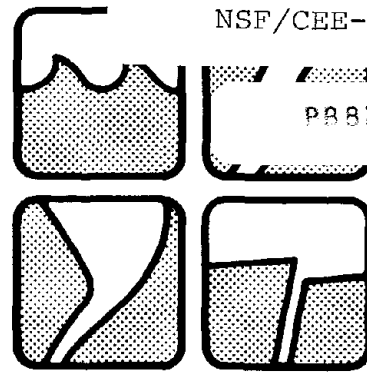


Natural Hazards OBSERVER

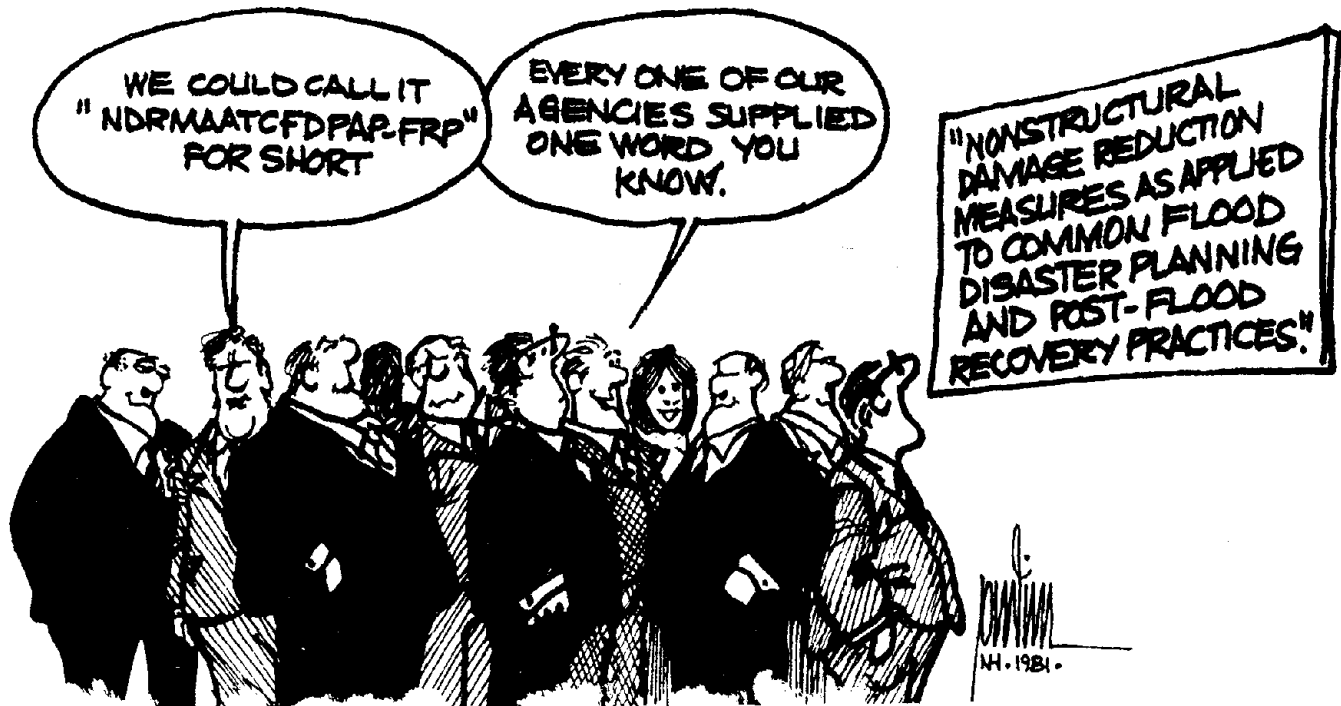


PB82-145772

VOLUME V

NUMBER 3

March, 1981



POST-FLOOD INTERAGENCY AGREEMENT

—an invited comment

Coordination among federal agencies is too often honored more in the breach than in the observance. Marvelous to relate, therefore, twelve federal departments and agencies, representing a substantial portion of the Executive Branch, on December 16, 1980, signed a detailed interagency agreement concerning post-flood recovery and hazard mitigation. This entente represents a significant achievement for the recently created Federal Emergency Management Agency which, under the direction of John W. Macy, Jr., began fulfilling its role as lead agency for disaster preparedness, response, and mitigation.

The full title of the agreement indicates its scope: "Nonstructural Damage Reduction Measures as Applied to Common Flood Disaster Planning and Post-Flood Recovery Practices." In philosophy and objectives, the agreement is consistent with Executive Order 11988 of May 24, 1977, and "A Unified National Program for Floodplain Management" issued by the U.S. Water Resources Council in September, 1979. The agreement differs from earlier policy statements, however, because it addresses the *post-disaster situation* in particular. The agreement is based on the theory that since federal agencies already spend massive sums of

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money to help individuals and communities recover from floods, mitigation objectives might be accomplished at the same time with little or no additional cost simply by redirecting these funds.

The heart of the agreement is the formation of "hazard mitigation teams" in each federal region whose composition shall be "interagency, interdisciplinary, and intergovernmental." When mobilized by the FEMA Regional Director (normally pursuant to a Presidential major disaster declaration), a team will assemble as quickly as possible at the scene of the flood to assess the extent and severity of damage and to identify opportunities for mitigating future losses through relocation, floodproofing, land use controls, public acquisition and other means. Within 15 days the team will submit a "hazard mitigation report" recommending specific governmental actions and policies.

This tight schedule is intended to provide public authorities with specific guidance in the allocation of technical and monetary assistance *before* long-term recovery decisions are made. (No moratorium on federal benefits pending the hazard mitigation report is anticipated: it normally takes a couple of weeks to process claims and applications for assistance other than emergency relief.) The short-term hazard mitigation report is expected to complement the longer term "hazard mitigation plan" required under Section 406 of the Disaster Relief Act of 1974 (P.L. 93-288).

The genesis of the agreement is an interesting study in the operation of the Executive Branch. In his water policy statement of April 18, 1977, and a subsequent memorandum to certain agency heads on July 12, 1978, President Carter called for increased reliance upon the use of nonstructural measures for flood hazard mitigation. In early 1979, the President's Water Policy Committee, an informal colloquium of water-related agencies at the Assistant Secretary level, asked the Water Resources Council to obtain consultant reports on specific options to implement this policy. The reports were published by the WRC in late 1979 as *Impediments to Federal Sponsorship of Nonstructural Floodplain Management and Flood Recovery Measures* (see *Observer*, Vol. IV, No. 2, p. 2); one report, drawing on case histories of several floods, recommended adoption of an interagency agreement and the formation of hazard mitigation teams.

The next step was an "off the record" meeting organized by FEMA at the National Academy of Sciences, April 3, 1980, where representatives of all agencies involved in post-flood recovery candidly discussed ways and means of coordinating their efforts. An encouraging consensus was reached favoring several of the recommendations of the WRC consultants.

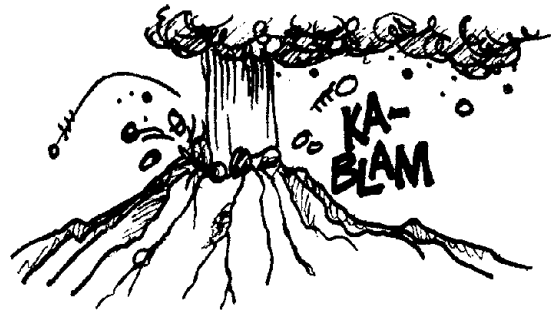
Finally, on July 10, 1980, the Office of Management and Budget issued a directive which ordered the formation of an interagency task force, execution of an interagency agreement within 120 days, and formation of regional hazard mitigation teams within 90 days thereafter. The agencies have worked diligently to carry out this mandate; it is hoped that the effort will continue under the new administration.

