the U.S. are the decentralized governmental structure, diverse interests of the large private sector, prevailing cultural values, complex and changing nature of American society, and focus of natural disaster research.

Because of the structure of U.S. society there is no overall national planning or development agency, and there can be no national disaster plan per se. The governmental system is highly decentralized with the law, tradition and expectation being that disaster planning is initially and primarily a local community responsibility, except when local and even state government may be overwhelmed by a major disaster. Higher levels of government are mostly expected to provide encouragement,

guidance and certain resources for lower level planning, although federal legislation and national agency regulations can directly influence many aspects of hazard planning and disaster management.

Also, the composite of governmental jurisdictions within the U.S. makes for major overlaps as well as gaps in federal, state and local responsibilities and poses a challenge for integrated disaster planning and managing. Hazards often threaten more than one jurisdiction. Fragmentation of authority makes a rational and uniform program to manage the threat difficult.

In addition, there is a huge private sector that can only partly be directly influenced, much less controlled, by government actions. Yet, its role in planning for disasters is growing. There are many examples of major disaster mitigation investments on the part of major employers -- especially those located in high risk areas such as California. Leaders in the banking and financial sector also share their expertise and assist others to take mitigation measures. Most broadly, however, the private sector is a central participant in all efforts to institute and implement disaster mitigation in the U.S. For instance, private developers, contractors, real estate interests and the banking industry, all have a very strong concern about and influence on anything to do with housing construction and land use. All matters having to do with safely developing an area and erecting buildings -- zoning, building codes and standards, inspections, licenses, etc. -- cannot be accepted, institutionalized, and monitored well without the active cooperation of the relevant private sector groups.

There are certain cultural values and beliefs in American society which are not supportive of mitigation efforts. Deeply rooted cultural values about the importance of non-interference with respect to the use of private property, and the freedom of action are both considered major rights of the private citizen. Some segments of the population mistrust active federal and state governmental intervention in both private lives and local community life. While Americans, as a whole, believe government should protect citizens from internal and external threats, they doubt whether the government can do so efficiently.

Despite the general misgivings about governmental intervention, the state and local levels of government do implement important mitigation measures, primarily through building codes and zoning ordinances. California, which is far ahead of other states, has passed legislation that sets earthquake building standards for public schools, requires that local floodplain regulations be consistent with state standards, and regulates construction practices in zones of known seismic hazard. Elsewhere, buildings in some communities that are subject to hurricanes, for instance, have codes specifying the wind resistance necessary and detailing requirements for anchorages, fasteners, and connections to maintain structural integrity under high wind pressure.

Overall, however, low priority is given to mitigation at the community level in the U.S., reflecting the paradox that while mitigation is primarily a proactive process, many mitigating measures must be implemented at local levels where reactive stances prevail. Local political decisionmakers generally do not see the management of natural hazards as a priority, given the myriad of more pressing public policy problems such as unemployment, crime and the like. Even when building and zoning requirements have been enacted, inspection and enforcement are often weak. After Hurricane Andrew in

Florida, it was found that much of the destruction and damage to buildings stemmed from a lack of compliance with, rather than from the absence of, safety requirements.

During the remainder of the Decade, the federal agencies plan to raise mitigation as a priority in their disaster reduction programs. The Federal Emergency Management Agency, in particular, is developing a National Mitigation Strategy to be the cornerstone of the agency's activities into the next century. For the U.S., the IDNDR's call for viable and effective mitigation measures at national and local levels is the principle vehicle to ensure U.S. progress in natural disaster reduction.

(c) Ready access to global, regional, national and local warning systems and broad dissemination of warnings:

No matter how good the technology or accurate the forecasts, if warnings do not reach people when they are needed and provide information that can be acted upon, warning systems have little value. The U.S. spends billions of dollars on the maintenance and modernization of systems that detect and monitor natural hazards and provide information for forecasts and warnings that allow people to get out of harm's way. More attention needs to now be given to applying what is known about information dissemination, including decisionmaking and coordination for warnings, and the warning messages themselves.