Rutherford H. Platt
University of Massachusetts

KRAKATOA REMEMBERED

The tiny volcano that slumbered in the Sunda Strait between Java and Sumatra erupted on the evening of August 27, 1883, and shook the world. The explosion was heard in Australia, it generated seismic sea waves that traveled as far as Europe, and the ash circled the globe for many years. To commemorate the 100th anniversary of Mount Krakatoa's eruption, the Indonesian Institute of Sciences will launch two years of scientific activities in August of 1981. Expeditions to, and research on Mount Anak Krakatoa, the volcano born in 1927 on the site of the obliterated mountain, will commence then and culminate in a symposium in August, 1983. The following fields have been selected to be covered in papers prepared for the meeting: volcanology, geology, geophysics, oceanography, marine and terrestrial biology, ecology, and the historical aspects of Krakatoa's eruption.

Interested individuals and institutions are invited to participate in all phases of the commemoration. Obtain more information from *Committee of the 100th Anniversary of Mount Krakatau, Lembaga Ilmu Pengetahuan Indonesia (LIPI), Jl. Teuku Chik Ditiro 43, Jakarta, Indonesia.*



TSUNAMI INFORMATION

To encourage research on the potentially catastrophic tsunami, the National Geophysical and Solar-Terrestrial Data Center (NGSDC) has compiled a set of data bases pertinent to the understanding of that phenomenon. Located in Boulder, Colorado, the NGSDC is operated by the National Oceanic and Atmospheric Administration, under the Environmental Data and Information Service.

The available data include digital and analog seismograms from a world-wide network, and indication of epicenter, magnitude and focal mechanisms; mareographic information from tide records; digital bathymetric figures; and reports on tsunami effects as well as a photographic file. The Center has published catalogs on tsunamis in Alaska and Hawaii. It also operates a modest guest worker program and can provide space, access to computers, digitizers, plotters, data files, and some financial help to researchers. Data can be obtained at the cost of copying, or in exchange to scientists depositing records in the Center.

For further information, contact *Patricia Lockridge, NOAA, EDIS/NGSDC, D622, 325 Broadway, Boulder, CO 80303, (303) 499-1000.*

PEAK FLOOD FLOWS IN SAN DIEGO'S
MISSION VALLEY, 1978-1980

An Open Letter from
Philip R. Pryde, Ph.D.
Department of Geography,
San Diego State University

The San Diego River floods of 1978, 1979, and 1980 impressed the citizens of San Diego in many ways. One of the most evident of these was the obvious effect of urbanization on downstream run-off patterns. So great was the increase in maximum Q in Mission Valley, as compared to a few miles upstream, that one must ask if these effects are perhaps not underestimated.

In 1976, the Corps of Engineers re-calculated flood frequencies on the lower San Diego River, and determined the 50-year flood size to be 17,000 cfs. Within the last three years, this figure has been closely approached or exceeded four times. The Corps considered the effects of expected basin urbanization in deriving its figures, but considering that almost all of this flooding was produced by storms of recurrence intervals much less than the corresponding flood recurrence intervals, it seems reasonable to ask whether the accepted discharge-frequency curves showing the effects of basin urbanization may not, in fact, understate reality. In 1979, for example, 15 to 25 year 24-hour precipitation in La Mesa and East San Diego produced a 50-year flood in Mission Valley.

Storm and Run-Off Data for Mission Valley Floods of 1978-1980

Flood Date	Mission Valley	Mission Gorge	SDSU Climatic Storm(s)*		
			24 hr.	48 hr.	Prev. Week
1-15-78	15,000 cfs	3,010 cfs	2.34"	2.94"	4.38"
3- 1-78	14,000 cfs	2,480 cfs	1.21	1.81	2.82
1-31-79	17,000 cfs	gauge not working	3.30#	3.56	3.65
2-21-80	27,000 cfs	gauge not working	1.65	2.16	4.82

*Gauge is 6 mi. upstream from Mission Valley. SDSU 100-yr 24 hr. storm = ca. 5"
#24 hour precip. was 4.25" in La Mesa (3 miles east of San Diego State Univ.), which = a 25-year storm.

Viewed another way, the earlier large floods on the San Diego River (e.g., 1916) were estimated to be less than 10% larger in Mission Valley than at the official

gauging station in Mission Gorge. However, the 1978-1980 flows were as much as 500% larger, and surprised almost everyone by their magnitude. Further, at no time did spillage from upstream dams account for more than a small fraction of the Mission Valley flow (El Capitan Dam was not overflowing at the time of any of these peak flows). Additionally, the lower basin is still a long way from being at a stage of maximum development.

In light of the above, it would seem appropriate to inquire if another look at the existing assumptions about the effects of urbanization on downstream flood run-off is not in order. The San Diego experience of the last three years would seem to suggest that these effects might be greater than generally assumed.



SURVIVAL SKILLS

Two new books on disaster preparedness and survival offer suggestions to increase everyone's chances of coming through a disaster, whatever it may be.

Just In Case, by John Moir, is a concise, paperback manual intended to help individuals and families prepare themselves and their homes for natural and technological disasters. Simple step-by-step instructions are included on how to store food and water, equip home and car with emergency supplies, evacuate a threatened area, make an emergency phone call, shut off utilities, and perform basic first aid. Short descriptions are given of each of the risks examined, explaining to the reader what should be expected in the way of warning, property damage, injuries, assistance from local emergency services, and aftereffects. The manual is available from *Chronicle Books, 870 Market Street,*

Suite 915, San Francisco, CA 94102, (415) 777-7240. 245 pp. \$4.95.

Disaster Survival, by H. McKinley Conway, provides information to industrial and commercial leaders for evaluating a potential business location for its susceptibility to natural and technological disasters. Over 200 maps, charts and photographs aid in the comparison of risk potential in each of the states. Additionally, the book discusses model survival plans for households and businesses, emphasizing preparedness planning, evacuation and relocation, protection of key personnel, records storage, computer security, and planning the new residence or facility with future survival in mind. Included are a chapter on government disaster policies, an appendix listing international disaster risk data, and a summary of federal assistance programs. Order from *Conway Publications, Inc., 1954 Airport Road, N.W., Atlanta, GA 30341, (404) 458-6026. 278 pp. \$48.00.*

WASHINGTON UPDATE

STATE ASSISTANCE PROGRAM

The Federal Insurance Administration issued the final rule for the operation of the State Assistance Program on November 28, 1980. Designed to provide states with the opportunity to strengthen their roles in flood hazard mitigation activities of the National Flood Insurance Program, the State Assistance Program allows each state to accommodate the unique characteristics of its communities in developing and implementing approaches to mitigation. Increased state involvement in NFIP coordination helps ensure appropriate flood plain management standards at the local level, and more efficient use of federal resources.

Each state is provided a target funding figure, determined by the magnitude of lives and property at risk to flood hazards and historical flood damages. The state then applies for the funds by indicating the new or expanded activities it will undertake. The activities fall into three categories: assessment of current state and local mitigation programs; general assistance and public information, providing for the development of state-wide information and coordination networks; and community services which allow states to work closely with communities to administer and implement mitigation programs.

Operating under the interim rule, FIA awarded in September one-year contracts for participation in the State Assistance Program to 48 states. For further information, contact *Richard W. Krimm, FEMA/FIA, 451 7th Street, S.W., Washington, DC 20410, (202) 755-5581.*

NOAA COASTAL PROGRAM

The National Oceanic and Atmospheric Administration Coastal Hazards Program Development Plan has been approved by the Assistant Administrators for Coastal Zone Management, Research Development and Oceanic Atmospheric Services. The plan, which was developed in response to the threat of hurricanes, severe storms, tornadoes, flooding, erosion and subsidence along the coastal regions of the United States, will help achieve one goal of the national coastal protection policy announced in the President's August 2, 1979, Environmental Message to Congress—"to manage coastal development to minimize loss of life and property from floods, erosion, saltwater intrusion and subsidence."

The program will coordinate federal grants, basic environmental data, technical information, land use management techniques, and local expertise so that each

of 39 coastal regions will be able to develop its own hazard management plan to fit its specific problems. Such NOAA programs as technical leadership, environmental data and financial assistance will be modified or enlarged under the plan in direct response to the needs of the individual regions. New projects will provide products and services not now available.

A Coastal Hazards Office has been formally established and will be housed in *Suite 204, Building L, 6001 Executive Boulevard, Rockville, MD 20852, (301) 443-8860.*

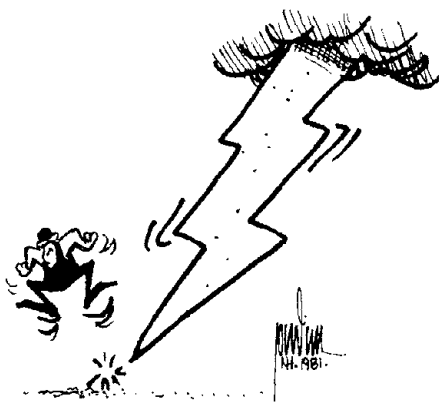
INTERAGENCY AGREEMENT SIGNED

The twelve federal departments and agencies which have responsibility for disaster response have entered into a formal interagency agreement which defines a common flood disaster planning and recovery policy, and provides that nonstructural measures for flood hazard mitigation are to be used whenever practicable. The agreement came in response to the July 10, 1980, memorandum from the Director of the Office of Management and Budget (OMB) which directed, "all federal programs that provide construction funds and long-term recovery assistance must use common flood disaster planning and post-flood recovery practices" in order to minimize both flood losses and federal expenditures for recovery and relief.

Some of the elements of the policy set forth in the agreement are to encourage wise use of flood plains; base policies and practices on guidelines set forth in Executive Orders 11988 and 11990; consider alternatives to locating facilities in flood plains, including relocation, floodproofing and taking no action at all; and cooperate to achieve coordinated hazard mitigation during the recovery period after a flood.

The agreement also established an interagency task force which will work with states and local governments to avoid future flood losses and to facilitate recovery activities. The task force will be assisted in this responsibility by hazard mitigation teams which will report on local mitigation efforts as requested and make recommendations for federal and local actions to mitigate the flood hazard after disastrous floods.

Parties to the agreement are the Federal Emergency Management Agency, Department of Agriculture, Department of the Army, Department of Commerce, Department of Health and Human Services, Department of Education, Department of Housing and Urban Development, Department of the Interior, Department of Transportation, the Environmental Protection Agency, the Small Business Administration, and the Tennessee Valley Authority.



BOLTS FROM THE BLUE

For the most recent 20-year period, 15% of the recorded lightning victims in the U.S. were taking cover under trees, according to the National Oceanic and Atmospheric Administration. Another 12% of the fatalities is made up by people boating, fishing or swimming. From 1959 to 1979, 2,210 deaths were due to lightning; Florida had the most of any state with 223. The National Climatic Center has available a magnetic tape with date/time, location, number of injuries, and amount of property damage for each of the 14,000 reported lightning strikes in the last two decades. Contact Henry N. Vigansky, National Climatic Center, NOAA, Federal Building, Asheville, NC 28801, (704) 258-2850, x366.

ST. HELENS AND THE ECONOMY

Although the agriculture, timber production, and tourism industries suffered severe immediate losses from the eruptions of Mt. St. Helens, the long-term economic impact on the Pacific Northwest will be minimal, according to three separate assessments released recently. Each of the eruption's three physical effects—mudflows, pyroclastic blast, and ash fallout—had economic consequences: the blast knocked down 120,000 acres of trees; the mudflows destroyed roads and bridges, blocked the Columbia and Cowlitz Rivers, and killed fish; and the ash lay waste to crops and closed down businesses for varying lengths of time.

The report by the United States International Trade Commission, *The Economic Effects of the Eruptions of Mt. St. Helens*, prepared for the Committee on Ways and Means of the House of Representatives, indicates a possible slight reduction in agricultural exports as one of the few effects on international trade. It estimates direct costs of \$1.2 billion for the affected area, with the following distribution: timber and related losses—\$695 million; agricultural losses—\$192 million; damage to roads and bridges—\$112 million; fishery losses—\$95 million; ash cleanup—\$75 million; and dredging the Columbia—\$44 million. However, six short topical reports by Seattle's Rainier Bank indicate the cost may be on the order of \$1.5 billion if other near-term costs, such as the dredging of the Cowlitz or repairing of

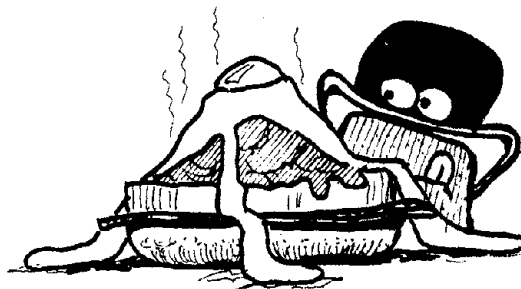
municipal water and sewage facilities, are included. The appropriation by the federal government to compensate for losses and cleanup costs was \$951 million.

Economic Impact of Mt. St. Helens, a white paper on the long-term effects of the eruptions completed by an *ad hoc* group of economists in the Pacific Northwest, finds that the rate of economic growth in the region may be altered, but, if the mountain's activities subside, the alteration will be a positive one. For instance, the tourist industry has survived the dearth in visitors subsequent to the May 18th eruption, and is already claiming the volcano as an asset. The paper predicts that the intrinsic advantages of the Pacific Northwest will outweigh the risk of an infrequent disaster and there will be no lessening in development and investment there.

Reports #1-6 of *The Economic Impacts of the Eruptions of Mount St. Helens* are available at no cost from the Rainier National Bank, Economics Department, One Rainier Square, P.O. Box 3966, Seattle, WA 98124. *Economic Impact of Mount St. Helens* can be obtained from the Natural Hazards Information Center at the cost of copying (\$1.00 est.). Address all communications about *The Economic Effects of the Eruptions of Mt. St. Helens* to Office of the Secretary, United States International Trade Commission, Washington, DC 20436.

MAY BE HAZARDOUS TO YOUR HEALTH

Among the negative consequences of Mount St. Helens' eruptions, a new sandwich was one of the least expected. The "St. Helens Sunnyside Special" was nominated by the Wheat Flour Institute as the top sandwich of 1980; shortly thereafter it was picked as one of the year's worst recipes by Knight-Ridder Newspapers. Intended to look like an erupting volcano, this gastronomic pyroclastic flow can be whipped up by anyone with only a modicum of culinary ability. On one-half of a toasted English muffin place a slice of cooked Canadian bacon. Top that with a pineapple ring and spoon orange marmalade into the hole of the pineapple. Beat an egg white until stiff and spread it over the top and sides of the sandwich. Set the concoction on a baking sheet, sprinkle on a tablespoon of grated cheddar cheese, and perch the egg yolk on the tippy-top. Bake it 12-17 minutes in a 375° oven until lightly browned. Serve it immediately (or don't serve it at all).





GRANTS

Geologic hazards from coal mining. "Concepts for Protection Against Catastrophic Events from Coal Mining," Office of Surface Mining, U.S. Department of the Interior, \$59,498, 28 weeks. Project manager: *Ronald W. Stingelin, Resource Technologies Corporation, P.O. Box 242, State College, PA 16801, (814) 238-4880.*

The project will assess methods by which government agencies and private industry might cope with hazards such as subsidence, landslides or flooding which may occur at a site many years after coal mining and reclamation operations have taken place. The project will examine the range of adjustments to natural and technological hazards used today—insurance, land use planning, public awareness, legislation, bonding—and evaluate the success of each technique as applied to each hazard. The final report will indicate which types of adjustments are most likely to be successful in coping with future coal mining hazards.