In the last decade, important advances have been made in research in the behavioral sciences (such as constructing warning messages that people can act upon), technology (such as televisions and radios that can be automatically turned on in the event of a warning), and in the targeting of populations with special needs for the warning message (such as remote populations, elderly, non-English speakers). These advances, coupled with the major improvements in detection systems such as the Weather Modernization Program, provide a much greater capability to cope with larger and more complex disasters of the future.

Over the last 40 years, the reduction in the number of lives lost each year due to natural hazards is generally attributed to improvements in the detection and warning systems. Especially for weather disasters, these dramatic improvements are due to advances in the science and technology leading to improved satellites, radar, information processing and communications systems, better forecasting and modelling, and organization for effective warnings and evacuations. In many respects, this was demonstrated when Hurricane Andrew struck the southern part of the State of Florida in 1992: 750,000 people evacuated the area and there were only 15 disaster-related deaths. Early warning, coupled with preparation for evacuation, greatly reduced the number of deaths, even though that hurricane has become the most costly disaster in U.S. history. While surely a success story, experts point out that there was also tremendous luck involved; if Andrew had passed just a few miles north, it would have passed directly over the most densely populated and extensively developed areas of Miami and the loss of life and property are likely to have been much greater.

Communities throughout the country face unending challenges to adopt and maintain viable and effective warning systems. Both the systems and the organizational arrangements for warning must be periodically reviewed, tested, and

updated. Exposure to Hurricane Andrew and a major winter storm in March 1993 prompted Florida to embark on an improved comprehensive emergency management plan which includes an updated warning system.

Future improvements in warning systems will come from incremental refinements in coordination and cooperation among the many participants involved in formulating and communicating warning messages, and better transmission methods and strategies given new technologies, more complex hazards, and a diverse public.

2. Present national plan for natural disaster reduction:

(a) Time span covered: There is no single, comprehensive national plan; programs related to natural disaster reduction are conducted on a continuing basis by a wide variety of participants.

(b) Agencies, institutions and organizations involved: Activities are conducted by organizations in various sectors: government (national, state, regional and local levels), academia, private sector, nongovernmental organizations, professional associations, etc.

(c) Implementing agencies: Federal government agencies include - Agency for International Development: Office of Foreign Disaster Assistance; Department of Agriculture: Forest Service, Soil Conservation Service; Department of Commerce: National Institute of Standards and Technology, National Oceanic and Atmospheric Administration/National Weather Service; Department Defense: U.S. Army Corps of Engineers; Department of Energy: Federal Energy Regulatory Commission; Department of Health and Human Services: Centers for Disease Control; Department of Housing and Urban Development; Department of Interior: Bureau of Land Management, U.S. Geological Survey; Department of State; Environmental Protection Agency; Federal Emergency Management Agency; National Aeronautic and Space Administration; National Science Foundation; Office of Management and Budget; Office of Science and Technology Policy.

In addition, all states have offices dealing with emergency preparedness and response, as do many county and city governments.

(d) Funds available for implementation: Fiscal Year 1990 funds were estimated at $102.8 million for research on natural disasters and $2.663 billion for disaster reduction programs.

3. Legislation introduced and enacted in relation to natural disaster reduction:

Federal level legislation:

National Flood Insurance Program (enacted in 1968)

National Earthquake Hazards Reduction Act (enacted in 1977)

Hazard Mitigation Grant Program (enacted in 1988)

In addition, federal legislation establishes natural disaster reduction programs and their budgets through the agencies below. Similarly, many states have enacted legislation and natural disaster reduction programs.

4. Disaster mitigation activities completed or underway:

The ongoing disaster mitigation activities throughout the nation are too numerous to count. A sampling is included in the full U.S. National Report. A summary of the ongoing federal programs include:

Centers for Disease Control and Prevention (CDC) - Responds when natural disasters occur in the U.S. and, upon request, in other countries; helps state and local governments; conducts investigations into the human health effects and medical consequences of disasters; provides epidemiologic and scientific support services to other agencies involved in disaster planning and response; and recommends ways of preventing or mitigating the health consequences of any future disasters.