Disaster assistance information. "Disaster Assistance Information Management," Agency for International Development, Office of Foreign Disaster Assistance, \$247,468, Project extension for 12 months. Project manager: *Lucy S. Drobot, Evaluation Technologies Incorporated, 2020 North 14th Street, Suite 620, Arlington, VA 22201, (703) 525-5818.*

This project expands on a system of data bases produced since 1976 for the Office of U.S. Foreign Disaster Assistance. The system is designed to provide OFDA with baseline demographic, economic, geographic and sociopolitical data for the world's most disaster-prone countries; and with a world-wide history of natural disasters since 1900, placing particular emphasis on U.S.-assisted disasters since 1965. In addition to revising those two data bases, the project will design and produce three new ones: a record of the commodities provided by AID for disaster relief; summaries of disasters for which OFDA provided assistance, with breakdowns of other bilateral and international assistance; and special reports of conferences and regional disaster assistance activities, as well as lists of disaster assistance specialists.

Tsunami risk. "Pacific Region Tsunami Threat Analysis," Agency for International Development, Office of Foreign Disaster Assistance, \$30,090, 5 months. Principal Investigator: *Gerald T. Hebenstreit, Ocean Physics Division, Science Applications, Inc., 1710 Goodridge Drive, P.O. Box 1303, McLean, VA 22102, (703) 821-4300.*

The project will examine several locations on the coasts of Peru and Chile to estimate the potential for tsunami generation should large earthquakes occur there. Working with seismologists to assess seismic potential in the areas, the researchers will also use historical evidence to build scenarios of the types of earthquakes most likely to happen. From those will result possible bottom displacement patterns and a numerical tsunami model. The simulation of surface wave generation and propagation will enable the determination of the types and degrees of tsunamis possible in the region.

Seismic safety policy. "Seismic Safety and Public Policy Processes: A Study of Three Jurisdictions in San Bernardino County, California," National Science Foundation, \$194,102, 24 months. Co-principal Investigators: *Richard S. Olson and Douglas C. Nilson, Department of Political Science, University of Redlands, Redlands, CA 92373, (714) 793-2121.*

The study will attempt to isolate those factors which facilitate or impede the initiation, adoption and implementation of measures to improve local seismic safety. Public documents, newspapers, and interviews with community decision makers and observers from San Bernardino, Redlands, and San Bernardino County will provide information on how seismic safety issues were treated by those three governments between 1968 and 1978. The result of the research will be an analysis of the relationship between the types of issues which arose during that period, the social, economic and political influences operating in the area, and the resulting policies adopted by the local governments.

Training for local officials. "Long-term Recovery from Coastal Flooding: A Training Program for Local Officials," Federal Emergency Management Agency, \$60,000, 7 months. Project director: *Claire B. Rubin, Academy for Contemporary Problems, 400 North Capitol Street, N.W., Suite 390, Washington, DC 20001, (202) 638-1445.*

Based upon a similar program for riverine flooding successfully tested in 1980 (see *Observer*, Vol. IV, No. 3, p. 7), the coastal recovery training program will feature a practical exercise in disaster recovery decision making which will allow key local elected and administrative officials, department heads, and emergency management coordinators to identify the requirements of their areas and plan appropriate recovery activities. The training materials will focus on coastal high hazard analysis, applicable federal regulations, obtaining federal funding, planning realistic flood control procedures, and managing recovery funds.

Earthquake prediction. "A Search for Correlations between Changes in Activity Patterns of Burrowing Rodents and Subsequent Seismic Events," U.S. Geological Survey, Office of Earthquake Studies, \$60,053, Project extension for 12 months. Principal Investigators: *R. G. Lindberg and D. D. Skiles, Institute of Geophysics, University of California, 405 Hilgard, Los Angeles, CA 90024, (213) 825-2803.*

The project monitors automatically the activities and responses of captive animals. After any significant earthquake, investigations are made into anomalous behaviors that preceded the quake. The research began in late 1978.

Science and Technology. "The Role of Science and Technology in Emergency Management," Federal Emergency Management Agency, Mitigation and Research, \$225,000, 14 months. Project administrator: *Charles E. Fritz, Commission on Sociotechnical Systems, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418, (202) 389-6470.*

Approximately ten representatives from state and local government, the research community and the fields of emergency management and hazard mitigation will form a committee which, with support from professional staff and consultants, will assess the role of science and technology in the emergency management system. The committee will examine the potential for more significant contribution to emergency management by scientific and technological resources; describe methods by which FEMA might incorporate more science and technology into its programs; and review possible approaches to be used by FEMA in providing knowledge and technical assistance to public and private institutions. The project will develop specific guidelines and recommendations for improving the application of science and technology to emergency management problems and for developing communication among research sponsors, producers and users.

COMING CALIFORNIA CATASTROPHE

The United States is unprepared for the catastrophic earthquake that is more than 50% likely to strike California during the next three decades. This was the conclusion of a study conducted by an *ad hoc* committee of the National Security Council, assisted by other federal agencies. The NSC committee, which was organized in response to President Carter's concern about disaster preparedness after viewing the destruction caused by the eruption of Mt. St. Helens, found that current preparedness and response plans are probably adequate for moderate earthquakes, but that a very large one will present the state and nation with damages, casualties, and social and economic impacts unparalleled in magnitude since the Civil War.

In the committee's report, *An Assessment of the Consequences and Preparations for a Catastrophic California Earthquake: Findings and Actions Taken*, an analysis of the disaster readiness of local governments and state and federal agencies reveals that response to such a great earthquake would be disorganized and largely ineffective. The plans of different governmental units, levels and jurisdictions have not been coordinated. In addition, the possibility of a prediction has not been incorporated into the plans, long-term recovery issues have not been considered, and communication problems would be formidable.

As the agency responsible for providing management and coordination needed to strengthen federal planning and preparedness, FEMA has recently entered into a cooperative effort with the State of California and local governments to draw up a prototype preparedness plan of response to a catastrophic earthquake or the prediction of such an event in southern California. The plan, scheduled for completion late in 1981, should substantially improve preparedness for an earthquake or its prediction in that region and provide a model for other earthquake-prone areas of the country.

A copy of the NSC report is available at no cost from the *Federal Emergency Management Agency, Office of Public Affairs, 1725 I Street, N.W., Washington, DC 20472. (202) 634-6666.*

NOTICE

Due to the very large number of requests for copies of the pamphlet, *United Against Disaster* (described on page 7 of the December issue of the *Observer*), the Washington State Department of Emergency Services has exhausted its supply. Any further requests for the publication should be directed to *Labor Liaison, Federal Emergency Management Agency, Office of the Director, 1725 I Street, N.W., Washington, DC 20472.*





ON THE LINE

On the Line is a regular comment on a pertinent issue by a person who uses research findings in making or implementing policy. We invite responses to this column.

RECOVERY PLANNING: TOO LITTLE AND TOO LATE

In the last two years, the Academy for Contemporary Problems has developed two prototype training programs for the Federal Emergency Management Agency on planning long-term recovery from natural disasters, one dealing with riverine floods and the other with coastal flooding. Both programs feature simulated experience in disaster recovery decision making.

During the last four months we have also been operating the Natural Disaster Recovery and Mitigation Resource Referral Service, a clearinghouse designed to provide information to state and local practitioners to help them recover from a natural disaster quickly and to mitigate the effects of disasters on people and structures. Operating this service keeps us in contact with many state and local officials and other interested persons.

As a result of these experiences, I have a number of observations and opinions about the current status of recovery and mitigation programs.

- The *long-term* recovery process has not been given serious attention at any level of government. This is particularly true of the reconstruction period and land use problems.
- The quality of local preparedness plans generally leaves a great deal of room for improvement; they would benefit from more thorough analyses of local circumstances, more thoughtful operational planning, and a more farsighted perspective. Almost without exception, such plans fail to consider the recovery process. All levels of government should participate to raise the standards and the quality of results.
- Generally, the federal government and the states have provided little leadership, guidance, or support to localities for promoting long-term reconstruction which can result in community betterment. Instead,

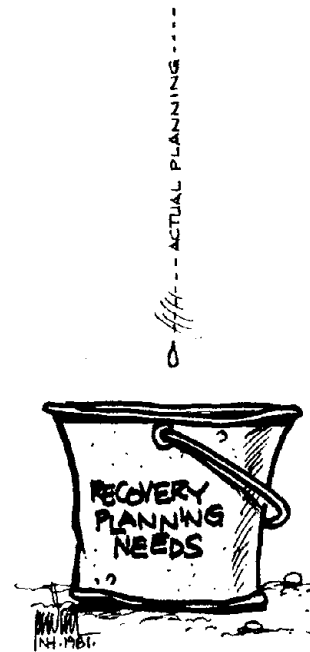
existing, often poor, practices are allowed to snap back into place after a disaster.

- Although the term "hazard mitigation" is used frequently, it is rarely explained in concrete, experiential terms or illustrated with specific instances so that state and local officials can understand and adopt such measures. It would be useful to have more case studies and examples that highlight what some states and communities have done to mitigate disaster losses.

A tremendous amount of work remains to be done to achieve truly comprehensive emergency planning and management capability at local, state and federal levels. There is a greater need for the application of existing research and experience than there is for original research, although both are necessary. Undeniably, this country must attend to improved education, training and technical assistance in order to achieve comprehensive emergency planning and management. Finally, I would like to see a proliferation of signs that read *The Buck Stops Here*.

Claire B. Rubin
The Academy for
Contemporary Problems

Note: The author's views are her own and not those of any sponsoring organization.



JOURNALS OF NOTE

Three publications of interest to *Observer* readers are currently available, and a fourth will come out in October. The *WMO Bulletin*, in its thirtieth year of publication, is the official organ of the United Nation's World Meteorological Organization. Issued quarterly in English, French, Russian and Spanish, the *Bulletin* features contributed articles on meteorological and climatological concerns, a world weather watch, notes on research and development, a calendar of upcoming events, and reviews. Of special utility are summaries published in the July and October issues of significant meteorological events in the preceding year. These discuss general circulation patterns and regional conditions. For further information or to subscribe (one year @24 Sw. fr., or about \$12.50), write *WMO Bulletin*, The Secretary-General, World Meteorological Organization, Case postale No. 5, CH-1211, Geneva 20, Switzerland.



Climatic Change, an interdisciplinary journal treating the description, causes and implications of climate change, has been published since 1977. Researchers in any germane discipline are invited to submit articles. Edited by Stephen H. Schneider of the National Center for Atmospheric Research, *Climatic Change* also has a book review section, invited editorials, partial proceedings of some meetings, and a section for letters to the editor. The private subscription rate for four issues is \$20.00; the institutional rate is \$41.00. Contact the *D. Reidel Publishing Company*, P.O. Box 17, 3300 AA Dordrecht, The Netherlands or Lincoln Building, 190 Old Derby Street, Hingham, MA 02043.

The islands of Japan are extremely vulnerable to a variety of natural hazards, and concern about the mitigation of these hazards among Japanese scientists and engineers is reflected in the recently published *Journal of Natural Disaster Science*. Contributions to the first two issues, brought out in 1980, are mostly technical reports treating hazards associated with earthquakes, landslides, ice and snow, tsunamis, floods, and frost. Sponsored by the Japanese Group for the Study of Natural Disaster Science, the Journal presents the results of research into areas such as 1) hard and soft disaster mitigation systems, 2) the prediction and probable maximum intensities of hazardous phenomena, and 3) the prediction of disasters due to man's development of the environment. Contributions are encour-

aged; the language of the journal is English. Single copies are \$9.00. Address inquiries about subscription rates and editorial policy to *Information Processing Center for Disaster Prevention Studies, Disaster Prevention Research Institute, Kyoto University, Gokasho, Uji, Kyoto Prefecture 611, Japan*.

Due to come out in October, *Earthquake Prediction Research* will be a quarterly forum for the publication of original papers, reports, and information related to earthquake prediction. Reviews of current research will be presented, as will case histories of predictions. The journal will also publish articles on anomalous animal behavior and socioeconomic effects of prediction, in addition to those on seismology and geophysics. *Earthquake Prediction Research* is edited by Tsuneji Rikitake of the Tokyo Institute of Technology. Four issues can be had for a private rate of \$35.00 or an institutional rate of \$65.00 from *D. Reidel Publishing Company*, P.O. Box 17, 3300 AA Dordrecht, The Netherlands or 190 Old Derby Street, Hingham, MA 02043. Subscriptions and inquiries from S.E. Asia and India should be sent to *Center for Academic Publications, Japan Scientific Societies Press, 2-10, Hongo 6-chome, Bunkyo-ku, Tokyo 113, Japan*.



NEW BIBLIOGRAPHY

Now available from the Information Center is *A Selected Bibliography on Disaster Planning and Simulation*, 1981, 36 pp., compiled by David Morton. The bibliography contains about 80 entries on articles, reports, books, periodicals and studies that deal with planning for natural disasters and with simulations useful in solving hazard problems. Although it covers all hazards, special sections are devoted to earthquakes, floods, and problems in coastal zones. The cost of the bibliography is \$2.00.





CONFERENCES

Planning Long-Term Recovery from Natural Disaster: The Coastal Setting, Federal Emergency Management Agency, The State of Texas and the State of Louisiana. Corpus Christi: March 24-27. This pilot workshop will simulate the problems created for state and local decision makers by a hurricane striking a multi-county area and causing widespread death and destruction. Participants will identify and resolve planning and management issues and conflicts that state and local officials would face during recovery from such a disaster. Inquiries about attending the workshop should be addressed to the coordinator, *Claire B. Rubin, The Academy for Contemporary Problems, 400 North Capitol Street, N.W., Suite 390, Washington, DC 20001, (202) 638-1445.*

Eighth International Symposium on Urban Hydrology, Hydraulics, and Sediment Control, University of Kentucky Water Resources Research Institute, College of Engineering, and College of Agriculture, American Society of Civil Engineers. Lexington, Kentucky: July 27-30, 1981. Control of urban stormwater runoff and sediment and the legal and socioeconomic implications of such control are among the issues to be raised at the symposium. Other topics of interest include quantification of rainfall, runoff, and sediment; hydraulics of urban drainage; and urban water distribution. Inquiries may be addressed to *Don J. Wood, Department of Civil Engineering, 206B Anderson Hall, University of Kentucky, Lexington, KY 40506, (606) 257-2936.* Paper abstracts, due December 29th, should be sent to *Elizabeth R. Haden, Coordinator, Office of Continuing Education, College of Engineering, University of Kentucky, Lexington, KY 40506, (606) 257-3971.*

Design of Prefabricated Concrete Buildings for Earthquake Loads, Applied Technology Council. Los Angeles, California: April 27-29, 1981. Experts on seismic-resistant construction from throughout the United States and three foreign countries will present papers discussing current technology and practices in the design of concrete buildings. Recommendations will be made for the application of present knowledge and for future research. Additional details are available from *Applied Technology Council, 2180 Shattuck Avenue, Suite 806, Berkeley, CA 94704, (415) 540-0223.*