Federal Emergency Management Agency (FEMA) - Provides leadership and support to reduce loss of life and property and protect institutions from all types of hazards through a comprehensive, risk-based, all-hazards emergency management program of mitigation, preparedness, response, and recovery.

Federal Housing Administration (FHA) - Administers federal housing programs that increase the quality and affordability of housing to help achieve the legislative mandate of providing decent, safe, and sanitary housing in a suitable living environment for every American family.

National Institute of Standards and Technology (NIST), Building and Fire Research Laboratory - Performs research and development to improve standards and practices for buildings and lifelines to reduce loss from earthquakes, extreme winds, and fire; develops technical criteria and methods for strengthening and repairing buildings and lifelines and improving technical bases for codes and standards for new and existing buildings and lifelines; for predicting methods of behavior of fire and smoke; and for predicting performance of detection and suppression systems.

National Aeronautic and Space Administration (NASA) - Obtains information from space about the Earth in order to research processes of hazard occurrence and recurrence; to provide space-based hazard mapping, risk assessment, and hazard monitoring; and to develop information and communications systems for information dissemination and hazard mitigation.

National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS) - Describes and predicts changes in the Earth's environment, and promotes global stewardship of the world's oceans and atmosphere; develops and maintains data bases and disseminates information products on severe storms and flood warnings and weather forecasts, river flow and water resources forecasts, climate change prediction and ocean and coastal analysis and assessments.

National Science Foundation (NSF) - Promotes and advances scientific and engineering progress; sponsors and funds scientific and engineering research and education projects; supports cooperative research between the U.S. and other countries; generates the new and fundamental knowledge necessary for better understanding, managing, and mitigating natural disasters.

Office of U.S. Foreign Disaster Assistance (OFDA), Bureau of Food and Humanitarian Assistance Agency for International Development (AID) Mission - Coordinates U.S. Government response to declared disasters worldwide (both natural and man-made disasters); provides emergency assistance in the areas of shelter, water and sanitation, health, food, logistics and technical assistance; promotes disaster prevention, mitigation and preparedness through public education, emergency management training, drought and famine mitigation, locust control, shelter structural mitigation and disaster early warning systems.

U.S. Army Corps of Engineers (COE) - Manages and executes engineering, construction, and real estate programs for the U.S. Army, Air Force, other federal agencies, and foreign governments; supervises research and development; responds to natural emergencies.

U.S. Department of Energy (DOE), Office of Environment, Safety and Health - Performs research and development, and implements policies, standards, and practices to reduce effects of natural hazards on buildings, facilities with hazardous materials, and electric transmission structures.

U.S. Environmental Protection Agency (EPA) - Improves and preserves the quality of the environment, both national and global; protects human health and productivity of natural resources on which human activity depends; ensures enforcement of Federal environmental laws.

U.S. Forest Service (FS) - Provides fire protection for life, property, and natural resources; provides technical assistance in fire behavior, smoke management, fuels management, prescribed fire, fire research, infrared systems, equipment development, fire training and prevention.

U.S. Geological Survey (USGS) - Conducts research, transfers technology, and fosters the adoption and implementation of public policies and professional practices to reduce losses from earthquakes, volcanic eruptions, landslides, and hydrologic hazards in the U.S. and abroad.

5. Plans to fully implement Decade targets by the end of 1999:

In preparing this report, the U.S. National Committee sought to share with the members of the world community a sense of the character, quality, and extent of the ongoing activities in the United States, which at best provide a glimpse of the involvement and commitment of the various sectors in the Decade for Natural Disaster Reduction.

As a highly decentralized society where the federal government can lead effectively mostly by example and by appealing and cajoling the diverse communities of this country to undertake activities that are rational and demonstrably increase the general welfare of its citizens.