Seventh European Congress on Earthquake Engineering, Technical Chamber of Greece and the European Association for Earthquake Engineering. Athens: September 6-11, 1982. The conference will examine such problems as rural housing in earthquake-prone areas, cost-benefit analysis in earthquake engineering, coordination of European research on earthquakes, resistance of structures and lifelines, and repairing and strengthening structures and monuments. Authors are invited to submit one-page paper abstracts, in English, by May 31, 1981. Further information is available from *C. A. Syrmakizis, Organizing Secretary 7-ECCE, Technical Chamber of Greece, 4, Karageorgi Servias str., Athens 125, Greece.*

Design of Prefabricated Concrete Buildings for Earthquake Loads, Applied Technology Council. Los Angeles, California: April 27-28, 1981. The goal of the seminar is to develop a resource document to improve seismic design criteria for prefabricated concrete buildings. Sixteen U.S. researchers will present papers on moment frames, precast wall systems, and diaphragms. Three papers by overseas authors will discuss the state-of-practice and code developments in Japan, New Zealand, and Yugoslavia. The two-day seminar is open to anyone interested in attending. For additional information, contact *Applied Technology Council, 2150 Shattuck Avenue, Suite 806, Berkeley, CA 94544, (415) 540-0223.*

River Basin Management: Canadian Experiences, Canadian Water Resources Association, Grand River Conservation Authority, and University of Waterloo. Kitchener-Waterloo, Ontario: October 4-7, 1981. Formal presentation of papers and informal discussions will focus on strategic issues in river basin management in Canada. Particular attention will be given to defining management problems, developing alternate solutions, implementing plans, and monitoring and evaluating the final solution. Information is available from *Bruce Mitchell, Department of Geography, University of Waterloo, Waterloo, Ontario N2L 3G1, (519) 885-1211.*

International Tsunami Symposium 1981, Tsunami Commission of the International Union of Geodesy and Geophysics. Sendai and Ofunato, Japan: May 25-29, 1981. Topics to be addressed at the assembly include sources of tsunamis, earthquake/tsunami interconnections, measurement and instrumentation, hydrodynamics, mitigation of tsunami hazards, and the socioeconomic effects of both tsunami risk and impact. For more information, contact *E. Kajiura, Earthquake Research Institute, University of Tokyo, Bunkyo-ku, Tokyo 113, Japan.*

International Invitational Workshop on Earthen Buildings in Seismic Areas, The University of New Mexico, INTERTECT, and the National Science Foundation. Albuquerque, New Mexico: May 24-28, 1981. The workshop will bring together domestic and foreign researchers and practitioners who will identify problems associated with adobe and other earthen buildings in seismic areas, determine the applicability of various aspects of seismic design to the construction of earthen buildings, explore possibilities for international technology transfer and cooperation, and describe gaps in research on seismic construction. Formal presentations and small group discussions will focus on topics such as the mechanical properties of adobe, structural behavior of earthen buildings, social and economic constraints to structure modification, and standards and codes for adobe construction. Further information may be had from *Gerald W. May, College of Engineering, Farris Center 107, University of New Mexico, Albuquerque, NM 87131, (505) 277-5521.*

Earthquakes and Earthquake Engineering: The Eastern U.S., Building Seismic Safety Council, Department of Energy, Earthquake Engineering Research Institute, and the Seismological Society of America. Knoxville, Tennessee: September 14-16, 1981. Engineers, geologists and seismologists will meet to examine the earthquake hazard and the threat it presents in the eastern United States. Special consideration will be given to defining ground motion, faulting, and tectonics; analysis and design of new facilities; evaluation of existing structures and establishing building codes and standards; and the socioeconomic implications for the affected regions. For more information, contact *Earthquakes and Earthquake Engineering, c/o Dr. James E. Beavers, Union Carbide Corp.—Nuclear Division, Bldg. K-1001, MS 194, P.O. Box P, Oak Ridge, TN 37830, (615) 574-9786.*

FLOOD MANAGEMENT LESSONS

The various techniques used in California to resolve conflicts typically encountered in managing flood plain uses are compiled in a comprehensive report recently issued as the California Department of Water Resources Bulletin #199, "California Flood Management: An Evaluation of Flood Damage Prevention Programs."

Nonstructural, rather than structural, solutions are emphasized for flood hazard mitigation. The publication, which is intended to be used as a tool by water resource planners in any region, includes information on:

- nonstructural and structural methods and programs used at all levels of government;
- beneficial uses of reservoir and bypass systems;
- an assessment of flood damage prevention in California by area, including the history of flooding, damage prevention studies, flood plain management, and flood protection needs;
- maps of each basin in the state, showing existing flood control projects and flood hazard areas; and
- pictures and descriptions of exemplary flood management projects.

To obtain a copy, write *The California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802. \$5.00. California residents add 6% sales tax.*





THE LONG, HOT SUMMER

At least 1,265 deaths in 26 states resulted from the 1980 heat wave, according to the National Oceanic and Atmospheric Administration's Center for Environmental Assessment Services (see *Observer*, Vol. V, No. 1, p. 9). Economic costs approximated \$20 billion, with increased energy consumption alone costing more than \$1.3 billion. Hundreds of miles of highways in the south central and midwestern states buckled in the heat; road damages in Illinois have topped \$100 million.

Corn, soybean and spring wheat crops were damaged by drought, the poultry industry lost millions of birds, and livestock growth slowed. Prices for raw agriculture products went up by 19% during July and August. Loss of vegetative cover on thousands of acres may exacerbate soil erosion. Water was in short supply, especially in Texas and Arkansas, and CEAS estimates that the drop in the water table far exceeded yearly normals in those two states and Oklahoma.

For more information, contact *CEAS/CIAD-CAB*, Page Building 1, Room 416, Washington, DC 20235, (303) 634-1822.

MAPS OUT

A five-color wall map, "Significant Earthquakes 1900-1979," has been published by the National Geophysical and Solar-Terrestrial Data Center and World Data Center A for Solid Earth Geophysics. Utilizing information from various world-wide and regional catalogs, the map shows the location and relative importance of 1,277 earthquakes. Earthquakes were included if there were ten or more deaths, if there was damage, or if the magnitude was at least $R7.5$.

On the bottom of the map, 682 destructive earthquakes are tabulated by time and date, latitude and longitude, focal depth, magnitude, number of deaths, and amount of damage. The full chart measures 42 x 54 inches, and is available for \$3.00 folded or \$5.00 in a

mailing tube from *NOAA, EDIS, NGSDC, D61, 325 Broadway, Boulder, CO 80303*.

The first comprehensive, multi-colored land use planning maps of an arid region have just been produced by the Arizona Bureau of Geology and Mineral Technology. The series of ten maps on the environmental geology of the McDowell Mountain area, Maricopa County, took four years of cooperative work with Arizona State University and the City of Scottsdale. The 24 x 36 inch maps are prepared at a scale of 1:24,000.

Developed as a tool for planners, engineers, public officials, developers and students, each map deals with specific elements of environmental geology: the geologic base map (A), landforms (B), land slopes (C), caliche (D), ground water (E), material resources (F), geologic hazards (G), excavation conditions (H), waste disposal (I), and construction conditions (J). The entire series sells for \$10.00; Maps A and B come as a set for \$2.50, and all maps are \$1.25 each. A 20% handling charge must accompany all mail requests. Order from the *Bureau of Geology and Mineral Technology, 845 North Park Avenue, Tucson, AZ 85719*.



RECENT PUBLICATIONS

NOTE: The publications listed below should be obtained from the author, organization or publisher cited. They are *not* available through the *Natural Hazards Observer*.

Drought in the Great Plains: Research on Impacts and Strategies. Norman J. Rosenberg, Editor. *Water Resources Publications*, P.O. Box 2841, Littleton, CO 80161. 1980. 200 pp. \$16.50.

This volume contains the proceedings of a workshop held in Lincoln, Nebraska March 26-28, 1979, sponsored by the National Science Foundation. Specialists from government, universities, industry, relief agencies, farming, business and the media met to assess current knowledge about drought in the Great Plains, to discuss the region's future vulnerability to drought, and to suggest specific research to improve drought mitigation. Included are reports on the social, economic and political aspects of drought management; drought prediction; and comparisons with droughts in other regions of the world.

Catalog of Tsunami Photographs. John B. Nelson. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data and Information Service. Key to Geophysical Records Documentation (KGRD) #13. 1980. 52 pp. \$3.00. Available from the National Geophysical and Solar-Terrestrial Data Center, NOAA/EDIS, Boulder, CO 80303.

The thirteenth publication in the KGRD series lists approximately 600 photographs of tsunamis and their destructive effects. The catalog contains over 80 examples of available photos and provides a price list for anyone wishing to obtain black and white or color prints, copy negatives, and transparencies. Nine tsunami events occurring during the years 1946-1975 are represented in the collection. Persons may request materials by either reviewing the captions or by specifying a location of interest, quality of photograph, or specific subject matter.

Barrier Island Handbook. Stephen P. Leatherman. National Park Service, Cooperative Research Unit and The Environmental Institute, University of Massachusetts at Amherst. 1979. 101 pp. \$3.25. Available from the Cape Cod National Seashore, P.O. Box 518, Eastham, MA 02642.

With the appearance of this handbook, both professional planners and the general public have access to another excellent guide to the dangers of tampering with the natural ecology of barrier islands. A clear explanation of beach and barrier island dynamics provides a foundation for an understanding of why development of the islands can precipitate an environmental disaster and pose a serious threat to human life and property. Although it is suggested that most barrier islands not be developed at all, any permitted development should be low-density, low-cost, and limited to those persons who will accept an inevitable capital loss without being provided with any form of compensation.

Assessment of Research and Practice in Australian Natural Hazards Management. Geoffrey Pickup and Joseph E. Minor. North Australia Research Bulletin #6. 1980. 207 pp. A \$6.00. Available from the North Australia Research Unit, P.O. Box 39448, Winnellie, Northern Territory, Australia.

This monograph reports the results of an assessment of natural hazards activities in northern Australia. Considering each significant hazard to which northern Australia is subject—drought, cyclone, flood, bushfire and earthquake—the authors outline the history, current knowledge, research in progress, and the risk posed by each to Australia. Behavioral aspects of natural disasters are examined briefly. Included is a review of the response of governments, the insurance and building industries, research institutions and emergency services organizations to natural hazards. Finally, the authors make recommendations to improve the effectiveness of hazards planning, technical programs and mitigation efforts in Australia.

Design and Construction Manual for Residential Buildings in Coastal High Hazard Areas. Prepared for the U.S. Department of Housing and Urban Development and the Federal Insurance Administration of the Federal Emergency Management Agency. 1981. 189 pp. Available free of charge from the Technical Assistance Division, Office of Natural Hazards Reduction and Evaluation, Federal Insurance Administration, Federal Emergency Management Agency, 1725 I Street, N.W., Washington, DC 20472.

The manual is intended for designers, builders, community officials and home owners who wish to build prudently and meet the requirements of the National Flood Insurance Program in areas of high hazard due to coastal flooding. The unique conditions found in coastal environments dictate the special design and construction recommendations made in the report. Besides providing background information on the NFIP and directing the reader to sources of further information, the manual reviews existing alternative approaches for building on raised foundations, recommends performance criteria for foundations in flood areas, and suggests some design solutions.

Flood Plain Land Use Management: An Analysis of Context, Programs and Impacts. Steven P. French. 1980. 181 pp. To obtain, contact Raymond J. Burby, Center for Urban and Regional Studies, The University of North Carolina at Chapel Hill, Hickerson House 067A, Chapel Hill, NC 27514.

This report discloses more results from a national study of flood plain management in over 1500 communities, begun over two years ago with funds from National Science Foundation (see *Observer*, Vol. V, No. 1, p. 5). This volume identifies important local characteristics which shape land use management programs and affect their impacts, discusses which land use management techniques are most effective, and suggests approaches best suited to various local circumstances. Among the findings of this analysis is that the management methods encouraged by the National Flood Insurance Program are effective in protecting future development from flood damage, but they are not effective in protecting existing development or natural areas. A recommendation is made for a more unified local, regional, state, and national management technique.

The Aftermath of Mt. St. Helens. Proceedings of a conference sponsored by Washington State University, July 8-9, 1980. 85 pp. \$7.00. Available from Water Research Center, Albrook Lab, Washington State University, Pullman, WA 99163, (509) 335-5531.

The conference provided a forum at which federal, state and local officials and researchers shared information on the effects of the volcano's eruption and on recovery efforts. Abstracts of about 30 presentations made at the conference are collected in the proceedings, as well as summaries of group discussions which were held on the final day. Topics covered include effects of the eruption on animals, birds, insects, plants and soils; damage to lakes and the Spokane River; lung and pulmonary risk studies; social impacts; particle exposure levels; and influences on agriculture.

Evacuation Behavior and Problems: Findings and Implications from the Research Literature. E. L. Quarantelli. The Ohio State University Disaster Research Center. 1980. 224 pp. \$5.00. Available from Librarian, Disaster Research Center, The Ohio State University, 128 Derby Hall, Columbus, OH 43210.

As the final report of a project which examined research on peacetime evacuation (see *Observer*, Vol. IV, No. 1, p. 8), this document sets out a model of evacuation behavior and describes what is known about each component of that model, i.e., the community context, threat conditions, social processes, patterns of behavior, and postdisaster consequences. Among the findings and recommendations are: 1) knowledge about evacuation is uneven since it has not been the focus of systematic study; 2) official planning for evacuation is often unrealistic and based upon incorrect assumptions and beliefs about the phenomenon; 3) evacuation should be visualized as a continuous process, with different stages requiring different plans; and 4) future research should focus on hitherto unexplored topics such as persons who refuse to leave their homes, evacuation of institutionalized populations, and the relationship between individual and organizational behavior during evacuation.

"Human Adjustment to the Risk of Environmental Extremes." Dennis S. Mileti. *Sociology and Social Research* 64 (April, 1980) 3:327-347.

In this paper, recent advances in research and theory by social scientists investigating environmental hazards are reviewed, and a typology of human adjustments to the risk of environmental hazards is presented. Current research on the specific factors which determine the adoption and implementation of risk-mitigation policies is employed as a basis for synthesizing a statement about how and why social systems adjust to the risk of future environmental disasters. A critique of the statement is offered which attempts to identify the knowledge gaps in disaster risk assessment that are preventing formation of a sound theoretical approach to disaster mitigation.

The Home Builder's Guide for Earthquake Design—Guideline 6. Orville Lee, Andrei Gerich, and Ronald Morony. U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Guideline HUD-PDR-565. 1980. 57 pp. \$3.75 (domestic). \$4.70 (foreign). Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock #023-000-00629-4.

Following the 1971 San Fernando earthquake, HUD's Office of Policy Development and Research analyzed the damage to single-family residences and published its findings in a detailed 594-page document entitled *A Methodology for Seismic Design and Construction of Single-Family Dwellings* (HUD-PD&R-248-1). Due to its length, the *Methodology* has been condensed into a more manageable format which still provides commercial builders and individuals with suggestions for avoiding the problems and damage discovered in San Fernando. Most of the publication is given to architectural details accompanied by explanatory text. In addition, there is a brief discussion of why certain types of construction are better suited than others to resist earthquake forces.