Because there is such a wide range of interested parties and players involved in natural disaster reduction efforts, the Committee cannot provide a description of the specific plans that are expected to be undertaken in the U.S. for the balance of the Decade. It is not feasible to poll the private sector, the voluntary agencies, federal, state, or local governments in hopes of generating a succinct description of what is programmed for the future. As the National Committee, our aspirations for the Decade are high and our expectations great.

SECTION C: INTERACTIONS

1. Publications on IDNDR-related subjects:

A paper, *Selected U.S. Resources on Hazards and Disasters*, provides a sampling of recent and readily available publications. This paper will be available for the World Conference.

U.S. publications on the IDNDR include:

Advisory Committee on the IDNDR, 1987, *Confronting Natural Disasters: An International Decade for Natural Hazard Reduction.* Washington, D.C.: National Academy Press.

Advisory Committee on the IDNDR, 1989, *Reducing Disasters' Toll: The United States Decade for Natural Disaster Reduction.* Washington, D.C.: National Academy Press.

U.S. National Committee for the Decade for Natural Disaster Reduction, 1991, *A Safer Future: Reducing the Impacts of Natural Disasters.* Washington, D.C.: National Academy Press.

Subcommittee on Natural Disaster Reduction, 1992, *Reducing the Impacts of Natural Hazards: A Strategy for the Nation.* Washington, D.C.: Office of Science and Technology Policy.

U.S. Geodynamics Committee, 1994, *Mount Rainier: A Decade Volcano*, Washington, D.C.: National Academy Press.

2. IDNDR meetings and conferences held or planned:

During the Decade, there are many meeting and conferences which have been held and are planned. They are too numerous to cite.

SECTION D: EVALUATION

1. Overall evaluation of national disaster mitigation programs including, but not limited to, those initiated after IDNDR, and achievements up to now:

Mitigation

U.S. society and government are highly decentralized and thus there are few centrally mandated mitigation standards. As a result, not all states and localities that are exposed to hazards have adopted building codes or land-use controls that would reduce their vulnerability. Recent hurricanes demonstrate that some highly vulnerable states, such as South Carolina's experience with hurricane Hugo in 1989, do not have statewide building codes to require adequate wind resistance. Dade County, Florida, had adopted effective building codes, but had not enforced them adequately to ensure that its citizens would have wind-resistant homes, as evidenced by the vast destruction wrought by hurricane Andrew in 1992.

Mitigation has been an underlying requirement of federal emergency management policy for about 30 years, beginning with floodplain management requirements in the 1960s. In actual practice, however, only a fraction of the mitigation measures known to be effective are implemented. Recently, the U.S. Congress expressed dissatisfaction with the extent to which federal, state, and local governments have undertaken various mitigating actions and has pressed the federal agencies to identify and overcome obstacles to mitigation. During the remainder of the Decade, the federal agencies plan to raise mitigation as a priority in their disaster reduction programs. The Federal Emergency Management Agency, in particular, is developing a National Mitigation Strategy to be the cornerstone of the agency's activities into the next century. For the U.S., the IDNDR call for viable and effective mitigation measures at national and local levels is the principle vehicle to ensure U.S. progress in natural disaster reduction.

Risk Assessment

Throughout the U.S., hazard-prone areas are generally known. Risk assessment, which combines information on the physical hazards with information on vulnerability to determine the likely impacts of a hazardous event, is a first step for undertaking mitigation, preparedness, and warning strategies to reduce that risk. To date, most of what is represented as risk assessment has been hazard assessment of the physical phenomena. We continue to invest in improving our ability to assess these hazards as witnessed by the sizable investment in monitoring systems at all levels. The assessment of vulnerability, the other element in risk assessments which includes identifying the exposed populations, structures, critical facilities, and natural resources, has been undertaken less extensively.