The Impact of Nonstructural Flood Abatement Measures on Patterns of Industrial Location. Daniel D. Singer and Jonathan W. Kohn. U.S. Department of the Interior, Office of Water Research and Technology. 1980. 123 pp. Paper copy: \$12.50. Microfiche: \$3.50. Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Stock #PB 80-202 526.

This study investigates whether locating a manufacturing facility in a flood plain reflects a lack of information, management error, historical accident, or irrational behavior. Using the hydrologic and economic characteristics of the Susquehanna River Basin as a data base, a new method for estimating flood damages is proposed which provides an alternative to current methods that are biased in favor of structural, as opposed to nonstructural, mitigative measures. Conclusions drawn from the study indicate that 1) existing flood damage abatement systems in the Susquehanna Basin rely excessively on structural measures, 2) a greater use of nonstructural measures would be desirable, and 3) local use of nonstructural measures will reduce the real damages associated with industrial land use in the flood plain.

An Annotated Bibliography of Coastal Zone Management Work Products. George W. Robertson, et al. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Coastal Zone Management, 1980. 391 pp. A limited number of single copies may be obtained free of charge from Katherine Jameson, Coastal Zone Information Center, 3300 Whitehaven Street, N.W., Washington, DC 20235, (202) 634-4255.

This publication is a compilation of state, territory, and federal work products produced with funds from the Coastal Zone Management Act of 1972, as amended. It updates an earlier OCZM bibliography published in 1976 and contains approximately 1500 citations, adding 422 new entries to the previous edition. Improvements have been made in the format, and a key word index using 105 descriptors has been added to facilitate use of the bibliography. Descriptors identify products ranging from oil pollution and coastal aesthetics to natural hazards. Listed among the products are more than 40 bibliographies.

Emergency Preparedness and Security Measures: Guidelines, Policies, and Procedures for Financial Institutions. Richard C. Rescorla. Prepared for the Bank Administration Institute's Security Commission. 1978. 82 pp. \$14.00. Order from Keith Marshall, Bank Administration Institute, 303 South Northwest Highway, Park Ridge, IL 60068, (312) 693-7300.

This manual defines the total range of threats against the banking community, including natural hazards, fire, nuclear attack, burglary, civil disorders and extortion attempts. It recommends actions to take in response to each emergency, and outlines how the bank should prepare itself for such events. Chapters are devoted to assessing risks, establishing organizational responsibility for emergency preparedness, developing a plan for emergency operations, training employees and rehearsing proper responses to crises, and evaluating the emergency plan after it has been tested. A list of pertinent references is included.

Environmental Hazards and Community Response: The Santa Barbara Experience. G. Wesley Johnson and Ronald L. Nye, Editors. *Public Historical Studies Monograph #2*. 1979. 393 pp. \$6.00. Available from the Department of History, University of California, Santa Barbara, CA 93106. Make checks payable to University of California Regents.

Growing out of a graduate research seminar in public history, this thorough volume assesses how the community of Santa Barbara has planned for, and responded to, disasters. Four hazards are examined with respect to how the situation came about and developed over time: the great earthquake of 1925; drought and water supply problems in the last century; the oil spill of 1969 which affected not only Santa Barbara, but the whole nation; and wildfires which pose an increasing risk. This is one of the few studies in recent years that takes a historical view of hazard adaptation and response, and it illuminates community response in a broader time frame than is frequently available.

"Mandating Local Government Emergency Services." Adam Rose. *The Urban Interest* 2 (Spring, 1980) 1:65-73.

The article examines the role of federal mandates to local governments in the provision of emergency services, especially during disasters. The author classifies emergency services as merit goods—those goods which must be provided by the public sector because normal market supply will not meet actual needs—and thus finds emergency services legitimately subject to mandates. The author discusses the current reliance on mandates for emergency service provision, alternative means of intergovernmental interaction and policy implications for provision of emergency services under the centralized Federal Emergency Management Agency. Directions are suggested for economists and political scientists for future studies of mandating.

Use of U.S. Geological Survey Earth-Science Products by Selected Regional Agencies in the San Francisco Bay Region, California. W. J. Kockelman. U.S. Department of the Interior, Geological Survey, USGS Open-File Report #79-221. 1979. 170 pp. Paper copy: \$35.50. Microfiche: \$3.50. Available from the USGS, Open-File Services Section, Branch of Distribution, Box 25425, Federal Center, Denver, CO 80225.

An inventory of seven selected regional agencies in the Bay Area was made to determine the use of over 100 earth-science products prepared as part of the San Francisco Bay Region Environment and Resources Planning Study. Over 50 regional agency officials and employees were also asked to indicate problems with the products and to suggest improvements. Suggestions to ensure more effective use of earth-science information included 1) monitoring and analyzing new state or federal laws and regulations in order to anticipate regional information needs, 2) giving priority to areas affected by development, 3) providing maps at the larger scale and greater detail needed by regional agencies, and 4) releasing earth-science information faster and according to a formal distribution pattern.

State Water Conservation Planning Guide. U.S. Water Resources Council, 1980. 108 pp. Available free of charge from the U.S. Water Resources Council, 2120 L Street, N.W., Washington, DC 20037.

This guide, intended for use by the states in promoting the efficient use of water resources, describes how to develop water conservation programs and explains the application procedures for obtaining water conservation planning grants. It summarizes federal, state, regional and local policies, programs and experience; describes procedures for integration of water conservation planning into state water management efforts; and, through an extensive bibliography, directs the reader to additional information useful in the planning process.

Wisconsin's Shore Erosion Plan: An Appraisal of Options and Strategies. Roger Springman and Stephen M. Born. Wisconsin Department of Administration, Office of Coastal Management, 1979. 177 pp. For availability of the report, contact Al Miller, Coastal Program Manager, Wisconsin Department of Administration, Madison, WI 53702.

During the years in which Wisconsin began its participation in the federally funded coastal management program, Lakes Michigan and Superior were at record high levels. Extensive shore erosion was causing millions of dollars of damage and, as a consequence, it was consistently ranked as a high priority concern of riparian property owners and local government officials. The findings of this document provided a basis for the Wisconsin Coastal Management Council's adoption of a 12-part action strategy designed to improve the coastal regulatory process and to initiate procedures for shoreland zoning and hazard disclosure. In addition, it provides a factual foundation from which local communities and state agencies can select an appropriate management response tailored to fit each organization's specific needs.

Human Response to Volcanic Eruption: Mt. St. Helens, May 18, 1980. Ronald W. Perry, Marjorie R. Greene, and Michael K. Lindell. 1980. 145 pp. Copies are available at no cost from Battelle Human Affairs Research Centers, 4000 N.E. 41st Street, P.O. Box C-5395, Seattle, WA 98105.

A follow-up volume to an earlier one (see *Observer*, Vol. V, No. 2, p. 6) on perceived risk before Mt. St. Helens erupted, this report, prepared with funds from the National Science Foundation, examines knowledge and behavior at the time of the disaster, May 18th. Two communities near the mountain were selected for intensive study: the Toutle/Silver Lake area, and the town of Woodland. Individuals were surveyed with respect to which of the volcano's hazards they thought most dangerous, how they decided to undertake (or not) protective actions, and what elements of the local emergency plan enhanced their adaptive response to eruption warnings. The final chapter identifies important components of effective emergency preparedness planning in a rural area.

The NATURAL HAZARDS RESEARCH AND APPLICATIONS INFORMATION CENTER is intended to strengthen communication between research workers and the individuals, organizations, and agencies concerned with public action relating to natural hazards. Please let us know of any research or research needs or other information which should be brought to the attention of the Center. The Center is funded by the Corps of Engineers, the Federal Emergency Management Agency, the National Oceanic and Atmospheric Administration, and the U.S. Geological Survey, acting through the National Science Foundation.

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