Although loss of life due to natural disasters in the U.S. has been steadily decreasing, economic losses are on the rise. Even if we were able to demonstrate that on a per capita basis or as percent of gross national product these economic losses

were decreasing, we still have reason to worry about the future. Past disasters are poor predictors of future ones. And, the risk of catastrophic disasters -- whose impact is society-wide -- may actually dwarf the meaning of the loss trends to date. In this light, new and updated risk assessments are necessary. They provide the critical information for making rational decisions about investments in effective and efficient mitigation measures, emergency preparedness, and warning systems.

Warning Systems

The U.S. spends billions of dollars on the maintenance and modernization of systems that detect and monitor natural hazards and provide information for forecasts and warnings that will enable people to move out of harm's way or be better prepared to confront these hazards. More attention needs to now be given to applying what we know about information dissemination, including decisionmaking and coordination for warnings, and the quality and effectiveness of the warning messages themselves.

Over the last 40 years, the reduction in the number of lives lost each year due to natural hazards is generally attributed to improvements in the detection and warning systems. Especially for weather disasters, these dramatic improvements are claimed to be due to advances in the science and technology leading to improved satellites, radar, information processing and communications systems, better forecasting and modelling, and organization for effective warnings and evacuations.

Communities throughout the country face unending challenges to adopt and maintain viable and effective warning systems. Both the systems and the organizational arrangements for warning must be periodically reviewed, tested, and updated. Exposure to Hurricane Andrew in August 1992 and a major storm in March 1993, has led Florida to embark on an improved comprehensive emergency management plan which includes an updated warning system.

International Cooperation

The IDNDR challenges all members of the international community providing bilateral disaster assistance to take a proactive stance to reduce the threat before disasters strike. A wide assortment of federal agencies and nongovernmental organizations are engaged in cooperative international efforts for natural disaster reduction. These programs include assistance to help disaster-prone countries in developing alert systems, mitigation capabilities, and the capacity to assess their vulnerability to natural hazards. While these are significant and important programs, they represent a small proportion of foreign assistance for disasters. For example, only between 3 and 10 percent of the Office of Foreign Disaster Assistance's budget is dedicated to prevention, mitigation, and preparedness -- precisely the areas reflected in the IDNDR goals.

The benefits of reducing the impact of disasters on each nation's capacity to achieve sustainable economic development strategies is increasingly recognized by policy makers as well as disaster and development experts. Yet, most foreign development programs do not integrate disaster reduction measures. Work is needed

to demonstrate the cost effectiveness of investments to mitigate the impacts of disasters, and to make vulnerability reduction a routine, explicit objective together with all of the other targets prescribed for development projects. Appropriate and effective intervention strategies need to be explored for disaster prevention and mitigation in the context of greater demands worldwide for humanitarian and emergency assistance. To meet the challenges posed by the IDNDR, prevention, mitigation, and preparedness must be made a priority within the overall U.S. disaster and development assistance programs. The U.S. government has pledged that in the 1990s, more emphasis will be placed on the prevention, mitigation, and preparedness activities in foreign assistance in accordance with this approach.

Summary

Much has been accomplished within the U.S. since the onset of the Decade, yet more needs to be done. It is not surprising that there appears to be no end point -- as our goals seem to move from our grasp at the same rate as we move toward them. The focus must be not only on improving understanding of these natural events and how various technologies can be developed to reduce their impacts, but even more demanding will be to devise and enact institutional mechanisms in our decentralized society that prevent or discourage individuals from placing themselves and their property in "harm's way".

In the spirit of the IDNDR which seeks to aid and support sustainable economic development, natural hazard risk assessment, mitigation and warning must be embedded in development plans and processes, otherwise the monumental efforts to improve the lives, health, and fortunes of individuals of the developing countries could come to naught.

2. Review of the IDNDR:

The IDNDR provides an opportunity to draw attention to activities that can reduce losses caused by natural hazards. In the U.S., numerous programs for this purpose existed before the Decade; nevertheless, the Decade has served as a means for increasing their visibility and for augmenting some activities.

For the latter half of the Decade, increased attention should be given to sharing information, methodologies and capabilities among countries. Partnerships between counterpart organizations in industrialized and developing countries is potentially an effective way to go about achieving this goal.